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Research

The Relationship Between COVID-19 Anxiety and Preoperative Anxiety during the Pandemic

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Aims: The aim of this study was to determine the relationship between COVID-19 anxiety levels and preoperative anxiety in patients who will undergo elective surgery during the pandemic period.

Methods: This study was an analytical cross-sectional study. The study was carried out with 228 patients between May and December 2021 in the surgical clinics of a training and research hospital. The data were collected using patient information form, Coronavirus Anxiety Scale (CAS) and Amsterdam Preoperative Anxiety and Information Scale (APAIS).

Findings: The patients’ APAIS total score level was 15.86 ± 6.44, and the CAS score was 6.63 ± 3.61. A positive, moderate and statistically significant relationship was found between the CAS score and the APAIS total score (r = 0.547; P = .000) and, the CAS score and anxiety due to anesthesia surgery (r = 0.545; P = .000) and information (r = 0.501; P = .000) sub-dimensions.

Conclusions: The results of this study showed that the preoperative anxiety level increased in individuals with increased coronavirus anxiety levels.

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Keywords: Covid-19 anxiety, preoperative anxiety, Coronavirus Anxiety Scale (CAS)
Research Questions

The research questions of this study were:

1. What is the COVID-19 anxiety and preoperative anxiety of surgical patients?
2. Do the descriptive characteristics of surgical patients affect their Coronavirus Anxiety Scale (CAS) and Amsterdam Preoperative Anxiety and Information Scale (APAIS)?
3. Is there a relationship between CAS and APAIS?

Methods

Design

This analytical cross-sectional study was conducted in the surgical clinics of Aksaray Training and Research Hospital between May and December 2021.

Sampling and Setting

No sample selection was made in the study. Patients (N = 398) were approached to participate in the study and 228 met criteria. Inclusion criteria for the study were determined as individuals who are 18 years of age or older, literate, do not have a psychiatric disease, do not use psychiatric drugs, hospitalized for at least one day before and after surgery, and can speak Turkish and agree to participate in the study. Exclusion criteria from the study; were determined as individuals who were scheduled for emergency surgery and were diagnosed as psychotic, using anxiety medications.

Measures

This study data were collected using the patient identification form, the Coronavirus Anxiety Scale (CAS) and the Amsterdam Preoperative Anxiety and Information Scale (APAIS). The data of the study were collected in patient rooms in the clinic before surgery. The forms took about 10 to 15 minutes to fill out.

Patient Information Form

This form contained information about the sociodemographic characteristics of patients who underwent elective surgery.

Coronavirus Anxiety Scale

The CAS was developed by Lee et al.14 to identify the possible level of anxiety associated with the COVID-19 crisis. The scale is in five-point likert type with a total of five questions and a one-dimensional scale. Scoring of the scale was evaluated as 0 (never), 1 (Rarely, less than one or two days), 2 (A few days), 3 (more than 7 days) and 4 (almost every day in the last two weeks). A total CAS score of nine or above indicates coronavirus-related dysfunctional anxiety.14 Bicer et al.15 conducted a Turkish validity and reliability study. The Cronbach’s alpha value of the CAS was 0.832.16 The Cronbach’s alpha value in this study was calculated as 0.890.

Amsterdam Preoperative Anxiety and Information Scale (APAIS)

The APAIS was developed by Moerman et al.15 in 1996 to evaluate preoperative anxiety. The Turkish validity and reliability of the scale was performed by Cetinkaya et al.16 The scale is divided into six items and two subscales investigating three aspects of preoperative anxiety. The subscale consists of fear of anesthesia and surgery (items 1, 2, 4, and 5) and need for information (items 3 and 6). Each question is evaluated with a five-point Likert scale, where a value of one is considered “not at all alarming” and a value of five “quite alarming.” Higher scores indicate higher levels of anxiety and desire for information. Cronbach’s α-coefficients of the APAIS anxiety and information requirement subscales were 0.897 and 0.786, respectively.16 In this study the Cronbach’s alpha value APAIS anxiety and information requirement subscales were 0.874 and 0.798, respectively.

Ethical Considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki. Before starting the research, written permission was obtained from the Aksaray University Human Research Ethics Committee (protocol no: 2020/08-08) and the institution where the research was conducted. All participants were informed about the purpose and design of the study and their consent was obtained.

Data Analysis

Statistical analyses were performed using the SPSS (IBM SPSS Statistics 24) package program. Mean and percentage statistical values were used to interpret the findings. The Mann-Whitney U test was used to compare the measurement values of two independent groups with the data that did not have normal distribution, and the Kruskall-Wallis test ($\chi^2$-table value) was used for the comparison of three or more independent groups. Spearman correlation coefficient was used to examine the relationships of two quantitative variables that do not have a normal distribution.

Results

Information on the descriptive characteristics of the patients is given in Table 1. In the study, the largest percentage of participants were in the 18 to 44 age group (n = 79, 34.6%). The majority of the patients were female (n = 113; 50.4%), 183 (80.3%) were married, 143 (62.7%) were primary school graduates and 123 (53.9%) had previous surgery. In addition, 135 (59.2%) of the patients did not have a chronic disease, 138 (60.5%) did not have a regular medication, and 145 (63.6%) had a fear of surgery.

The patients’ APAIS total score level was 15.86 ± 6.44, and the CAS score was 6.63 ± 3.61. The comparison of the mean scores of the

| Variable                     | n  | %   |
|------------------------------|----|-----|
| Age (mean ± SD = 51.31 ± 18.02) |    |     |
| 18-44                        | 79 | 34.6|
| 45-54                        | 36 | 15.8|
| 55-64                        | 52 | 22.8|
| ≥65                          | 61 | 26.8|
| Gender                       |    |     |
| Female                       | 115| 50.4|
| Male                         | 113| 49.6|
| Marital status               |    |     |
| Married                      | 183| 80.3|
| Single                       | 45 | 19.7|
| Education level              |    |     |
| Primary education            | 143| 62.7|
| High school                  | 58 | 25.4|
| Associate degree             | 27 | 11.9|
| Surgery experience           |    |     |
| Yes                          | 123| 53.9|
| No                           | 105| 46.1|
| Chronic disease              |    |     |
| Yes                          | 93 | 40.8|
| No                           | 135| 59.2|

(continued)
### Table 1 (Continued)

| Variable                                      | n  | %  |
|-----------------------------------------------|----|----|
| The state of using medication for any disease |    |    |
| Yes                                           | 90 | 39.5 |
| No                                            | 138| 60.5 |
| Clinic                                        |    |    |
| Orthopedics                                   | 105| 46.1 |
| Urology                                       | 47 | 20.6 |
| Cardiovascular surgeon                        | 14 | 6.1 |
| Brain surgeon                                 | 13 | 5.7 |
| General surgery                               | 22 | 9.6 |
| ENT (Ear–Nose–Throat)                        | 7  | 3.1 |
| Plastic surgery                               | 17 | 7.5 |
| Eye surgery                                   | 3  | 1.3 |
| Fear of surgery                               |    |    |
| Yes                                           | 145| 63.6 |
| No                                            | 83 | 36.4 |

SD, standard deviation.

All values are expressed as number (percentage) or mean ± standard deviation.

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### Table 2

Comparison of APAIS and CAS Mean Scores According to Some Descriptive Characteristics of the Participants (N = 228)

| Variable                                      | APAIS ± S.D. | APAIS Median [IQR] | CAS ± S.D. | CAS Median [IQR] |
|------------------------------------------------|--------------|--------------------|------------|------------------|
| Age 18-44                                      |              |                    |            |                  |
| Yes                                           |              |                    |            |                  |
| Yes                                           | 8.39 ± 1.08  | 5.0 [2.0]          | 0.45 ± 0.75| 5.0 [2.0]        |
| No                                            | 1.45 ± 0.90  | 5.0 [2.0]          | 0.86 ± 0.9 | 4.0 [2.0]        |
| Gender                                        |              |                    |            |                  |
| Male                                          |              |                    |            |                  |
| Yes                                           | 8.77 ± 1.36  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| No                                            | 8.41 ± 1.20  | 5.0 [2.0]          | 1.67 ± 1.3 | 5.0 [2.0]        |
| Education level 2                             |              |                    |            |                  |
| Primary education                             |              |                    |            |                  |
| Yes                                           | 8.23 ± 0.89  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| No                                            | 8.46 ± 1.10  | 5.0 [2.0]          | 1.67 ± 1.3 | 5.0 [2.0]        |
| Chronic disease 3                             |              |                    |            |                  |
| Yes                                           | 8.47 ± 0.88  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| No                                            | 8.59 ± 1.09  | 5.0 [2.0]          | 1.67 ± 1.3 | 5.0 [2.0]        |
| Clinic                                        |              |                    |            |                  |
| Orthopedics                                   |              |                    |            |                  |
| Yes                                           | 8.38 ± 1.14  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| No                                            | 8.59 ± 1.10  | 5.0 [2.0]          | 1.67 ± 1.3 | 5.0 [2.0]        |
| Urology                                       |              |                    |            |                  |
| Yes                                           | 8.34 ± 0.97  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| No                                            | 8.45 ± 1.10  | 5.0 [2.0]          | 1.67 ± 1.3 | 5.0 [2.0]        |
| Cardiovascular surgeon                        |              |                    |            |                  |
| Yes                                           | 8.47 ± 0.90  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| No                                            | 8.59 ± 1.09  | 5.0 [2.0]          | 1.67 ± 1.3 | 5.0 [2.0]        |
| Brain surgeon                                 |              |                    |            |                  |
| Yes                                           | 8.42 ± 0.95  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| No                                            | 8.59 ± 1.09  | 5.0 [2.0]          | 1.67 ± 1.3 | 5.0 [2.0]        |
| General surgery                               |              |                    |            |                  |
| Yes                                           | 8.69 ± 0.97  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| No                                            | 8.45 ± 1.09  | 5.0 [2.0]          | 1.67 ± 1.3 | 5.0 [2.0]        |
| ENT (Ear–Nose–Throat)                         |              |                    |            |                  |
| Yes                                           | 8.79 ± 1.10  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| No                                            | 8.35 ± 0.95  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| Plastic surgery                               |              |                    |            |                  |
| Yes                                           | 8.47 ± 0.90  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |
| No                                            | 8.49 ± 1.09  | 5.0 [2.0]          | 1.56 ± 1.2 | 5.0 [2.0]        |

APAIS and CAS according to the descriptive characteristics of the patients is given in Table 2.

According to the APAIS total score averages (P > .05), there was no statistically significant difference between age, marital status, education level, and the state of using medication for any disease. However, there was a statistically significant difference between APAIS total score and gender, presence of chronic disease, clinical and preoperative fear (P < .05).

According to the CAS total score averages (P > .05), there was no statistically significant difference between age, gender, marital status, education level, presence of chronic disease, continuous drug use and clinical. However, there was a statistically significant difference between CAS total score and preoperative fear (P < .05).

A positive, moderate and statistically significant relationship was found between the CAS score and the APAIS total score and sub-dimensions (P < .05). As the CAS scores increase, the scores of the APAIS total score, anesthesia-surgery anxiety, and information request sub-components increase (Table 3).

APAIS, Amsterdam Preoperative Anxiety and Information Scale; CAS, Coronavirus Anxiety Scale; IQR, interquartile range; SD, standard deviation.

* Mann-Whitney U test (Z-table value) statistics for comparison of three or more independent groups.

1 Mann-Whitney U test (Z-table value) for comparison of measurement values of two independent groups in data not having normal distribution.
Table 3
Examining the Relationships Between APAIS and CAS Scale (N = 228)

|                      | APAIS          | Anxiety due to anesthesia surgery | Information |
|----------------------|----------------|-----------------------------------|--------------|
| APAIS                |                |                                   |              |
| Correlation (r)      | 0.547          | 0.545                             | 0.501        |
| p                    | 0.000          | 0.000                             | 0.000        |
| APAIS, Amsterdam Preoperative Anxiety and Information Scale; CAS, Coronavirus Anxiety Scale.
* Spearman correlation coefficient was used to analyze the relationships between two quantitative variables that do not have a normal distribution; Statistical significance \( P < .05 \).

Discussion
Most patients awaiting surgery experience anxiety, which is widely accepted as an expected response. If the patient’s fear of surgery is high, the individual may experience physical symptoms such as heart palpitations, nausea and chest pain. Surgical intervention and type of anesthesia have an important place among the causes of preoperative anxiety. Matthias et al. determined anxiety levels as and type of anesthesia have an important place among the causes of preoperative anxiety.18

Matthias et al.19 determined anxiety levels as 15.60 ± 7.08 in APAIS, and Saracoğlu et al.20 stated that the anxiety level was 15.26 ± 5.41 in the APAIS, and in the study of Karadağ Arı,21 the APAIS anxiety level was 15.8 ± 5.9. In this study, the mean APAIS anxiety level was found to be 15.86 ± 6.44, which is consistent with the literature. The results show that patients experience moderate anxiety about anesthesia and surgery.

In this study, we identified four factors affecting patients’ anxiety scores. These are gender, the patient’s presence of chronic disease, the patient’s clinical and preoperative anxiety. There are studies showing that the anxiety level of women is higher than men in the preoperative period.19,21 and that the level of preoperative anxiety is higher in male patients.22 In this study, female APAIS scores were found to be higher than male patients. The presence of chronic disease can increase the anxiety level of patients. In the literature, the rate of preoperative anxiety is higher in patients with chronic disease than in those without.23,24 In this study, the APAIS value of individuals with chronic diseases was found to be high, in line with the literature. A determinant of clinical preoperative anxiety can be defined as patients who are hospitalized for surgery. In a previous study, the anxiety levels of the patients varied according to the clinics (orthopedics, urology and ENT clinic) that the patients were hospitalized.21 In the current study, the level of anxiety differs according to the clinics where the patients were hospitalized, and there is a significant difference between the APAIS scores between the orthopedics and urology clinics. All diseases that require surgical intervention affect individuals physically, psychologically and socially, and cause preoperative anxiety.19,25 In this study, individuals who experienced fear before surgery experienced more anxiety than individuals who did not experience fear.

The COVID-19 pandemic has created a serious etiological, global problem that affects every aspect of life and disrupts the social structure. Individuals experience varying levels of psychological distress during pandemics, and this is commonly seen in the form of fear, stress, sleep disturbances, and anxiety.26 Among the most important problems in this pandemic period are the knowledge of the patients who plan to undergo surgical intervention, their fear levels, and the relationship between the data on surgical treatment and care processes and their COVID-19 fear levels. Worry about infection with COVID-19 during hospitalization is a strong factor for the level of preoperative anxiety. Hospitalization carries a high risk of transmission of COVID-19, as the pandemic hospitals continue their normal functioning and care for patients with COVID-19. For this reason, fear of COVID-19 transmission during hospitalization can cause intense anxiety in patients in the preoperative period.12,27 Balkaya et al.28 stated in their study that the preoperative anxiety level of patients who have fear of being infected with the coronavirus is high. In another study conducted in patients with liver transplantation, as the fear of COVID 19 increased, patients avoided crowded environments, public transportation, and visits to the doctor for examination.9 In the current study, the APAIS scores of patients with high coronavirus anxiety levels at hospitalization were high. The level of anxiety of patients before surgery can be affected by many factors. COVID-19 is one of the factors affecting this anxiety. Informing patients about the surgery 16,27, and COVID-19 measures can be effective in reducing the anxiety levels of patients.12

Limitations
This study has some limitations. First, the data were limited to the surgical clinics of a hospital. Therefore, it limits the generalization of the results to all patients undergoing elective surgery. Second, measures of anxiety were limited by the scale tool, and detailed causes of COVID-19 anxiety were not evaluated in this study.

Conclusion
The results of this study showed that the preoperative anxiety level increased in individuals with increased coronavirus anxiety levels. Nurses play a vital role in assessing the factors affecting the patient’s preoperative anxiety to care for and support the patient before surgery. Clinical nurses should evaluate patients in the clinic in terms of fear, anxiety and stress levels. The first of the recommendations within the scope of the research findings is that the patients should be evaluated in terms of fear and anxiety before the surgery and appropriate service delivery should be planned considering their individual suitability. Secondly, it is necessary to reduce the anxiety level of the patients in the preoperative period with use of information for the patients, or complimentary methods such as, aromatherapy, massage, music.

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