

# Measuring depression and anxiety level and determining concerns regarded to pandemic in doctors and nurses working in operating room

Anxiety and depression level of health care workers in the operating room

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## Abstract

**Aim:** One of the most important conditions for healthcare professionals to work efficiently during the pandemic is to ensure complete physical and mental well-being. This study was planned to measure the depression and anxiety levels of nurses and doctors working in the operating room during the COVID-19 pandemic, and to determine the causes of anxiety related to the pandemic.

**Material and Methods:** This study is a cross-sectional, descriptive and region-stratified survey study. This study was conducted with operating room nurses and doctors who volunteered to participate. Participants were administered a survey consisting of 13 questions that questioned the reasons for concern about COVID-19 in addition to the Beck Anxiety Scale and Beck Depression Scale.

**Results:** There was no difference between doctors and nurses regarding anxiety and depression symptoms. Anxiety level was higher in men. Depression and anxiety levels were high in those who worked for sixteen years and over, while depression and anxiety levels were significantly lower in the 18-35 age group. The most worrisome situation for healthcare professionals was the possibility of working in a unit where they had never worked before. The working area that the participants considered the most risky one in relation to COVID-19 was the emergency operating room.

**Discussion:** We observed that participants showed mild depression symptoms and moderate anxiety. Also, psychological conditions of the younger participants were better.

## Keywords

Depression, Anxiety, COVID-19, Pandemic, Healthcare workers

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Introduction

COVID-19 disease has spread rapidly, affecting the world and becoming a global public health problem [1]. COVID-19 may progress without any symptoms or with mild symptoms such as fever, cough, sore throat, shortness of breath, fatigue and weakness. On the other hand, severe symptoms such as pneumonia, acute respiratory distress syndrome, and multiple organ dysfunction, and even death may be seen [2,3]. The high mortality, morbidity and transmission rate of the disease have led to various precautions in many countries [1,4]. During the pandemic, to prevent COVID-19 transmission, while the entire population is urged to stay at home and even some sanctions are applied, on the contrary, healthcare professionals have to work in an extremely risky environment in hospitals. Additionally, they may become physically and mentally tired due to reasons such as increased workload, the need to work in different areas unfamiliar to them, difficulties of working with protective equipment, the need for triage of patients, and anxiety about not being able to access protective equipment [5-7]. The loss of physical and mental health of healthcare workers reduces work efficiency and makes the fight against COVID-19 even more difficult [7]. This situation reveals that the mental health of healthcare workers should be protected as well as their physical health [5,6]. In order to develop approaches to protect the mental and physical health of healthcare professionals, first of all, the problems experienced during the pandemic should be determined and solution strategies should be developed based on these problems. In particular, healthcare workers who are in direct contact with patients, such as operating room nurses and doctors, may be at risk for both COVID-19 and psychological problems. This study aims to determine the depression and anxiety levels of nurses and doctors working in the operating room during the pandemic and the causes of anxiety associated with COVID-19.

Material and Methods

This study is a descriptive, cross-sectional, region-stratified and multi-center survey study. This study was carried out between 10.5.2020 and 30.6.2020 with nurses and doctors working in the operating room who were volunteered to participate in the study. Permission was obtained from the Izmir Public Health Directorate and the Local Ethics Committee. In this study, we included the operating room doctors and nurses from 5 hospitals serving in the province of Izmir and accepting COVID-19 patients. The participants consisted of surgeons from all branches, anesthesiology and reanimation specialists and all nurses working in the operating room. In order to collect study data, we sent the survey link we prepared to the participants via e-mail and asked the participants to fill in the survey online. The principal investigator examined the survey results and excluded participants who filled the survey incompletely or incorrectly. The survey included the Beck Anxiety Index (BAI), Beck Depression Scale (BDS), socio-demographic characteristics of the participants and a survey consisting of 13 questions prepared to determine the reasons for concern about COVID-19. In order to identify these questions, first we questioned 50 healthcare professionals working in our hospital about their concerns regarding COVID-19 by asking open-ended questions. Later,

we prepared our 13-question questionnaire based on the most common answers to these questions. Operating room nurses and doctors who volunteered to participate were enrolled in the study. The 21-question Turkish validity and reliability study of BAI was conducted by Ulusoy, Şahin and Erkmen (1998) and the Turkish version was found to be valid and reliable. The scale measures the degree of anxiety symptoms experienced by an individual. Each item on the scale is scored between 0 and 3 according to the intensity of the experienced symptom. A score between 0 and 63 can be obtained on the scale. A high score indicates the severity of the anxiety. On the scale, 8-15 points indicate mild, 16-25 points indicate moderate, and 26-63 points indicate severe anxiety.8 BDI, the other scale used, was developed by Beck et al. in 1979 and is a 21-question scale that questions how a person feels over the previous week. The validity and reliability study of the BDI was performed by Hisli (1989) and was found to be valid and reliable.9 On the scale, each question can be scored between 0 and 3 points, with 0-16 points indicating mild depressive symptoms, 17-29 points- moderate, and 30-63 points- severe depressive symptoms.10 Data, recruited from online survey results were analyzed using IBM SPSS 25 program for Windows. For descriptive statistics, the median ± IQR was given for numerical variables, and number and percentage values were given for categorical variables. As a result of the Kolmogorov- Smirnov test, it was understood that the data did not show a normal distribution, and the Mann-Whitney U test was used for comparison of two independent groups, and the Kruskal-Wallis test was used for comparison of three or more independent groups. Bonferroni Correction was used to obtain appropriate p-value for pairwise comparison of groups, performed to find out which variable caused the difference in multi-group comparison. Statistical significance was accepted as  $p < 0.05$ .

Results

Among 528 participants, 256 (48.5%) were men and 272 (51.5%) were women. The mean age of the participants was  $41.17 \pm 7.178$  years, 284 (53.8%) were nurses and 244 (46.2%) were doctors. The BDS mean score of the participants was  $16.47 \pm 13.741$  and the BAI mean score was  $21.73 \pm 12.161$ . The demographic characteristics of the participants are presented in Table 1. The reasons for participants' concerns about COVID-19 are presented in Table 2. When we compare the BAI and BDS scores in terms of descriptive data of the participants, we found that there was a significant difference between these inventories in terms of age, department where the participant worked, and work experience of the volunteer (Table 3). According to post-hoc analysis, the difference in BAI score between the departments where the participants worked was associated with significantly higher anxiety scores of the participants working in the obstetrics and gynecology department, and the difference in BDS was associated with significantly lower depression scores of those working in the anesthesia and reanimation department (Table 3). We observed that the difference between age groups in BAI was caused by the 18-34 age group, and the anxiety scores of the participants in the 18-34 age group were significantly

lower. In Beck depression, a significant difference was found among all age groups. While the lowest depression score was in the 18-34 age group and the highest was in the 50-64 age group, we observed that the depression score increased as the age increased. We observed a significant difference in BAI among the groups determined according to the participants' work experience. The difference was associated with the group of 16 years and above, which is significantly higher than all other groups. For BDS, this difference arises from the 1-5 years group, whose depression score is lower than the other groups,

Table 1. Demographic data of the participants

|                  |                                               | N   | %    |
|------------------|-----------------------------------------------|-----|------|
| Gender           | Female                                        | 272 | 51.5 |
|                  | Male                                          | 256 | 48,5 |
| Occupation       | Nurse                                         | 284 | 53.8 |
|                  | Doctor                                        | 244 | 46.2 |
| Department       | Anesthesia and reanimation                    | 40  | 7.6  |
|                  | Neurosurgery                                  | 50  | 9.5  |
|                  | General Surgery                               | 144 | 27.3 |
|                  | Ophthalmology                                 | 28  | 5.3  |
|                  | Obstetrics and gynecology                     | 73  | 13.8 |
|                  | Otolaryngology                                | 41  | 7.8  |
|                  | Orthopedics and traumatology                  | 73  | 13.8 |
|                  | Plastic, reconstructive and aesthetic surgery | 58  | 11   |
|                  | Urology                                       | 21  | 4.0  |
| Chronic diseases | No                                            | 482 | 91.3 |
|                  | Diabetes mellitus                             | 2   | 0.4  |
|                  | Hypertension                                  | 2   | 0.4  |
|                  | Respiratory disease                           | 8   | 1.5  |
|                  | Diabetes mellitus and Hypertension            | 18  | 3.4  |
|                  | Respiratory disease and Hypertension          | 16  | 3.0  |
| Having children  | No                                            | 134 | 25.4 |
|                  | Yes                                           | 394 | 74.6 |

Table 2. Presentation of participants' concerns about COVID-19

|                                                                                                          | Yes<br>N (%) | No<br>N (%) |
|----------------------------------------------------------------------------------------------------------|--------------|-------------|
| 1. I'm afraid of being COVID-19                                                                          | 324(61.4)    | 204(38.6)   |
| 2. I believe that if I get COVID-19, I can be treated and overcome the disease                           | 304(57.6)    | 224(42.4)   |
| 3. I am afraid of not seeing the relatives I left behind if I get COVID-19                               | 376(71.2)    | 152(28.8)   |
| 4. I am afraid of being COVID-19 and infecting my relatives                                              | 384(72.7)    | 144(27.3)   |
| 5. I worry that I will not be able to access personal protective equipment when necessary                | 150(28.4)    | 378(71.6)   |
| 6. I am afraid of being COVID-19 no matter how well I am protected                                       | 324(61.4)    | 204(38.6)   |
| 7. Even if a patient does not have COVID-19, I am still worried about attending that patient's surgery   | 402(76.1)    | 126(23.9)   |
| 8. Even if the patient does not have COVID-19, I always use personal protective equipment during surgery | 170(32.2)    | 358(67.8)   |
| 9. I believe the vast majority of patients have COVID-19                                                 | 270(51.1)    | 258(48.9)   |
| 10. I'm afraid of not being able to get tested when necessary                                            | 220(41.7)    | 308(58.3)   |
| 11. I'm worried that my personal needs will not be met if I get COVID-19                                 | 296(56.1)    | 232(43.9)   |
| 12. I'm worried about having to work in another department that I have never worked before               | 432(81.8)    | 96(18.2)    |
| 13. I'm afraid of not being able to access up-to-date information on COVID-19                            | 116(22)      | 412(78)     |

Table 3. Comparison of participants' BAI and BDS scores according to descriptive data

|                             |                                               | Number<br>(%) | BAI<br>score<br>Median<br>(IQR) | P<br>value | BDS<br>score<br>Median<br>(IQR) | P<br>value |
|-----------------------------|-----------------------------------------------|---------------|---------------------------------|------------|---------------------------------|------------|
| Gender                      | Female                                        | 272(51.5)     | 21(18)                          | 0.021*     | 12.5(17)                        | 0.941      |
|                             | Male                                          | 256(48.5)     | 24(20)                          |            | 13(18)                          |            |
| Age                         | 18-34                                         | 90(17.0)      | 12(11)                          | 0.000*     | 6(6)                            |            |
|                             | 35-49                                         | 364(68.2)     | 24.5(19)                        |            | 14(19)                          | 0.000*     |
|                             | 50-64                                         | 78(14.8)      | 23(12)                          |            | 17(15)                          |            |
| Presence of children        | No                                            | 134(25.4)     | 17(25)                          | 0.007*     | 12(15)                          | 0.406      |
|                             | Yes                                           | 394(74.6)     | 23(19)                          |            | 13 (17)                         |            |
| Occupation                  | Nurse                                         | 284(53.8)     | 22.5(19)                        | 0.670      | 12.5(19)                        | 0.541      |
|                             | Doctor                                        | 244(46.2)     | 22(20)                          |            | 13(16)                          |            |
|                             | Anesthesia and reanimation                    | 40(7.6)       | 20(15)                          | 0.000*     | 6(10)                           | 0.024*     |
|                             | Neurosurgery                                  | 50(9.5)       | 27(17)                          |            | 11.5(26)                        |            |
| Department                  | General surgery                               | 144(27.3)     | 21(20)                          |            | 14(23)                          |            |
|                             | Ophthalmology                                 | 28(5.3)       | 23(28)                          |            | 16.5(14)                        |            |
|                             | Obstetrics and gynecology                     | 73(13.8)      | 26(12)                          |            | 16(18)                          |            |
|                             | Otolaryngology                                | 41(7.8)       | 17(17)                          |            | 14(10)                          |            |
|                             | Orthopedics and traumatology                  | 73(13.8)      | 21(20)                          |            | 11(13)                          |            |
|                             | Plastic, reconstructive and aesthetic surgery | 28(11)        | 22.5(16)                        |            | 12(15)                          |            |
|                             | Urology                                       | 51(4)         | 25(23)                          |            | 18(30)                          |            |
|                             | 1.5                                           | 42(8)         | 14(18)                          | 0.000*     | 4(4)                            | 0.000*     |
|                             | 6.10                                          | 54(10.2)      | 12(16)                          |            | 9(8)                            |            |
| Work experience             | 11.15                                         | 92(17.4)      | 16(11)                          |            | 8.5(14)                         |            |
|                             | 16 and over                                   | 340(64.4)     | 25(15)                          |            | 16.5(23)                        |            |
| Presence of chronic disease | Yes                                           | 482(91.3)     | 23(18)                          | 0.223      | 15 (14)                         | 0.298      |
|                             | No                                            | 46(8.7)       | 22(20)                          |            | 12 (18)                         |            |
| Smoking                     | Yes                                           | 442(83.7)     | 22(23)                          | 0.683      | 13 (13)                         | 0.324      |
|                             | No                                            | 86(16.3)      | 22(19)                          |            | 12 (18)                         |            |
| Alcohol use                 | Yes                                           | 300(56.8)     | 23(19)                          | 0.254      | 12.5 (19)                       | 0.414      |
|                             | No                                            | 228(43.2)     | 21.5(20)                        |            | 13 (17)                         |            |

\*p<0.05, BAI: Beck anxiety inventory, BDS: Beck depression scale, Mann-Whitney U test and Kruskal- Wallis test were used

and the 16 years and above group with higher depression scores than the other groups. The vast majority of the participants (21%) stated that the emergency operating room was the most risky working area in terms of COVID-19, while Orthopedics and Traumatology were the least risky.

Discussion

Despite all the difficulties, healthcare professionals are fighting COVID-19 with extraordinary effort and determination. However, this struggle not only exhausts healthcare workers, but also puts their physical and mental health in serious danger [11-13]. Given that COVID-19 will remain a serious health crisis, healthcare professionals will need to maintain a high alert state for a long time. The negative effects of the pandemic on the psychology of healthcare workers will make it more difficult for healthcare workers to fight the disease. We planned this study to determine the depression and anxiety levels of nurses and

doctors working in the operating room during the pandemic, and the causes of anxiety related to the pandemic. A total of 528 doctors and nurses participated in this cross-sectional and regional stratified study. According to the literature, healthcare workers struggling with infectious diseases experience certain psychological problems. Studies conducted during the previous acute respiratory syndrome (SARS) epidemic have shown that the epidemic negatively affected healthcare workers [14,15]. In a training hospital in Southern Taiwan, 17.3% of 135 healthcare workers who came into contact with patients with suspected SARS during the SARS epidemic developed significant mental symptoms [14]. In a study conducted in Toronto, new psychological problems were observed in 5% of healthcare workers after the SARS epidemic in Toronto [15]. Studies conducted during the COVID-19 pandemic show that psychological problems such as anxiety, depression and insomnia are common among healthcare workers [16,17]. While it was stated that mental health symptoms were high among healthcare workers treating COVID-19 patients in China, 50.4% of the participants reported symptoms of depression and 44.6% of them reported symptoms of anxiety [17]. A study conducted in China showed that during the COVID-19 epidemic, nearly half of healthcare workers experienced anxiety and depression, and more than half had general psychological problems [16]. In this study, we found that the doctors and nurses who took care of patients in the operating room diagnosed with COVID-19 showed mild symptoms of depression and experienced moderate anxiety. Nurses and doctors were similar in terms of anxiety level and depression symptoms. The anxiety and depression scores of the participants in the 18-34 age group were significantly lower than in other age groups, and the 50-64 age group had the highest depression score. The reason for this was thought to be the increase in morbidity and mortality with increasing age for COVID-19.

There is evidence in the literature suggesting that the female gender is a risk factor for depression and anxiety [18,19]. According to the results of this study, while the level of anxiety was higher in men compared to women, there was no statistical difference in terms of the symptoms of depression. Considering the results of our study, higher anxiety levels in men may be associated with the pandemic, but this should be supported by further studies.

Having contacts with COVID-19 patients while working, witnessing the physical pain and death of patients, increased workload, anxiety caused by working in a new department, they are not used to, fear of not being able to provide effective care, anxiety about inadequate medical equipment, the possibility of transmitting the diseases to other people, the fear of being stigmatized by others if they are caught with COVID-19, the need to wear uncomfortable protective equipment can expose healthcare workers to intense stress and affect negatively their psychology [13, 20-22]. Most of the nurses and doctors who participated in this study stated that even if the patient did not have COVID-19, they were still worried, they thought that they would be caught with COVID-19, no matter how careful they were, they were afraid of transmitting the disease to their relatives if they become infected with COVID-19 and they were

afraid of not seeing their relatives. While the rate of those who were afraid of not having access to protective equipment and up-to-date information was low, a high percentage (81.8%) of the participants were worried about being assigned to a new field unfamiliar to them. Nearly half of the participants were worried about not being able to get tested for COVID-19, and more than half of them worried that their needs would not be met if they got the disease.

Previous studies show that healthcare professionals who are directly involved in the diagnosis, treatment and care of COVID-19 patients show higher symptoms of depression and experience higher anxiety [17,23]. On the contrary, in this study, although the anxiety level of healthcare workers working in the area of Anesthesia and Reanimation was the same as in other units, depression scores were lower than those working in other departments. The reason for the lower depression level of the participants working in anesthesia and reanimation was attributed to the fact that those working in this department received more frequent training, became aware of current information earlier, and were more experienced in protecting methods, as they worked in intensive care units and provided care and treatment to more COVID-19 positive patients than others. We think that the significantly higher anxiety level of the health care workers in the Obstetrics and Gynecology department may be due to the fact that there are more emergency cases such as cesarean section in this department, and this issue should be investigated.

The majority of the participants in the study stated that the emergency operating room was the most risky working area in terms of COVID-19. This was followed by anesthesia and reanimation, neurosurgery, respectively. Orthopedics and traumatology, general surgery, gynecology and obstetrics were reported as the ones with the lowest risk, respectively. Looking at this result, we think that the suspense caused by the impossibility of testing for COVID-19 before emergency surgeries and the concern that the surgeries involving the head and neck region are close to the patient's respiratory tract cause healthcare professionals to think that these surgeries are more risky.

Various practices such as meeting the basic needs of healthcare professionals, providing social support, open communication, clarity in job description, flexible working hours, and the ability to benefit from psychological help without fear of being stigmatized by others will have a positive psychological effect on healthcare professionals [11,20]. Considering the results of this study, we see that the need to work in a department where they have not worked before is the leading cause of concern of healthcare workers regarding pandemic. Additionally, fear of getting COVID-19, fear of not being able to see their relatives and fear of not reaching personal protective equipment are among other common concerns about pandemic among healthcare professionals.

This study has some limitations. Firstly, a new scale could be developed measuring the anxiety and depression level of healthcare workers regarding the pandemic. But in this study, we just aimed to determine concerns about COVID-19. Maybe further studies can be performed to develop a scale. In addition,

although there are non-pandemic reasons that play a role in anxiety and depression, these reasons were not included in the study.

Conclusion

Our findings reveal that doctors and nurses working in the operating room have mild depression symptoms and moderate anxiety. We see that the compulsory changes made in the distribution of healthcare workers in health institutions and in the new tasks defined for healthcare workers due to the pandemic, the difficulties experienced while working, and the anxiety they feel for their families are among the causes of concerns about the pandemic. These concerns may be the cause of anxiety and depression in healthcare workers. Thus, it can be said that taking measures such as training healthcare professionals on crisis management, providing the necessary psychological support for healthcare workers and improving the working conditions of healthcare workers will prevent the deterioration of the psychological status of healthcare workers in cases such as a pandemic and increase work efficiency.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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