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Summary
Anxiety Predictors in COVID-19 Pandemic: Comparison between Healthcare and Other Professions

Duygu Kaba
Başkent Üniversitesi

Zulal Törenli Kaya[1]
Başkent Üniversitesi

Burcu Akın Sarı
Başkent Üniversitesi

Hande Ayraler Taner
Başkent Üniversitesi

Gamze Özçürümez Bilgili
Başkent Üniversitesi

The Coronavirus 2019 (Covid-19) outbreak, which started in China in December 2019 has spread rapidly in many countries and was declared as a pandemic by the World Health Organization on March 11, 2020 (WHO, 2020). In pandemics, just as the virus that causes the disease spreads among individuals and affects the whole society; it has been observed that the mental health problems have also spread rapidly as a symbolic infection due to the uncertainty of threat (Kaniasty, 2019), misinformation by the media and other communication channels, and panic at the individual and mass level (Khan & Huremović, 2019). For this reason, in the management of the outbreak, intervention to the anxiety, fears, misinformation, and attitudes of society are as vital as is treating the disease (Holmes, 2008; Vaughan & Tinker, 2009).

In the pandemic period, having insufficient equipment and intense working hours under a high risk of contamination, social isolation, stigmatization, and insufficient psychosocial support are among the underlying risk factors for healthcare professionals' mental health problems (Kang et al., 2020). Simultaneously, as in past outbreaks, healthcare professionals had concerns about carrying the infection to their families, and this brought them an extra mental burden (e.g., Maunder et al., 2020). In Turkish literature, regarding healthcare workers' psychological states related to COVID-19 pandemic, it was found that a high level of depression (77.6%), anxiety (60.2%), insomnia (50.4%) and psychological distress (76.4%) were highly common; and being a woman, working at the forefront and having a psychiatric history were the risk factors for mental health problems (Şahin, Aker, Şahin, & Karabekiroğlu, 2020). In the study of Hacimusalar, Kahve, Yaşar, and Aydin (2020) it was revealed that the healthcare workers' levels of hopelessness and state anxiety were higher; the nurses' level of hopelessness was significantly higher than physicians and their state anxiety levels were higher than both physicians and other healthcare workers; as the income level decreased, the participants' levels of hopelessness and state anxiety increased.

In addition to risk factors, the protective factors for mental health were examined and it was shown that preventive behaviors against COVID-19 had a positive effect on psychological well-being. Regarding this subject, Yıldırım, Geçer and Akgül (2021) reported that avoiding public transportation and frequent hand washing was frequently adopted, and women who perceived higher risk and fear due to the virus, reported more preventive behaviors. The authors stated that those who believed that they were vulnerable to the disease and perceived a high risk of infection were more likely to engage in preventive behaviors, because these behaviors helped them develop the sense of control on COVID-19.

Based on the literature, this study aimed to examine the anxiety levels of healthcare professionals, compare anxiety levels of healthcare and non-healthcare professions, and investigate the predictors of compliance with anxiety and disease preventive behaviors, in the early stage of the Covid-2019 outbreak in Turkey.

Method

Participants

This study included participants from various professions such as healthcare professionals, engineers, lawyers, teachers, and tradesmen. The participants were graduates of Baskent University and they are living in different cities in Turkey. The study consisted of 1389 participants (healthcare professionals: n = 568, 40.9%; other professionals: n = 821, 59.1%). According to post-hoc analysis conducted using G*Power 3.1 (Faul, Erdfelder,

Address for Correspondence: [1]Asst. Prof. Zulal Törenli Kaya, Başkent University, Faculty of Medicine, Bahçelievler / Ankara
E-mail: ztorenli@baskent.edu.tr

Buchner, & Lang, 2009), the sample sizes in each group were found sufficient based on the sampling error of .05, an effect size of .32 (*Hedges' g*) and the power of .99.

Instruments

The online survey consisted of a 29-item information form, which was prepared by researchers that obtained information about the participants' demographic characteristics, preventive behaviors, perceived risk and level of knowledge about COVID-19, and the GAD-7 scale.

Information form.

i. Demographic characteristics. This part included twelve questions related to sociodemographic characteristics, the presence of chronic diseases, and work attendance state.

ii. Preventive behaviors for COVID-19. In this part of the questionnaire, the preventive behaviors recommended for all, namely; "washing hands frequently, using sanitizer, avoiding crowded places" were asked in the form of three "yes/ no" questions.

iii. Perceived risk of COVID-19. In this part, the participants' perceived risk of COVID-19, perceived risk of being infected with COVID-19 due to their professions, anxiety for infecting their family members, and the feeling of desperation toward COVID-19 were asked with four items rated on a 10-point Likert type scale (*0 = none, 10 = very severe*). Based on the cut-off score, the scores were categorized as low (0–5) or high (6–10) risk/ anxiety/ desperation. The Cronbach's alpha of the items was found as .71.

iv. Level of knowledge about COVID-19. To assess the participants' level of knowledge, eight "true/ false" statements regarding the characteristics of COVID-19 were presented.

Generalized Anxiety Disorder-7 (GAD-7). GAD-7 is a 7-question self-report 4-point Likert-type scale (*0 = never, 1 = several days, 2 = more than half the days, 3 = nearly every day*) developed by Spitzer, Kroenke, Williams, and Löwe (2006) according to the DSM-IV-TR diagnostic criteria. It evaluates the symptoms of generalized anxiety disorder within the last two weeks. Cut-off scores of 5, 10, and 15 are considered for mild, moderate, and severe anxiety, respectively. The Turkish adaptation study was conducted by Konkan, Şenormancı, Güçlü, Aydin, and Sungur (2013) in which the cut-off score was found as 8, and Cronbach's alpha as .85. In present study the Cronbach's alpha was found as .92. In this study, Cronbach's alpha was found as .92

Procedure

This study was approved by the Institutional Review Board (Project no: KA20/121). All instruments were installed on an online survey program (i.e, Google forms). During the data collection process, the research was conducted using an online questionnaire via the e-mail and social media accounts of a university's alumni association. The data collection period was between 20th March 2020 and 25th March 2020. In the survey, an informed consent form and the researchers' contact information were presented to the participants before the questions. The inclusion criteria for the participants were determined as living in Turkey and being over the age of 18. Everyone who received the link to the online questionnaire and volunteered to participate included in the study. The participants were notified about the aims of the study, the importance of their participation, and their right to refuse or quit the survey at any time during the process. The fulfillment of the survey took approximately five minutes.

Data Analysis

All the analyses were performed via IBM SPSS (Statistical Package for the Social Sciences) software. To determine whether there is a normal distribution, an inspection of histograms was evaluated with multivariate skewness and kurtosis. After performing descriptive statistical analysis, to evaluate the differences between the groups, an independent sample t-test, and Pearson's chi-square tests were conducted. For the homogeneity of variances, independent sample t-test results were interpreted based on Levene statistics. Bonferroni-corrected paired comparison method was used for post hoc analysis of chi-square test results. The correlations between the variables and anxiety levels were examined through Pearson's and Spearman's correlation coefficients.

In order to test the factors predicting anxiety and compliance with preventive behaviors, logistic regression analyses were performed. These analyses were performed based on the cut-off score of GAD-7, and the compliance with all preventive behaviors. In these regression analyses, the variables that revealed significant differences in terms of independent sample t-test and Pearson's chi-square test results were included in the models. Before the analyses, the assumptions were tested. In logistic regression analysis, the "Enter" method was chosen. In all analyses, a significant difference was accepted based on $p < .05$.

Results

The Relation between Demographic Characteristics and Anxiety Levels

This study included 1389 eligible individuals whose median age was 36.7 with an interquartile range (IQR) of 19–77 years. Of the 1389 people, 894 were (64.4%) females, 495 (35.6%) were males, and 40.9% (n

= 568) are healthcare workers, 59.1% (n = 821) are from other professions. While 76.8% of healthcare workers are physicians, 10% are nurses, and 13.2% other health personnel (midwives, pharmacists, technicians, etc.), 33.4% of non-health workers are engineers, 13.8% of them were teachers, and the rest had other professions such as shopkeepers, lawyers and bankers.

In this study, it was observed that 18.3% of the healthcare workers had normal/minimal level of anxiety, 32.6% had mild anxiety, 22.9% had moderate anxiety and 26.2% had severe anxiety. However, in non-healthcare workers, these rates were 27.8%, 35.8%, 21.9%, and 14.5%, respectively. The relation between professionals and anxiety levels was examined using an independent sample t-test, and it was found that the anxiety levels of healthcare professionals (M = 10.16, S = 5.96) were significantly higher than those who were non-healthcare workers (M = 8.18, S = 5.34), $t(1129.93) = -6.33$, $p < .001$. In contrast, there were no statistically significant differences in anxiety levels among healthcare professionals in the ANOVA analysis, $F(2, 565) = 1.40$, $p = .101$). Besides, when we compared the healthcare professionals to the non-healthcare professionals, the perceived risk of COVID-19 (χ^2 (1, N = 1389) = 143.22, $p < .001$), the perceived risk of being infected with COVID-19 due to their professions (χ^2 (1, N = 1389) = 209.65, $p < .001$), the anxiety for infecting family members, (χ^2 (1, N = 1389) = 20.11, $p < .001$) and feeling of desperation towards COVID-19 (χ^2 (1, N = 1389) = 15.33, $p < .001$) were significantly higher in the healtcare workers.

To determine the potential risk factors of anxiety, the participants were divided into paired groups according to demographic data. The differences between the GAD-7 mean scores of the groups were evaluated using the independent sample t-test. Accordingly, the anxiety levels of the participants who are under the age of 36 were significantly higher than those who are older ($t(1296.29) = 3.96$, $p < .001$). In this study, similar to the literature findings, it was found that women were more anxious than men ($t(1053.91) = -10.87$, $p < .001$) and participants who had at least one child were more anxious than those who had no children ($t(1387) = -1.99$, $p < .05$).

We also investigated the relationship between anxiety and going to work despite the 'stay home' warning. As a result, 73.3 % of those included in the study were working outside the home. When the anxiety levels of the participants were compared based on their working status, GAD-7 levels were found to be significantly higher in those who had to go to work than those working from home (t (1366.58) = -5.07, $p < .001$).

Of the 1389 participants, 292 (21%) reported that they had at least one chronic disorder. However, there was no statistically significant difference in GAD-7 levels used to compare anxiety levels between those with and without the chronic disease t (1387) = .59, p = .55.

The Relation between Demographic Characteristics and Compliance with Preventive Behaviors Against COVID-19

A total of 1327 participants (95.5 %) reported that their hygiene habits have changed. Regarding commonly preferred preventive behaviors for COVID-19, the great majority of the participants were washing their hands frequently (n = 1249, 89.9 %), while 79.8 % (n = 1109) were using sanitizer, and 74.6 % (n = 1036) were avoiding crowded places. The relationship between demographic characteristics and compliance with these three preventive behaviors was evaluated by Pearson's chi-square analysis. According to analysis, compliance with all preventive behaviors was significantly higher in the participants who were healthcare professionals (χ^2 (1, N = 1389) = 6.07, $p < .05$), who continue to go to work (χ^2 (1, N = 1389) = 20.76, $p < .001$), who perceived COVID-19 as high risk (χ^2 (1, N = 1389) = 8.10, $p < .01$), who had a high level of the anxiety for infecting family members, (χ^2 (1, N = 1389) = 16.48, $p < .001$), or who had a feeling of desperation toward COVID-19 (χ^2 (1, N = 1389) = 10.84, $p < .01$). According to the anxiety level, there was no significant difference between the groups in terms of compliance with the preventive behaviors ($\chi 2$ (1, N = 1389) = 1.50, p = .22).

In the study, to determine the relation between COVID-19 knowledge level and anxiety, and between COVID-19 knowledge level and compliance with protective behaviors ANOVA test and chi-square test were used, respectively. There was no significant relation between knowledge level and anxiety (F (3, 1385) = .38, p = .77), but the difference between the level of COVID-19 knowledge and the compliance to protective behaviors was found to be statistically higher (χ^2 (3, N = 1389) = 11.87, $p < .01$). We used the Bonferroni corrected method ($p < .0125$) for post-hoc analyzes and it was determined that this difference was due to the group's correct answer to all questions (χ^2 (1, N = 1389) = 9.56, p = .002).

The Factors Predicting Anxiety and Behavioral Compliance

The first model in which we analyzed the predictors of anxiety explained 20.3% (Cox and Snell R^2) to 27.1% (Nagelkerke R^2) of the variance related to anxiety. The results for multivariable logistic regression analysis revealed that the predictors of anxiety were found as age (B = .47, $Wald$ (1) = 11.80, $p < .01$, Exp (B) = 1.59, 95% CI = [1.22, 2.08]), gender (B = .91, $Wald$ (1) = 44.13, p

< .001, Exp (B) = 2.47, 95% *CI* = [1.89, 3.23]), having at least one child (*B* = .39, *Wald* (1) = 7.81, *p* < .01, Exp (B) = 1.47, 95% *CI* = [1.12, 1.93]), the anxiety for infecting family members (*B* = .55, *Wald* (1) = 11.46, *p* < .01, Exp (B) = 1.73, 95% *CI* = [1.26, 2.39]), and feeling of desperation towards COVID-19 (*B* = .1.46, *Wald* (1) = 109.92, *p* < .001, Exp (B) = 4.31, 95% *CI* = [3.28, 5.67]). Among these variables, the strongest predictor of anxiety was detected as the feeling of desperation toward COVID-19.

The other defined regression model determining the factors of predicting compliance with the preventive behaviors could explain a small part of the variance [%3.3 (Cox and Snell R^2) - 4.5% (Nagelkerke R^2], $\chi^2 = 46.50$ [(6)], $p < .001$. In this analysis, it was determined that the working status (*B* = .46, *Wald* (1) = 12.25, *p* < .001, Exp (B) = 1.58, 95% *CI* = [1.22, 2.04]), the anxiety to infect family members (*B* = .39, *Wald* (1) = 7.14, *p* < .01, Exp (B) = 1.48, 95% *CI* = [1.11, 1.97]) and the level of knowledge about COVID-19, (*B* = .38, *Wald* (1) = 9.92, *p* < .01, Exp (B) = 1.46, 95% *CI* = [1.15, 1.86]), predicted the individual's compliance with the preventive behaviors.

Discussion

In recent studies conducted in China by using the GAD-7 scale, the anxiety prevalence of healthcare professionals was reported between 24% and 44.7% (Lai et al., 2020; Zhang et al., 2020; Zhu et al., 2020). In this study, the anxiety prevalence of healthcare professionals was found as 62.9% (95% OR 58.7 - 66.8). Moreover, it was found that being a healthcare professional was not a risk factor for anxiety, despite their higher anxiety prevalence compared to China. It would be suggested that this finding could be the consequence of performing the present study at the early stage of the COVID-19 pandemic in Turkey.

Consistent with the findings, Wang et al. (2020) suggested that in terms of anxiety levels, women are three times riskier than men in the COVID-19 pandemic. In addition to their higher depression and health anxiety levels (Özdin & Özdin, 2020), increased workload due to housework and childcare (Power, 2020) and being exposed to violence at home (Akel et al., 2021) were among the reasons for women's high level of anxiety in the pandemic.

The feeling of desperation is associated with stress, anxiety, and depression (Garlow et al., 2008). In this study, it was found that among the criteria predicting anxiety, the highest rate belonged to the feeling of desperation. Similarly, Yıldırım and Arslan (2020) also emphasized the relation between hope and psychological well-being during the early stage of the COVID-19 pandemic. Studies have also reported that the most relevant situation for individuals who attempt suicide was a feeling of desperation (Hendin, Maltsberger, Haas, Szanto, & Rabinowicz, 2004). Suicide rates in the elderly increased during the SARS epidemic in Hong Kong in 2003-2004 (Cheung, Chau, & Yip, 2008). In addition to mental disorders, especially during the pandemic, an increase in suicide risk can be observed due to financial difficulties, domestic violence, and misinformation shared through social media. However, suicide risk may be higher in healthcare professionals who are more likely to encounter the disease, due to feelings of desperation (Gunnell, Appleby, Arensman, Hawton, & John, 2020). For this reason, it will be life saving to include mental health practices related to suicide prevention in pandemic intervention programs (Klomek, 2020). Therefore, the Ministry of Health and non-governmental organizations have promoted early intervention programs for healthcare professionals and for the general population in Turkey.

Another remarkable finding was that, although it explained a small part of the variance, the level of knowledge predicted compliance with preventive behaviors. This result emphasized that correctly informing society about the virus is to be important for the campaign against COVID-19 infection.

Upon our knowledge, this is one of the rare studies comparing healthcare professionals with other professions in the early COVID-19 pandemic process in Turkey, when information about the disease is limited and changing constantly. The predictors of anxiety were found as age, gender, having children, anxiety for infecting family members, and feeling of desperation. With the progress of the pandemic, the concerns of healthcare professionals and society will also change. From this perspective, it will be informed about what should be considered in the early stages of the next pandemics to provide psychological intervention.

The results of the present study should be evaluated within some limitations. First, this study includes all the limitations of an online survey. Also, the cross-sectional design of the study prevents the establishment of a definite cause-effect relationship between the variables. Another limitation of this study is that the feeling of desperation is not evaluated with a standardized measure. Finally, since women are more likely to participate in such surveys, in the final sample the number of women was approximately twice as many men. These limitations should be taken into consideration for future studies.