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and Related Factors

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Anxiety and Depression Levels of Healthcare Professionals During the COVID-19 Pandemic and Related Factors

COVID-19 Pandemisi Sırasında Sağlık Çalışanlarının Anksiyete ve Depresyon Düzeyleri ve İlişkili Faktörler

ABSTRACT
Objective:
The aim of this study is to investigate the anxiety and depression levels of healthcare professionals during the COVID-19 pandemic and related factors.

Material and Methods:
The study group involved the doctors and nurses working in hospitals where COVID-19 patients were treated. An online questionnaire was used to assess the anxiety and depression levels and associated factors. The questionnaire consisted of a socio-demographic section, Beck Depression Inventory (BDI), and State-Trait Anxiety Inventory (STAI).

Results:
A total of 446 healthcare professionals participated in the study. The depression, state, and trait anxiety scores were clinically significant in 18.6%, 60.5%, and 69% of the participants, respectively. Being a woman, a nurse, prolonged exposure to COVID-19 news, and lack of physical exercise were associated with higher anxiety scores. We also observed that younger age, lack of physical exercise, prolonged exposure to COVID-19 news and a history of mental illness prior to the pandemic increased the levels of depression and/or anxiety in healthcare professionals.

Conclusion:
Healthcare professionals face with high risk for impairment in psychological well-being during the COVID-19 pandemic. The low rate of admissions for mental illnesses despite high rates of anxiety and depression symptoms in our study suggests that the psychological support needs of healthcare professionals should be taken into account during the pandemic.

Key Words:
COVID-19 pandemic, Healthcare professionals, Anxiety, Depression

ÖZ
Amaç:
Bu çalışmanın amacı, COVID-19 pandemisinde sağlık çalışanlarının anksiyete ve depresyon düzeyleri ve ilişkili faktörleri araştırmaktır.

Gereç ve Yöntemler:
COVID-19 pandemisinde sağlık çalışanlarının anksiyete ve depresyon düzeylerini ve ilişkili faktörleri değerlendirmek için çevrimiçi bir anket kullanıldı. Çalışma, COVID-19 hastalarının tedavi edildiği hastanelerde çalışan doktor ve hemşireleri içeriyordu. Anket sosyo demografik veriler, Beck Depresyon Envanteri (BDE) ve Durumluk-Sürekli Kaygı Ölçeği'nden (DSKÖ) oluşuyordu.

Bulgular:
Çalışmaya toplam 446 sağlık çalışanı katıldı. Katılımcıların % 18,6' sı klinik olarak anlamlı sayılan depresyon puanlarına, % 60,5'i klinik olarak anlamlı sayılan durumluk anksiyete ve % 69,0' ı sürekli anksiyete puanlarına sahipti. Kadın olmak, hemşire olmak, COVID-19 yayınlarına uzun süreli maruz kalmak ve fiziksel egzersiz yapmamak, daha yüksek anksiyete puanları ile ilişkilendirildi. Bu çalışmada, COVID-19 pandemisinde daha genç yaşta olmanın, fiziksel egzersiz yapmamanın, uzun süreli COVID-19 yayınlarına maruz kalmanın ve pandemiden önce ruhsal bir hastalığa sahip olmanın, COVID-19 pandemisinde sağlık çalışanlarında depresyon ve / veya anksiyete riskini arttırdığı saptanmıştır.

Sonuç:
COVID-19 pandemisi sırasında sağlık çalışanları ruhsal iyilik hallerinin bozulması açısından risk altındadır. Çalışmamızdaki anksiyete ve depresyon belirtilerinin oranları ve bu oranlara rağmen ruhsal sıkıntı nedeniyle doktor başvurusundaki oranların azlığı pandemi sırasında sağlık çalışanlarının psikiyatrik destek ihtiyaçlarının dikkate alınması gerekliliğini kanıtlamaktadır.

Anahtar Kelimeler:
COVID-19 pandemisi, Sağlık çalışanları, Anksiyete, Depresyon

INTRODUCTION

In December 2019, many pneumonia-like cases of unknown cause emerged in Wuhan, China, and then the causative agent was determined to be a new type of coronavirus (1). The novel coronavirus has been named SARS-CoV-2, and the disease it caused as 'COVID-19' by the International Committee on Taxonomy of Viruses (2). COVID-19, which transmits as an airborne infection, has rapidly spread to other countries and has been declared a pandemic by the World Health Organization (3). It is predicted that the COVID-19 pandemic would continue to affect the mental health of society in the future as it is at present (4). Also, it has been reported that healthcare professionals working with probable or definite COVID-19 patients in the hospitals are more vulnerable to experiencing mental problems. Thus, this group of workers has a high risk for developing a stress response against being in close contact with the SARS-CoV-2, being exposed to traumatic situations such as death from COVID-19, and making difficult decisions during the disease (5,6).
Stress causes mental problems, such as anxiety, depressive symptoms, insomnia, denial, and anger, leading to disruptions in the fight against COVID-19. Stress may also affect attention

and comprehension skills, as well as produce long-term effects on the general well-being of employees. Therefore, it is important to protect and support the mental health of healthcare professionals for both effective pandemic containment and the long-term well-being of the population (7).
Studies on the mental well-being of healthcare workers during the COVID-19 pandemic are still in progress (8,9).
The aim of this study was to investigate the effects of the COVID-19 pandemic on the mental well-being of healthcare workers and related factors.

MATERIAL and METHODS
Study sample:
This cross-sectional study was conducted with the doctors and nurses working in the city of Samsun hospitals, where COVID-19 patients were treated/followed up. The healthcare professionals were informed about the study and the voluntary basis of participation. The participants in the study remained anonymous. Institutional ethics committee approval from Ondokuz Mayıs University was obtained (OMU KAEK 2020/335, 12.05.2020).

Study protocol:
The questionnaire that consisted of three sections was sent to the healthcare professionals using online sources. The introduction part of the questionnaire form involved a detailed explanation of the study. The subjects volunteered to participate in the study, completed the rest of the questionnaire that consisted of three sections. The first section of the questionnaire included the socio-demographic data form. The second and third sections involved the Beck Depression Inventory (BDI) and State (STAI-I) and Trait Anxiety Inventory (STAI-II), respectively. A total of 446 volunteers participated in the study.

Tools for Data Collection
Beck Depression Inventory (BDI):
The scale developed by Beck et al. was used to evaluate the presence and severity of depressive symptoms (10). It is a self-report scale including 21 items. The score may change between 0-63. The cut-off score of the scale is 17, and higher scores indicate the presence of clinically significant depressive symptoms. The Turkish validity and reliability study for BDI was conducted by Hisli et al. (11).

State and Trait Anxiety Inventory (STAI):
It was developed by Spielberger et al. in 1970 (12). It consists of two scales, namely the State Anxiety Inventory (STAI-I) and Trait Anxiety Inventory (STAI-II), each having 20 items. All of the items are scored from 1-4, and higher scores indicate high levels of anxiety. The validity and reliability study of its Turkish translation was conducted by Oner et al. (13). Scores on both scales range between 20 and 80. High scores indicate high anxiety levels, and low scores indicate low anxiety levels. The cut-off score of 40 is commonly recommended for determining clinically relevant anxiety levels (14,15).

Statistical analysis

All statistical analyses were performed with SPSS 25.0 package program. The Kolmogorov-Smirnov and the Shapiro-Wilk test were used to evaluate the normal distribution of the data. Continuous variables were defined as mean ± standard deviation, median (minimum-maximum values), and categorical variables were defined as number and percentage. Independent samples t-test was used for independent group comparisons when parametric test conditions were met, and the Mann-Whitney U test was used otherwise. We used the Spearman correlation analysis to analyze the relationships between continuous variables. We used Binary Logistic Regression models to determine risk factors. Statistical significance was accepted to be p<0.05.

RESULTS

Our study was conducted with 190 doctors and 256 nurses (total number: 446). The number of female and male participants was 271 (60.8%) and 175 (39.2%), respectively, and the mean age was 36.94 ± 8.7 years. The number of participants who worked in close contact with COVID-19 patients was 302 (67.7%) (Table I). Descriptive information for psychiatric symptoms in the general sample is presented in Table II.

When the mean depression scores of the participants in our study were examined, we found that 198 (44.4%) participants had depressive symptoms (BDI score 10≤), while 83 (18.6%) had clinically significant depression (BDI 17≤). There was no statistically significant difference according to gender (p>0.05). The mean BDI scores of nurses were found to be statistically significantly higher than that of the doctors (p = 0.001). The other groups with significantly higher mean BDI scores were those who received mental treatment before the pandemic (p = 0.001), those who did not exercise regularly (p = 0.0001), and those who were exposed to COVID-19 news for more than 1 hour a day (p = 0.0001) (Table I).

Table I. Relationship between sociodemographic/occupational characteristics of participants and scores of BDI, STAI-I, and STAI-II.

		BDI	STAI-I	STAI-II
Gender	Woman (n=271)	10.63 ± 8.52	43.83 ± 10.62	44.33 ± 8.22
	Man (n=175)	9.44 ± 8.75	41.61 ± 11.41	41.97 ± 8.25
	Inter group p	0.061 (z=-1.871)	0.036(t=2.101)	0.0001 (z=-3.615)
Occupation	Physician (n=190)	8.61 ± 7.66	41.43 ± 10.7	42.44 ± 8.87
	Nurse (n=256)	11.32 ± 9.11	44.1 ± 11.06	44.12 ± 7.8
	Inter group p	0.001 (z=-3.244)	0.011 (t=-2.557)	0.002 (z=-3.048)
Working in close contact with COVID-19 patients	No (n=144)	10.24 ± 8.49	42.53 ± 10.63	43.52 ± 8.29
	Yes (n=302)	10.13 ± 8.7	43.17 ± 11.15	43.35 ± 8.32
	Inter group p	0.768 (z=-0.295)	0.567 (t=-0.573)	0.692 (z=-0.397)
Doing physical exercise at home or not	No (n=281)	11.6 ± 9.09	44.52 ± 11.13	44.55 ± 8.42
	Yes (n=165)	7.72 ± 7.14	40.3 ± 10.21	41.45 ± 7.74
	Inter group p	0.0001(z=-4.858)	0.0001 (t=3.991)	0.0001 (z=-3.706)
Exposure time to COVID-19 publications	Less than 1 hour	7.98 ± 7.96	39.99 ± 10.84	42.01 ± 8.3
	More than 1 hour	11.56 ± 8.75	44.86 ± 10.65	44.29 ± 8.2
	Inter group p	0.0001 (z=-4.929)	0.0001(z=-4.597)	0.006 (z=-2.725)
Having psychiatric disorder prior pandemic	No (n=398)	9.63 ± 8.16	42.61 ± 10.71	42.85 ± 8.02
	Yes (n=48)	14.63 ± 10.85	45.83 ± 12.74	47.96 ± 9.22
	Inter group p	0.001 (z=-3.188)	0.144 (z=-1.459)	0.0001 (z=-3.552)
With mental distress during a pandemic	No (n=431)	10.11 ± 8.72	42.93 ± 11.04	43.36 ± 8.38
	Yes (n=15)	11.8 ± 4.74	43.87 ± 9.21	44.67 ± 5.47
	Inter group p	0.096 (z=-1.665)	0.592 (z=-0.536)	0.297 (z=-1.042)

SD: Standard Deviation; Med: Median; Min – max: Minimum – maximum values, STAI-I: State-Trait Anxiety Inventory-I STAI-II: State-Trait Anxiety Inventory-II BDI: Beck Depression Inventory

Considering the STAI mean scores of the participants, 60.5% (n = 270) had state anxiety scores considered to be clinically significant and 69% (n = 309) had trait anxiety scores considered to be clinically significant. Although there were clinically significant trait and state anxiety, mean scores in all variables, women (p = 0.036 for STAI-I, and p = 0.0001 for STAI-II), nurses (p = 0.011 for STAI-I, and p=0.002 for STAI-II), those who didn't exercise regularly (p = 0.0001), and who were exposed to COVID-19 news longer than an hour a day (p =

0.0001 for STAI-I, and p = 0.006 for STAI-II) had statistically significantly higher scores.

The trait anxiety level was found to be significantly higher in those with mental illness before the pandemic compared to those without prior mental illness (p = 0.0001) (Table I).

When the multivariate model, which was obtained from univariate models in logistic regression was examined, it was found that young age, long exposure times to COVID-19 news, lack of regular exercise, and mental illness prior to the pandemic were significant risk factors. Exposure to COVID-19 news for long hours and lack of regular exercise were risk factors for clinically significant state anxiety scores. Young age, lack of regular exercise, and a mental illness prior to the pandemic were significant risk factors for clinically significant trait anxiety scores (Table III).

Table II. Mean scores of STAI-I, STAI-II and BDI scales in the general sample.

	Mean ± SD	Med (min - max)
STAI-I	42.96 ±10.98	43 (20 - 79)
STAI-II	43.4 ±8.3	43 (22 - 79)
BDI	10.17 ±8.62	8 (0 - 47)

SD: Standard Deviation; Med: Median; Min – max: Minimum – maximum values. STAI-I: State-Trait Anxiety Inventory-I STAI-II: State-Trait Anxiety Inventory-II BDI: Beck Depression Inventory

Table III. Risk Factors for Depression and Anxiety Identified by Multivariable Logistic Regression Analysis.

Dependent Variable	Independent Variable	Univariate Models				Multiple Models			
		p	O.R.	95% C.I.for O.R. Lower	Upper	p	O.R.	95% C.I.for O.R. Lower	Upper
BDI (17 and more)	Age	0.003	0.96	0.93	0.986	0.108	0.97	0.938	1.006
	Gender (Woman)	0.034	1.75	1.043	2.94	0.47	1.25	0.682	2.293
	Marital status (Married)	0.312	0.77	0.459	1.283	-	-	-	-
	Living with children or elderly person	0.619	1.14	0.687	1.878	-	-	-	-
	Occupation (Nurse)	0.006	2.07	1.235	3.476	0.072	1.76	0.952	3.263
	Working in close contact with COVID-19 patients (Yes)	0.835	1.06	0.632	1.764	-	-	-	-
	Having a diagnosis of COVID-19	0.936	1.1	0.121	9.922	-	-	-	-
	Exposure time to COVID-19 publications (more than 1 hour)	0.001	2.51	1.444	4.362	0,001	2.78	1.497	5.163
	Doing physical exercise at home (No)	0.008	2.1	1.215	3.614	0.071	1.76	0.953	3.251
	With mental distress during a pandemic to apply for a doctor (Yes)	0.888	1.1	0.302	3.978	-	-	-	-
	Psychiatric disorder prior to pandemic (Yes)	0.001	3.07	1.618	5.841	0,023	2.38	1.128	5.029
STAI-I (40 and more)	Age	0.611	0.99	0.973	1.016	-	-	-	-
	Gender (Woman)	0.049	1.48	1.002	2.175	0.216	1.32	0.85	2.056
	Marital status (Married)	0.222	1.3	0.854	1.975	-	-	-	-
	Living with children or elderly person	0.035	1.53	1.03	2.261	0.117	1.41	0.918	2.165
	Occupation (Nurse)	0.05	1.47	1	2.154	0.755	1.07	0.69	1.666
	Working in close contact with COVID-19 patients (Yes)	0.808	1.05	0.701	1.577	-	-	-	-
	Having a diagnosis of COVID-19	0.98	0.98	0.162	5.91	-	-	-	-
	Exposure time to COVID-19 publications (more than 1 hour)	0.001	1.98	1.338	2.919	0.0001	1.99	1.311	3.032
	Doing physical exercise at home (No)	0.029	1.55	1.045	2.286	0.18	1.34	0.874	2.046
	With mental distress during a pandemic to apply for a doctor (Yes)	0.622	1.32	0.442	3.915	-	-	-	-
	Psychiatric disorder prior to pandemic (Yes)	0.769	1.1	0.591	2.035	-	-	-	-
STAI-II (40 and more)	Age	0.001	0.96	0.933	0.979	0.127	0.97	0.942	1.007
	Gender (Woman)	0.032	1.56	1.04	2.352	0.804	1.08	0.6	1.935
	Marital status (Married)	0.714	1.09	0.696	1.696	-	-	-	-
	Living with children or elderly person	0.042	1.54	1.016	2.32	0.092	1.7	0.917	3.164
	Occupation (Nurse)	0.005	1.79	1.194	2.692	0.882	1.05	0.57	1.925
	Working in close contact with COVID-19 patients (Yes)	0.296	1.25	0.82	1.918	-	-	-	-
	Having a diagnosis of COVID-19	0.653	0.66	0.109	4.006	-	-	-	-
	Exposure time to COVID-19 publications (more than 1 hour)	0.243	1.28	0.847	1.921	-	-	-	-
	Doing physical exercise at home (No)	0.009	1.73	1.145	2.607	0.318	1.34	0.757	2.353
	With mental distress during a pandemic to apply for a doctor (Yes)	0.367	1.81	0.501	6.501	-	-	-	-
	Psychiatric disorder prior to pandemic (Yes)	0.003	4.27	1.652	11.027	0.014	5.52	1.416	21.473

p<0.05 statistically significant effect; O.R.: Odds Ratio; C.I: Confidence Interval; Binary Logistic Regression STAI-I: State-Trait Anxiety Inventory-I STAI-II: State-Trait Anxiety Inventory-II BDI: Beck Depression Inventory

DISCUSSION

The first COVID-19 case in Turkey was detected on March 11. Many measures have been taken by the Ministry of Health to prevent the spread of the COVID-19 outbreak. In addition, measures to protect and improve mental health, such as the establishment of psychological support lines, have also been established (16).

A study conducted on the effects of COVID-19 on the mood of healthcare workers in China with doctors and nurses working in hospitals with a COVID-19 clinic showed that 50.4% and 44.6% of the participants had depression and anxiety symptoms, respectively (17). A study conducted in Turkey showed that 64.7% of the physicians had depressive symptoms, 51.6% had anxiety, and 41.2% had stress-related symptoms (9).

The rates of depressive and anxiety symptoms in our study that indicated the importance of the possible effects of the COVID-19 pandemic on the mental well-being of healthcare workers were in line with other studies. In our study, despite of the clinically significant depression and anxiety rates (based on the BDI and STAI scores), the rate of the people who visited a doctor for mental distress complaints during the pandemic is only 3.36%. The observed low rate of healthcare workers who visited a doctor for mental distress reveals the critical need for psychiatric support to healthcare workers during the pandemic.

In a study conducted during the previous SARS epidemic, it was stated that anxiety and fear prevailed in the early stages of the pandemic, and depression and post-traumatic stress symptoms prevailed in the long term (18). We found higher levels of anxiety than depression which might be due to the fact that our study was conducted at an earlier period of the pandemic.

The fact that the depression and anxiety scores of nurses were found to be significantly higher than physicians in our study is consistent with the literature (17). However, the logistic regression analysis demonstrated that being a nurse did not have an increasing effect on the risk of depression and anxiety while being younger increased the risk, which might be due to the significantly younger mean age of nurses in the study compared to that of the physicians (p = 0.0001). This might be attributed to less duration of professional experience.

During a pandemic, people seek fast and reliable information. The media can have a positive and an adaptive effect on mental health; on the other hand, it can increase anxiety by disseminating news filled with risk messages and negativity (19). Anxiety and uncertainty can increase media exposure and stress, resulting in a vicious cycle that is difficult to break (20).

In this paper a relationship was found between longer periods of exposure to COVID-19 news and high depression and anxiety scores. Prolonged exposure to the news of COVID-19 may cause increased symptoms of depression and anxiety in healthcare professionals, on the other hand healthcare professionals who already have high anxiety levels may follow news sources more closely in order to reduce their anxiety.

It has been reported that physical activities, which are exercise-based interventions, were effective as independent or adjunctive treatments to reduce anxiety symptoms and reduce symptoms in trauma and stress-related disorders such as in patients with post-traumatic stress disorder (21-23).

A meta-analysis conducted to determine the effectiveness of exercise in treating depression reported that exercise had a moderate effect in reducing depressive symptoms in adults (24). These findings are consistent with the significantly lower depression and anxiety scale scores of those who exercise regularly than those who do not. These findings suggest that physical exercise is one of the protective factors for mental health in the pandemic.

There are advantages and disadvantages of our study being conducted through an online survey. Since it is a self-report scale, there are no results for the clinical evaluation by the clinician. However, it has provided the opportunity to reach more people than might be available through face-to-face interviews. One of the limitations of our study is the limited data on working conditions and hours of occupational groups. Since our study is a cross-sectional study, the long-term psychological effects of the pandemic on healthcare workers couldn't be evaluated.

CONCLUSION

In this study, considering the anxiety and depression levels of healthcare workers, they were at risk for anxiety and depression during the pandemic process. However, we found that being at a younger age, long periods of exposure to COVID news, having mental illness prior to the pandemic, and lack of regular physical exercise increased the risk of depression and / or anxiety.

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