RESEARCH ARTICLE

Impact of The Covid-19 Pandemic on Anxiety and Depression Levels of The Dialysis Center Employees

Ahmet Karataş[1], Ebru Çanakcı[2], Yasemin Kaya[3], Sedat Bostan[4], Aykut Özturan[5], Ayşegül Ongun[6], Yasin Eryılmaz[7], Deniz Deniz Özturan[8], Ceren Varer Akpınar[9]

[1]Department of Internal Medicine, Division of Neprology, Ordu University, Faculty of Medicine, Ordu, Turkey
[2]Department of Anesthesiology and Reanimation, Ordu University, Faculty of Medicine, Ordu, Turkey
[3]Department of Internal Medicine, Ordu University, Faculty of Medicine, Ordu, Turkey
[4]Department of Healthcare Management, Ordu University, School of Health Science, Ordu, Turkey
[5]Clinic of Internal Medicine, Ordu State Hospital, Ordu, Turkey
[6]Hemodialysis Center, Education and Research Hospital, Ordu, Turkey
[7]Clinic of Nephrologhy, Ordu State Hospital, Ordu, Turkey
[8]Department of Mental Health of Diseases, Ordu University, Faculty of Medicine, Ordu, Turkey
[9]Ministry of Health, Department of Healthcare Manegement, Ordu, Turkey

Abstract
Objective: Coronavirus (COVID-19), an acute respiratory tract disease caused by a new coronavirus (SARS-CoV-2, formerly known as 2019-nCoV), first emerged in China and then drew attention spreading worldwide. In our study we aimed to determine the impact of the Covid-19 pandemic on the dialysis center employees.
Methods: The healthcare professionals to take part in the study were limited to the dialysis center employees. The study used a questionnaire comprising the participants' socio-demographic characteristics, Beck Anxiety Inventory and Beck Depression Inventory, asdata collection tool. The participants completed the questionnaire on voluntary basis in their own environment. As the Beck Anxiety Inventory and Beck Depression Inventory are grading inventories, their validity was confirmed via factor analyses. In addition their reliability analyses were conducted. In order to test the purposes of the study, the SPSS statistics software was used. The analyses were carried out at 95% (p=0.05) confidence interval. The study used descriptive statistical methods, t and ANOVA tests and correlation analysis.
Results: Among the participants;54.4% are female and 79.4% are aged 26 to 49 years. 51% of the participants have encountered patients with covid, 41.2% have served patients with covid, 22.1% had covid test and tested negative. 55.9% of the participants have developed no anxiety symptoms, while 24% havedeveloped mild symptoms, 11.8% moderate symptoms and 8.3% severe symptoms. 59.3% of the participants have developed no depression symptoms, while 27.5% have developed mild symptoms, 11.3% moderate symptoms and 2% severe symptoms. It was determined that the participants' gender, occupation (title), type of their hospital, state of encountering patients with covid and serving these patients, affected their anxiety and depression levels.
Conclusion: A significant rate of anxiety and depression was determined in the healthcare professionals providing service in hemodialysis units during the Covid-19 pandemic. In all pandemics, it is necessary to carefully evaluate not only patients, but also healthcare professionals providing service to chronic patients and to take measures. Otherwise healthcare professionals who do not feel well, will not be able to provide effective service.
Key words: Covid-19, Anxiety, Depression, Dialysis Center Employees

Address for correspondence/reprints:

Ahmet Karataş

Telephone number: +90 (532) 579 07 72

ORCID-ID 0000-0001-9095-6054

E-mail: karatas55@hotmail.com

Introduction

COVID-19 represents the seventh member of the coronavirus family which infects people and is categorized under the orthocoronavirus subfamily. COVID-19 forms a clot in the sarcocovirus subgenus. Covid-19 which is a new type of coronavirus, first emerged as an etiologic agent in indefinite pneumonia cases in the Wuhan city of China. An acute respiratory tract disease caused by a new coronavirus (SARS-CoV-2, formerly known as 2019-nCoV), coronavirus (COVID-19) first emerged in China and then drew attention spreading worldwide. SARS-CoV-2 is a β-coronavirus which is anenveloped RNA virus with a positive sensitivity to non-segment (Zhu et al;2019). In China a total of 79.968 COVID-19 cases and 2873 deaths have been determined since 1 March 2020 (WHO Corona virus disease situation reports ;2020).

Contagiousness of the COVID-19 infection from person to person has led to the isolation of the patients receiving various treatments. Comprehensive measures have been taken to reduce contagiousness of COVID-19 from person to person, in order to control the present pandemic. It is necessary to apply a particular effort and attention in order to protect or reduce infection among sensitive populations, including children, healthcare service providers and the elderly (Hussin et al, 2020). Just as the general population is under the risk of a psychological distress during the COVID-19 pandemic, the experiences gained from the SARS and H1N1 pandemics stress the importance of the psychological pressure on healthcare professionals who come to the forefront in interventions aimed at suppressing the pandemic (Chong et al; 2004, Goulia et al, 2010).

The study showed that there was a significant correlation between anxiety and depression levels of the hemodialysis patients and caregivers (Wang; 2012; Sajadi et al, 2017). It is necessary to individually evaluate the dialysis patients and professional caregivers administering treatment to these patients and to apply special interventions in order to reduce anxiety and depression levels among them (Gerogianni et al, 2019). Assistant health personnel working in the dialysis unit should pay attention to personal hygiene and should be ensured to work with protective equipment (mask, gloves, protective gown, disinfectant). This awareness can reduce the level of anxiety. Hospital management should provide all the necessary support for the provision of protective equipment, otherwise an important health service such as dialysis service will be interrupted.(Naicker et al, 2020) Interestingly enough, healthcare professionals tend to focus on biological aspect of the disease or other technical issues related to hemodialysis machine. They usually underestimate the symptoms in the mental area (Vasilopoulou et al, 2016). It might be a necessary measure to encourage patients to express their feelings and meet their psychological needs, in order to face this enervating disease. Inadequately treated or untreated anxiety and depression may reduce the quality of life among patients and caregivers (Pereira et al;2017).

In this study we investigated the impacts of the Covid-19 pandemic on anxiety and depression of the hemodialysis employees.

Methods

Purpose of the Research

The study aims to determine the impact of the Covid-19 pandemic on the dialysis center employees. Thus, the healthcare professionals to take part in the study were limited to the dialysis center employees.

Research Questions

In the research, how are
a) anxiety levels b) depression levels of healthcare workers working in dialysis centers serving during the covid-19 pandemic process?
c) What is the relationship between anxiety levels and depression levels? Answers to their questions were sought.

Research Design and Study Poulation

The population of the study was limited to healthcare workers in seven dialysis centers operating in Ordu. In order to carry out the study, first of all, the researchers made observations in dialysis centers and interviewed working people and experts. First of all, ethics committee and research permissions were obtained. The questionnaire, consisting of research scales, was distributed by hand to healthcare

professionals working in seven dialysis centers, who volunteered to participate in the study. The sample was not determined because it was desired to reach the entire study population. 194 research forms were collected back in a day or two. Approximately 70% of the healthcare professionals working in seven dialysis centers participated in the study. The data were encoded and uploaded to the computer environment. Analysis of data was done in computer environment.

Data Collection Scales, Process and Scale Analyses

In the study, a questionnaire consisting of socio-demographic characteristics, back anxiety scale and back depression scale was used as data collection tool. Back anxiety (Back at all; 1988) and back depression (Back; 1961) scales are scales that determine the anxiety and depression level of the individual by detecting the symptoms that have arisen in the individual in the last week due to stress or mental problems. In each statement of the scales, the absence of the queried symptom was scored as 1, the presence degree as 2, 3, and 4. The anxiety or depression levels defined by the total score are given in the tables.

The study used a questionnaire comprising the participants' socio-demographic characteristics, Beck Anxiety Inventory and Beck Depression Inventory, as data collection tool. Ethics committee decision to apply the questionnaire was made with an approval number dated 16.04.2020, numbered 2020/70. The questionnaire was applied to the hemodialysis unit employees in seven public hospitals, four private hospitals and one university hospital by hand. The participants completed the questionnaire on voluntary basis in their own environment. The questionnaire was applied between 17-30 April 2020.

As the Beck Anxiety Inventory and Beck Depression Inventory are grading inventories, their validity was confirmed via factor analyses. Validity is a degree of a test or an inventory to measure things (Coskun et al., 2017). In addition, their reliability analyses were conducted. Table 1 shows the results of the factor analyses of the inventories.

Examining Table 1; it is seen that the KMO sample coefficient of both inventories is above 0.80. It is accepted that as the KMO value approaches one, the sample size used in a study reaches excellence. This value is accepted to be very good when it is 0.80 and excellent when 0.90 (Karagoz, 2017). The Bartlett's Test of Sphericity which was used for assessing the convenience of the inventory for the factor analysis, was found to be significant (p<0.001).

Accordingly, the inventories were found to be convenient for the factor analysis. It was determined that both inventories had higher factor loads in general and had adequate power to explain the total variance. As the inventories' Cronbach's alpha coefficient for the reliability analysis was above 0,80, they were found to be highly reliable.

In order to test the purposes of the study, the SPSS 26 statistics software (Ordu University demo version) was used. The analyses were carried out at 95% (p=0.05) confidence interval. The study used descriptive statistical methods, t and ANOVA tests and correlation analysis.

Table 1. Validity and Reliability Analyses of the Inventories

Factor Analysis		Beck Anxiety	Beck Depression
Kaiser-Meyer-OlkinMeasure of Sampling Adequacy.		0.893	0.876
Bartlett's Test of Sphericity	Approx. Chi-Square	2736.241	1931.365
	Df	210	210
	Sig.	0.000	0.000
Factor load range		350-771	419-784
Total variance explained	%	43.422	34.955
Cronbach'salpha		0.933	0.897

Results

Table 2 shows descriptive data of the dialysis center employees who took part in the study.

Examining Table 2; 54.4% of the participants are female, 72.1% are married, 41.7% have kids, 79.4% are aged 26 to 49 years and 44.6% have been working in the dialysis center for 1-5 year(s). 14.7% of the participants comprise doctors, 27.9% nurses, 17.2% dialysis technicians, 6.4% secretaries and 33.8% auxiliary medical personnel. Occupational distribution of the participants is appropriate for the personnel structure of dialysis centers. Among the participants; 49.5% work in dialysis centers affiliated with the Ministry of Health, 39.7% in private hospitals and 10.8% in university hospitals. 53.9% of the participants work in a hospital which has been declared a pandemic hospital. 17.2% of the participants have a chronic disease.

51% of the participants have encountered patients with covid, 41.2% have served patients with covid, 22.1% had covid test and tested negative. 44.6% of the participants stated that there was a decrease in the number of patients during the pandemic.

Table 3 shows anxiety level of the participants during the pandemic process. Examining the table; it

was determined that 55.9% of the participants developed no anxiety symptoms, while 24% developed mild symptoms, 11.8% moderate symptoms and 8.3% severe symptoms.

Table 2. Frequency Table Related to Descriptive Variables of the Participants

Variable	N	%	Variable	N	%
Gender			Title		
Female	111	54.4	Doctor	30	14.7
Male	93	45.6	Nurse	57	27.9
Marital Status			Dialysis Technician	35	17.2
The married	147	72.1	Secretary	13	6.4
Single	57	27.9	Assistant Medical Staff	69	33.8
Child Status			Hospital Type		
Yes	85	41.7	Ministry of Health	101	49.5
No	119	58.3	University	22	10.8
Age			Private Dialysis Center	81	39.7
25 years and under	25	12.3	Hospital Pandemic Hospital?		
26-49	162	79.4	Yes	110	53.9
50 years and over	17	8.3	No	94	46.1
Working Year at the Dialysis Center			Do you have any chronic diseases?		
1-5	91	44.6	No	169	82.8
6-10	54	26.5	Yes	35	17.2
11-15	36	17.3	Did you meet the Covıd patient?		
16+	23	11.3	Yes	104	51.0
Did you get a Covid Test?			No	100	49.0
Yes	45	22.1	Did you serve the Covid Patient?		
No	158	77.9	Yes	84	41.2
Test result			No	120	58.8
Negative	43	21.2	Is there a decrease in the number of patients?		
			Yes	91	44.6
			No	113	55.4

Table 3. An Assessment of the Participants' Beck Anxiety Inventory

Beck Anxiety Inventory Report	N	%
No (0-7)	114	55.9
Low lewels (8-15)	49	24.0
Modereta Lewels (16-25)	24	11.8
High Lewels (26-63)	17	8.3

Table 4. An Assessment of the Participants' Beck Depression Inventory

Beck Anxiety Inventory Report	N	%
No (0-7)	114	55.9
Low lewels (8-15)	49	24.0
Modereta Lewels (16-25)	24	11.8
High Lewels (26-63)	17	8.3

Table 4 shows depression level of the participants during the pandemic process. Examining the table; it was determined that 55.3% of the participants developed no depression symptoms, while 27.5% developed mild symptoms, 11.3% moderate symptoms and 2% severe symptoms.

The t and ANOVA tests investigated whether the participants' independent variables had a distinctive impact on their anxiety and depression levels or not. It was determined that the participants' age, marital status, state of having kids, working year, presence of a chronic disease, state of working in a pandemic hospital and havinga covid test, did not affect their

anxiety and depression levels. On the other hand, it was determined that the participants' gender, occupation (title), type of their hospital, state of encountering patients with covid and serving these patients, affected their anxiety and depression levels.

The female employees were affected by the covid pandemic more than men, in terms of anxiety level (at the error level of p=0.002) and depression level (at the error level of p=0.014). Among the employees working in dialysis units, the nurses were affected by the covid pandemic more than the doctors and auxiliary medical personnel, in terms of anxiety level (at the error level of p=0.002) and depression level (at the error level of p=0.005). It was seen that the participants working in hospitals affiliated with the Ministry of Health had a higher depression level than those working in university hospitals at the error level of p=0.018.

Encountering patients with covid increases anxiety level of the dialysis unit employees at the error level of p=0.001 and serving patients with covid increases their depression level at the error level of p=0.001. Anxiety level of the participants who stated that there was a decrease in the number of patients during the pandemic, was found to be higher than others at the error level of p=0.002.

In the study, a correlation analysis was conducted to describe the correlation of the inventories with encountering patients with covid and serving patients with covid. Table 5 shows the results of the correlation analysis.

Examining Table 5; it was determined that there was a linear high correlation between anxiety and depression levels of the participants at the error level of p=0.001. On the other hand, there was a reversely weak correlation between anxiety level and encountering patients with covid and having a patient relative with covid. Accordingly, it was found that as anxiety level of the individuals increased, their depression level increased. Also, anxiety level was found to be higher when encountering patients with covid or serving patients with covid. It was determined that there was no correlation between encountering patients with covid or serving patients with covid, in terms of depression level of the participants. A linear high correlation was also observed between encountering patients with covid or serving patients with covid.

Table 5. Results of the Correlation Analysis

	Beck Anxiety	Beck Depression	Serving the patient with Covid
Beck anxiety	1		
Beck depression	,707(**)	1	
Serving the patient with Covid	-,225(**)	-,105	1
Meeting the patient with Covid	-,238(**)	-,134	,781(**)

Discussion

According to the results of our study, it was determined that gender, occupation (title), type of hospital, state of encountering patients with covid and serving these patients, affected anxiety and depression levels of the personnel providing care service in hemodialysis units during the Covid-19 pandemic.

Anxiety disorders are common in the general population and affect nearly 40 million American adults (WHO Geneva ;2010).

The studies have shown a lower quality of life and sleep quality among patients with chronic renal disease, compared to the general population (Kusek et al, 2002; Perlman et al, 2005; Karatas et al, 2018). However, the studies investigating mental state of medical personnel who provide care to hemodialysis patients, are not adequate in number.

Psychological distress among medical personnel affects not only their health, but also the health and safety of patients (Hall et al, 2016). In their study, Lwia et al. (2017) investigated the role of caregiver mental health in neurodegenerative patient mortality. In a caregiver group of 176, they found that worse caregiver mental health predicted more patient mortality, considering the key risk factors in patients (recent diagnosis, age, gender, dementia severity and patient's mental health). Mahoney.et al. (2005) determined anxiety (25.3%) and depression (10.5%) in family caregivers providing care to Alzheimer's patients. They claimed that Alzheimer's patient caregivers with caregiver anxiety have a lower quality of patient service.

In the study by Panagiota et al. investigating the impacts of the A/H1N1 influenzapandemic on healthcare professionals, it was found that 46.9% of the healthcare professionals had concerns about contagious pandemics (Goulia et al; 2010). In the study by Arechabala. et al., (2011) it was found that individuals providing care to hemodialysis patients had caregiver burden symptoms. According to the National Comorbidity Study Replication (NCS-R) data, 19.1% of adults suffer from anxiety disorder. Prevalence of anxiety disorder is higher in women

(23.4%) than men (14.3%) (Anxiety Disorders; anxiety-disorders / index .shtml).

In our study, anxiety level of the cases was similar with the study by Panagiota G. et al. However, it was higher than the National Comorbidity Study Replication (NCS-R) data. It was found that 55.9% of the cases in our study had no anxiety, while 44.1% had anxiety at different levels (mild, moderate, severe).We believe that the Covid-19 pandemic affecting the whole world, has a greater negative impact especially on medical teams struggling with this disease in the field. Our study shows that care of hemodialysis patients negatively affects emotional state of caregivers. In this respect our study is in agreement with other similar studies investigating anxiety and depression of caregivers of hemodialysis patients.

Depression is the most frequent psychiatric disorder encountered in general society (Kessler et al, 2011). Also, it is the most frequent mental health condition encountered in primary patients (Ansseau et al, 2004). It is estimated that only 50% of patients with major depression are identified without screening (Mitchellet al, 2011). In their study, Yan Wang et al. stressed the necessity of developing interventions and appropriate coping styles in order to reduce the stress of Chinese doctors in the future (Wang et al;2019).

The DEPRES study assessing depressive disorder ratio in six European countries, found the prevalence to be at the rate of 17%. It was determined that 13.359 of the 78.463 adults who took part in the study had suffered from any type of depression or experienced depression in the last six months. Thus, the six-month prevalence of any type of depression in society was found to be 17% (Arbabzadeh-Bouchez et al, 2002). In a metaanalysis conducted by Alex J. Mitchell et al., it was determined that depression prevalence varied according to nations, which was expected. While Italy (27.4%) and Netherlands (22.7%) had the highest rates of depression, England (15.6%) and the United States (12.5%) had lower rates. The lowest rate was observed in Australia (10.9%) (Mitchell et al;2009).

Chong et al. (2004) conducted a study assessing SARS-related stress and its psychological impacts among healthcare professionals. In the study, the psychiatric morbidity was three times higher in the healthcare professionals (75.3%) than the normal population in Taiwan (24%). The same study found depression in 74.4% of the cases. In our study, we observed depression at different levels at the rate of 40.7% in total. Depression was found to be higher in our study than the DEPRES study showing depression rate in thenormal population. However, it

was found to be lower than the study by Chong MY. et al. which has similar characteristics to our study (the impact of SARS on healthcare professionals). It is possible to state that although healthcare professionals have higher rates of depression than the normal population concerning pandemics, these rates have dropped in individuals providing healthcare service in the course of time.

In the study by Ansseau et al., (2004) anxiety was found to be higher in women than men. In their study investigating common anxiety prevalence in society, Wittchen et al. (1994) claimed that the prevalence was two times greater in women than men. Similarly, our study found anxiety level to be higher in women. Our study results are in agreement with the literature findings.

In their study, Ferrari et al. (2013) found the 12-month prevalence of global major depressive disorder to be 5.8% in women and 3.5% in men. Similarly, Bebbington et al. (1998) suggested that depression and depression episode were higher in women than men. Also, our study found depression level to be higher in women. Our study results are in agreement with the literature findings.

In their study, Chong et al. (2004), stated that healthcare professionals had an increased psychiatric morbidity such as feeling defenseless, unsafe and threatened due to the SARS pandemic. Also, in our study we observed that hemodialysis personnel who had close contact with the Covid-19 patients in the field, had a higher prevalence of psychiatric disorders such as anxiety and depression compared to the normal population. In this respect our study is in agreement with the study conducted by Chong. et al. (2004).

In a study investigating the impact of healthcare staff on the psychological stress of the H1N1 pandemic, Gaulia and colleagues claimed that nurses were more psychologically affected in pandemics than other healthcare professionals (Goulia et al, 2010). In the studies of Seale H et al. Showing the psychological effects of influenza pandemic on health personnel, pandemic was claimed to have more psychological effects on auxiliary healthcare staff compared to doctors and nurses (Seale et al;2009). In our study, we found that, similar to the work of Goulia et al (2010), The Covid-19 pandemic affects nurses the most. Our study is partially compatible with the literature in this aspect.

According to the National Comorbidity Survey (NCS) data, it is reported that depression comorbidity has increased in individuals with general anxiety disorder. Similarly, common anxiety disorder comorbidity is higher in individuals with major

depression (Huppert, 2008). A number of studies have shown that major depressive disorder (MDD) and common anxiety disorder (CAD) have the highest comorbidity rates among all mood and anxiety disorders (Brown, 2001; Huppert, 2008). Also, in our study, it was found that there was a linear high correlation between anxiety and depression levels of the participants and as their anxiety level increased, their depression level increased. Our study in this respect is in agreement with the literature.

The limitations of our study are as follows; cases are limited to the region we live in, has a limited number. In addition, the use of self-report scales recorded by patients rather than diagnostic interviews in psychiatric morbidity assessment is another limitation of our study.

Conclusion

As a consequence, our study determined a significant rate of anxiety and depression symptoms in the healthcare professionals providing service in hemodialysis units during the Covid-19 pandemic. In all pandemics, it is necessary to carefully evaluate not only patients, but also healthcare professionals providing service to chronic patients and to take measures. Otherwise healthcare professionals who do not feel well, will not be able to provide effective service.

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