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Sleep Disturbances, Depression and Anxiety in Hemodialysis Patients in COVID-19 Pandemic

COVID-19 Pandemisinde Hemodiyaliz Hastalarında Uyku Bozuklukları, Depresyon ve Anksiyete

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Abstract

Objective: Coronavirus disease-2019 (COVID-19) has not only threatened physical health, but has also grown as a burden to public health, economics and mental well-being. Hospital visits for many reasons have decreased. However, some special groups of facilities such as hemodialysis (HD) can not be disrupted. Anxiety and depression are important problems in patients undergoing HD. We aimed to assess symptoms of anxiety, depression, and sleep disturbances among HD patients during the COVID-19 pandemic and determine factors associated with psychological distress.

Materials and Methods: In this observational, cross-sectional study, HD patients were asked to fill out questionnaire about sociodemographic factors, education level, employment and economic status, and marital status. They were asked about worries regarding the COVID-19 infection, whether they had been infected by COVID-19, admitted to hospital or to the intensive care unit. Each participant was delivered the Pittsburgh sleep quality index (PSQI), Beck depression inventory, and Beck anxiety inventory.

Results: The mean age of 58 patients was 50.9±14.6 (22-76) years; 19 (32.8%) had been infected with COVID-19 and 10 (15.5%) were admitted to the hospital. Fifteen patients had household contacts who had been infected with severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) and four patients had household contacts who died. Most (69%) have reported that they were unaffected by the COVID-19 news, while 29% have said that the media increased their worries. Sleep quality was poor (PSQI ≥5) in the majority (n=36, 59%). Having COVID-19 was found to harm the quality of sleep. Poor quality of sleep was seen in 68.4% of COVID-19 survivors, whereas this ratio was 59% in participants who had not been infected by SARS-CoV-2.

Conclusion: Sleep quality seems to be negatively influenced by COVID-19.

Keywords: Hemodialysis, COVID-19, sleep

Öz

Amaç: Koronavirüs hastalığı-2019 (COVID-19) yalnızca hayatı tehdit etmekle kalmamış, aynı zamanda halk sağlığı, ekonomi ve ruh sağlığı üzerinde bir yük oluşturmuştur. Hastane ziyaretleri azalmıştır, ancak hemodiyaliz (HD) gibi bazı özel durumlar aksatılamaz ve hastaneye geliş-gidişlerin devamı gerekir. Anksiyete ve depresyon HD hastalarında önemli sorunlardır. COVID-19 pandemisi sırasında HD hastalarında anksiyete, depresyon ve uyku bozuklukları semptomlarını değerlendirmeyi ve psikolojik sıkıntı ile ilişkili faktörleri belirlemeyi amaçladık.

Gereç ve Yöntem: Bu gözlemsel, kesitsel çalışmada, HD hastalarından sosyodemografik faktörler, eğitim düzeyi, istihdam ve ekonomik durum ve medeni durum hakkında anket doldurmaları istendi. COVID-19 enfeksiyonu ile ilgili endişeleri, COVID-19 ile enfekte olup olmadıkları, hastaneye veya yoğun bakım ünitesine yatırılıp yatırılmadığı soruldu. Pittsburgh uyku kalitesi indeksi (PUKİ), Beck depresyon anketi ve Beck anksiyete anketi ile değerlendirildi.

Bulgular: Yaş ortalaması 50,9±14,6 (22-76) olan 50 hasta değerlendirildi; 19'u (%32,8) COVID-19 ile enfekte olmuş ve 10'u (%15,5) hastanede tedavi edilmişti. On beş hastanın ağır akut solunum yolu sendromu-koronavirüs-2 (SARS-CoV-2) ile enfekte olmuş ev temaslıları vardı ve dört hasta yakınını kaybetmişti. Çoğu (%69) COVID-19 haberlerinden etkilenmediklerini bildirirken, %29'u medyanın endişelerini artırdığını söyledi. Çoğunluğunda (n=36, %59) uyku kalitesi kötüydü (PUKİ ≥5). COVID-19 geçirmenin uyku kalitesine zarar verdiği görüldü. COVID-19 geçirenlerin %68,4'ünde kötü uyku kalitesi görülürken, SARS-CoV-2 ile enfekte olmayan hastalarda bu oran %59'du.

Sonuç: Uyku kalitesinin COVID-19 pandemisinden olumsuz etkilendiği düşünülmüştür.

Anahtar Kelimeler: Hemodiyaliz, COVID-19, uyku

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Introduction

The coronavirus disease-2019 (COVID-19), an infectious disease caused by a novel coronavirus severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) initially appeared in China in December 2019. It has quickly evolved worldwide and has been declared a global pandemic by the World Health Organization on March 11, 2020. This is the same date that the first confirmed case was announced in Turkey, as well.[1] COVID-19 has not only threatened physical health but has also grown as a burden to public health, economics, and mental well-being. Since its emergence and subsequent rapid spread, many lives have been affected. People all around the world have been physically isolated from family, work, schools. Lockdowns, compulsory quarantines after travel or contact with potentially infected individuals, the shutdown of many services, closure of borders, travel restrictions have substantially changed many lives. With the ongoing pandemic, wearing masks and social distancing have become increasingly overwhelming. Without a doubt, the current COVID-19 pandemic is a remarkable stressor. Thus, the psychosocial consequences of COVID-19 are no less devastating than the physical effects. A substantial population is troubled with anxiety, depression, and sleep difficulties. One of the proactive measures taken was suspending many routine and non-emergency hospital services. Hospital visits for many reasons have decreased. However, some special groups of facilities can not be disrupted. For instance, the continuum of hemodialysis (HD) should be provided. Chronic kidney disease (CKD) and dialysis are among the pioneering risk factors for poor prognosis and death in COVID-19.[2]

Anxiety and depression are important problems in patients with kidney failure treated by maintenance dialysis. Psychosocial factors and perceptions of quality of life may be associated with disease outcomes.[3] In the HD population, education status, income, marital status, and sleep disorders can be considered as social determinants of psychonephrology.[4]

We aimed to assess symptoms of anxiety, depression, and sleep disturbances among HD patients during the COVID-19 pandemic and determine factors associated with psychological distress.

Materials and Methods

Study Design

This is an observational, cross-sectional study of HD patients.

Study Population

The data was collected from adult patients (>18 years of age) under maintenance dialysis in the HD unit in our hospital. The patients with previous diagnoses of mental and psychological diseases, or neurological impairment and cognitive dysfunction, patients taking sleep medication, patients with central venous catheters, and those who were unable to finish the survey were not included in the study. The HD patients included in the study had fractional urea clearance (Kt/V) above 1.4 (Figure 1).

All participants signed an informed consent form. The study was approved by the Turkish Republic Ministry of Health and the University of Health Sciences Turkey, Kartal Dr. Lütfi Kırdar City Hospital Clinical Research Ethics Committee (decision no: 2021/514/208/16, date: 25/08/2021).

Study Instruments

The procedures and inquiries have been individually explained to the patients. Participants were asked to fill out a questionnaire including data about sociodemographic factors, education level, employment and economic status, and marital status. They were asked about worries regarding the COVID-19 infection, whether they had been infected by COVID-19, admitted to hospital, or to the intensive care unit (ICU). Each participant was administered the Pittsburgh sleep quality index (PSQI), Beck depression inventory (BDI), and Beck anxiety inventory (BAI).

Pittsburgh Sleep Quality Index[5]

The Turkish version of PSQI was used to assess sleep quality.[6] PSQI is a self-reported questionnaire designed to measure sleep disturbances and sleep habits over one month. It consists of 19 items rated on a 5-point Likert scale. A total score equal to or more than 5 indicates poor sleep quality.

Beck Depression Inventory[7,8]

The Turkish version of BDI was used to assess characteristic attitudes and symptoms of depression.[9] It is a 21-item, multiple-choice, self-reported-rating inventory. The answers are scored on a Likert scale from 0 to 3 and are summed up to create a

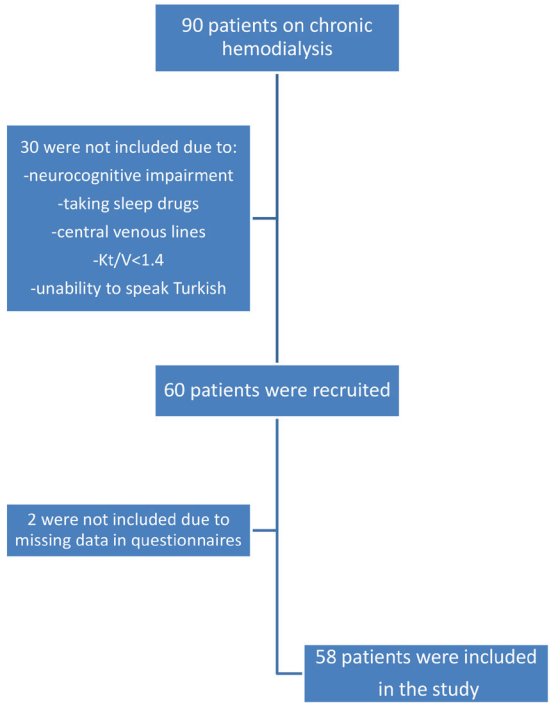

Figure 1. The flow diagram to show the study population
Kt/V: Fractional urea clearance

score between 0 and 63. A total score from 0 to 9 indicates no or minimal depression; from 10 to 18 indicates mild depression; from 19 to 29 indicates moderate depression; and from 30 to 63 indicates severe depression. It is a widely used psychometric test used for measuring the severity of depression.

Beck Anxiety Inventory[10]

The Turkish version of BAI was used to assess the severity of anxiety.[11] It is a 21-question multiple-choice self-report inventory. The answers are scored on a Likert scale from 0 to 3. A total score from 0 to 7 is interpreted as no or minimal level of anxiety; from 8 to 15 as mild anxiety; from 16 to 25 as moderate anxiety, and from 26 to 63 as severe anxiety.

Statistical Analysis

The sociodemographic characteristics were evaluated by descriptive statistics. Continuous data were expressed as median, mean ± standard deviation. Sleep disturbances, depression, and anxiety were expressed regarding inventory scores, and mean scores of PSQI, BDI, and BAI were calculated. The t-test and Mann-Whitney U test were used for comparison of the groups. The statistical analyses were conducted using SPSS (version 19), and p-values less than 0.05 were considered as statistically significant.

Results

A total of 58 patients filled in the questionnaires and participated in the study. The mean age of the study population was 50.9±14.6 (22-76) years, and 29 (50%) were males. The patient characteristics are demonstrated in Table 1. Of the study population, 19 (32.8%) had been infected with COVID-19 and 10 (15.5%) were admitted to the hospital; none of them required ICU admission. None of the subjects who had the infection complained of ongoing symptoms related to COVID-19.

Fifteen patients had household contacts who had been infected with SARS-CoV-2, and four patients had household contacts who died due to COVID-19.

Sixteen patients (27.6%) have reported that they spent more than one hour on COVID-19 news in the media. Most of the patients (69%) have reported that they were unaffected by the COVID-19 news, while 29% have said that watching, listening, or reading about the pandemic increased their worries. Table 2 demonstrates the questions we asked about the social and emotional effects of the pandemic on HD patients and their answers. The majority (77.6%) of the study group have reported that they were unemployed and seven patients (12%) stated that they had either lost their jobs or had been negatively affected.

Sleep quality was poor (PSQI ≥5) in the majority of the participants (n=36, 59%). Having COVID-19 was found to have a negative effect on the quality of sleep. Poor quality of sleep was seen in 68.4% of COVID-19 survivors, whereas this incidence was 59% in participants who had not been infected by SARS-CoV-2. The differences between the two groups were more pronounced especially in subjective sleep quality and sleep latency parameters (Table 3). Married participants showed poorer sleep quality than their single counterparts. The sleep quality and depression and anxiety indices were better in people living with their parents.

Depression and anxiety scores according to Beck inventories are demonstrated in Figure 2. The majority of the patients reported any degree of depression or anxiety. The history of COVID-19 was not found to be correlated with the level of depression or anxiety. BDI and BAI scores were 14.11±9.58 and 12.44±8.59 in subjects who had the infection; and 14.45±9.95 and 12.74±12.31 in those who did not have COVID-19, respectively. The differences were not statistically significant (p=0.90 for BDI, and p=0.92 for BAI) (Table 4).

The results of PSQI, BDI, and BAI in the study population

Table 1. The demographic data of the study population

Age	
Min-max (median)	22-76 (51)
Mean ± SD	50.9±14.6
Gender (female/male) (n)	29/29
Duration of dialysis (months)	
Min-max (median)	4-276
Mean ± SD	39.4±57.9 (19)
Marital status (n-%)	
Married	42 (72.4)
Single	10 (17.2)
Household residents (n-%)	
Husband/wife	16 (27.6)
Children	4 (6.9)
Parents	10 (17.2)
Living alone	4 (6.9)
Husband/wife and children	24 (41.4)
Education level (n-%)	
None	6 (10.3)
Primary school	30 (51.7)
High school	20 (34.5)
University	2 (3.4)
Smoking status (n-%)	
Current smoker	11 (19.0)
Ex-smoker	224 (41.4)
Non-smoker	23 (39.7)

min: Minimum, max: Maximum, SD: Standard deviation

Table 2. The results of the questionnaire

By the pandemic	Yes (n)	%
Are you worried about not being able to have dialysis?	30	51.7
Are you afraid of having the infection?	41	70.7
Are you worried about getting infected while going to or in the HD unit?	43	74.1
Do you find it difficult to wear masks?	38	65.5
Do you find it difficult to stay at home?	46	79.3
Are you economically affected?	37	63.8
Did you need to use anti-depressants?	9	15.5

HD: Hemodialysis

Table 3. Pittsburgh sleep quality index, Beck depression inventory, and Beck anxiety inventory scores in the study population, and in patient grouped based on having COVID-19

	All participants	Had COVID-19	Did not have COVID-19	p value
Pittsburgh sleep quality index	5.72±3.28	6.37±3.37	5.41±3.24	0.31
1) Subjective sleep quality	1.03±0.79	1.32±0.82	0.90±0.75	0.05
2) Sleep latency	1.40±0.95	1.79±0.85	1.21±0.95	0.02
3) Sleep duration	0.71±0.99	0.74±1.14	0.69±0.92	0.88
4) Habitual sleep efficiency	0.34±0.76	0.21±0.71	0.41±0.78	0.35
5) Sleep disturbances	1.45±0.62	1.58±0.60	1.38±0.63	0.26
6) Use of sleep medication	0.12±0.46	0.05±0.23	0.15±0.54	0.32
7) Daytime dysfunction	0.62±0.81	0.68±0.94	0.59±0.75	0.70
Beck depression inventory score	14.34±9.74	14.11±9.58	14.45±9.95	0.90
Beck anxiety inventory score	12.65±11.19	12.44±8.59	12.74±12.31	0.92

COVID-19: Coronavirus disease 2019

Table 4. Pittsburgh sleep quality index, Beck depression inventory, and Beck anxiety inventory scores in the study population with respect to demographic data

	Pittsburgh sleep quality index	Beck depression inventory score	Beck anxiety inventory score
Gender			
Male	6.10±3.01	12.90±9.48	12.86±10.98
Female	5.34±3.54	15.89±9.96	12.45±11.57
p value	0.38	0.25	0.89
Marital status			
Married	6.21±3.22	14.63±7.89	12.78±10.14
Single	3.90±1.44	13.00±13.97	9.9±11.46
p value	0.002	0.62	0.43
Education level			
Basic	6.03±3.15	16.24±8.56	12.13±9.64
High-school	4.80±2.54	11.11±10.13	12.45±11.53
University	3.50±3.53	7.50±4.95	7.00±7.07
p value	0.12	0.18	0.56
Household residents			
Husband/wife	7.38±3.75	16.25±7.92	15.69±11.22
Children	3.75±1.70	17.00±12.30	16.00±20.84
Parents	4.10±1.52	9.00±11.30	6.90±3.69
Living alone	5.00±4.00	18.33±15.88	15.67±22.14
Husband/wife and children	5.33±2.68	13.04±7.58	11.43±9.30
p value	0.003	0.044	0.28
Smoking status			
Current smoker	5.36±3.61	11.82±11.25	10.60±13.48
Ex-smoker	6.63±3.77	15.25±8.99	15.25±11.38
Non-smoker	4.96±2.36	14.62±10.01	10.83±9.81
p value	0.20	0.62	0.33
Having household contact with COVID-19			
Yes	6.13±4.47	13.47±10.77	12.93±9.65
No	5.58±2.81	14.66±9.46	12.55±11.80
p value	0.58	0.68	0.91
Families or relatives died with COVID-19			
Yes	5.00±1.41	15.75±13.64	11.75±6.65
No	5.78±3.38	14.23±9.55	12.72±11.50
p value	0.65	0.76	0.86

COVID-19: Coronavirus disease 2019

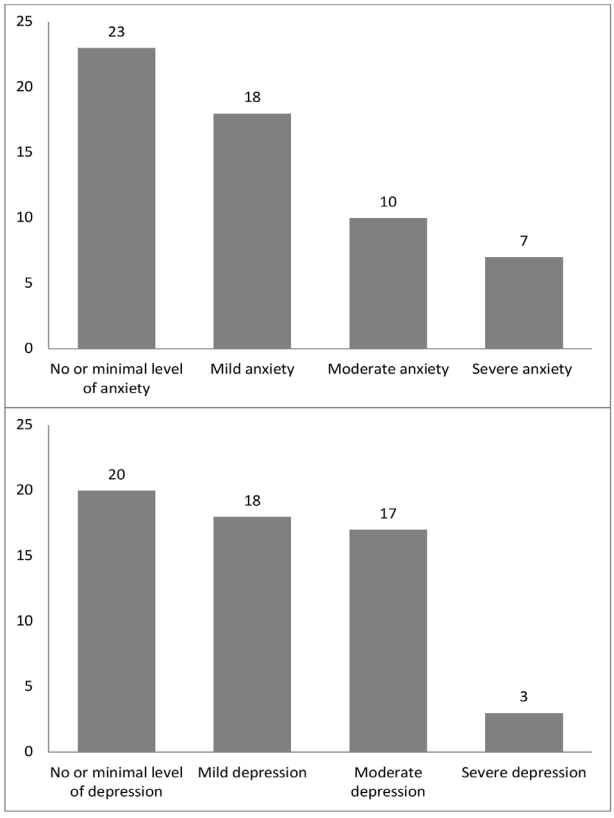

Figure 2. BAI and BDI scores
BAI: Beck anxiety inventory, BDI: Beck depression inventory

concerning demographic data are demonstrated in Table 4.

Discussion

Our results indicate that the current pandemic has affected the lives of HD patients in some respect. These impacts have occurred in health status, social life, or economic conditions. The HD patients who have had the infection seem to have less qualified sleep. In other words, sleep quality seems to be negatively influenced by COVID-19.

The COVID-19 pandemic has had major effects in many aspects of our lives. Avoiding contact to protect themselves and self-isolating to avoid infectious threats have been necessary, but also can lead to isolation and loneliness. Previous reviews have shown that the current pandemic has provoked global stress, anxiety, and depression.[12] People, especially the elderly and those having chronic illnesses have been advised to "stay at home". However, some conditions prevent people from doing so. For example, HD patients are bound to go to hospitals or HD centers. This vulnerable group of patients bears an increased risk of severe infections. CKD is one of the most important risk factors for severe COVID-19. Consistent with this pre-existing data, half of the HD patients with COVID-19 in our study group required hospital admission.

Since the emergence of the virus, news about the pandemic has occupied a huge proportion of news in all kinds of media. It is necessary and inevitable to be informed. However, watching, listening, or reading about the dreadful consequences of the infection might be stressful and overwhelming. Nevertheless, our results indicate that most of the HD patients were not negatively affected by the visual or print media. One possible explanation for this might be the fact that unpredictable and uncertain situations are not easy to cope with. In our HD unit, patients underwent a pandemic education program, and were widely informed about COVID-19 and taught precautionary and preventive measures (such as hygiene, social distancing, wearing masks…). This may decrease the need to follow print and visual media news regarding the pandemic. Being able to find the answers about the disease and have the chance to be informed thoroughly, might have contributed to reducing their worries. Another fact is being attended by a health professional during the HD sessions. This may help them feel safe, supported, and protected, and relieve the feeling of loneliness.

HD patients have planned and dependent lifestyles and they already deal with physical, psychological, social, and occupational facts. The majority do not, or can not, have regular business lives. They are unable to travel or attend social activities as they wish. They have to adjust their lives and cope with troublesome situations. To overcome these difficulties, they need to accept the stressful conditions, have a positive perception, and overcome the stressors. We propose that these underlying adversities have made HD patients more adaptive to the current pandemic. This may be a possible explanation of lower rates of depression and anxiety scores in our study population.

In a study from the Netherlands, the mental health of dialysis patients was evaluated in the first months of the pandemic and was compared to the period preceding the pandemic. The results of the health-related quality of life questionnaire were reported to be unaffected by the COVID-19 pandemic.[13] Our study was conducted after a longer period since the emergence of the pandemic. As time elapsed, the effect of the virus on economics and social life has become apparent.

Poor sleep quality is a major physical and psychosocial burden in HD patients. It is associated with a poor quality of life. In a recent study from China, the PSQI score was found to be a predictor of all-cause mortality in HD and peritoneal dialysis patients. The authors have reported that PSQI above 7 was associated with mortality.[14] Our study revealed that HD patients who had been infected with and recovered from SARS-CoV-2 had poorer quality of sleep. This gives us the power to propose that COVID-19 may be a contributory factor to disturbed sleep. We must emphasize that these patients had no symptoms of long-COVID; therefore, poor sleep quality needs to be attributed to psycho-social factors, rather than physical problems.

Study Limitations

There are some limitations of the current study. The outcomes reflect self-report inventories and are subjective; therefore, a recall bias is a possibility. However, self-reported questionnaires are widely used methods to measure depression and anxiety. Another fact is that pre-covid levels of depression and anxiety of the study population are unknown; thus preceding psychological conditions can not be predicted.

Conclusion

In conclusion, the pandemic can be considered as a health, economic and social burden. Its impacts on patients with chronic illnesses are not only metabolic, but contrarily multifactorial. Sleep quality seems to be one important piece of this puzzle. HD patients should be appropriately evaluated to identify possible consequences of COVID-19 with all aspects.

Ethics

Ethics Committee Approval: The study was approved by the Turkish Republic Ministry of Health and the University of Health Sciences Turkey, Kartal Dr. Lütfi Kırdar City Hospital Clinical Research Ethics Committee (decision no: 2021/514/208/16, date: 25.08.2021).
Informed Consent: All participants signed an informed consent form.

Authorship Contributions

Surgical and Medical Practices: E.P., Concept: E.T.P., Design: E.T.P., Data Collection or Processing: E.P., Analysis or Interpretation: E.T.P., Literature Search: E.T.P., Writing: E.T.P.
Conflict of Interest: No conflict of interest was declared by the authors.
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