

## Evaluation of Symptoms in Hemodialysis Patients during the COVID-19 Pandemic

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### ABSTRACT

**Aim:** The study aims to assess the frequency and severity of the symptoms that HD patients experience during the COVID-19 pandemic and to identify the socio-demographic factors affecting these symptoms.

**Method:** This descriptive and cross-sectional study aims to assess the frequency and severity of the symptoms that HD patients experience during the COVID-19 pandemic and to identify the socio-demographic factors affecting these symptoms. 41 hemodialysis patients meeting the sampling criteria were included in the study after agreeing to participate. Data were collected using a personal information form prepared in accordance with the relevant literature and the Dialysis Symptom Index (DSI). SPSS 25.0 software was used for data analysis.

**Results:** It was found out that the mean age of the patients was 55.63±2.43, 56.1% of them were male, and 12.2% of them had COVID-19 disease. It was determined that the mean DSI total score of the patients was 48.17±2.80. The most commonly observed symptoms in the patients were fatigue 97.6%, headache, and difficulty in falling asleep 82.9%.

**Conclusion:** It was concluded that elderly, literate, male, married, unemployed, chronically ill patients, those who have been receiving HD treatment for 3 years or more, and those who depend on others for daily activities experienced more symptoms.

**Keywords:** COVID-19 pandemic, hemodialysis patients, life quality.

## Covid-19 Pandemisinde Hemodiyaliz Hastalarında Görülen Semptomların Değerlendirilmesi

### ÖZ

**Amaç:** Bu çalışma, COVID-19 pandemisi sürecinde hemodiyaliz (HD) tedavisi alan hastaların yaşadıkları semptomların sıklığını ve şiddetini değerlendirmeyi ve bu semptomları etkileyen sos-demografik faktörleri belirlemeyi amaçlandı.

**Yöntem:** Çalışma tanımlayıcı ve kesitsel tipte yapıldı. Araştırmaya örneklem kriterlerine uyan ve araştırmaya katılmayı kabul eden 41 hemodiyaliz hastası alındı. Araştırma verileri ilgili literatür doğrultusunda oluşturulmuş kişisel bilgi formu ve Diyaliz Semptom İndeksi (DSI) ile toplandı. Verilerin analizinde SPSS 25.0 paket programı kullanıldı.

**Bulgular:** Hastaların yaş ortalamalarının 55.63±2.43 olduğu, %56.1'inin erkek cinsiyette olduğu ve %12.2'sinin COVID-19 hastalığı geçirdiği saptandı. Hastaların DSI toplam puan ortalamasının 48.17±2.80 olduğu belirlendi. Hastalarda görülen en yaygın semptomun yorgunluk (%97.6), baş ağrısı ve uykuya dalmada zorluk (%82.9) olduğu belirlendi.

**Sonuç:** Bu çalışmada ileri yaş, okur-yazar olan, erkek cinsiyette, evli olan, çalışmayan, kronik hastalığı olan, günlük yaşam aktivitelerinde bağımlı olan ve 3 yıl ve üzerinde hemodiyaliz tedavisi alan hastaların daha fazla semptom deneyimledikleri belirlendi.

**Anahtar Kelimeler:** COVID-19, pandemi, hemodiyaliz hastaları, yaşam kalitesi

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## INTRODUCTION

Hemodialysis (HD) is the procedure of returning the blood extracted from the patient through vascular access back to the patient after regulating the fluids and electrolytes, and cleaning the waste off the blood with an external machine (Yürügen et al., 2015). A side from compensating for the lost kidney functions, the aim of the HD treatment is to increase the life quality of patients to an optimal level (Akin et al., 2010). According to the report of the International Society of Nephrology, it is estimated that there will be 5.4 million dialysis patients across the world by the year 2030 (ISN, 2016) in the joint report prepared by the Turkish Society of Nephrology and Ministry of Health, it is reported that the number of patients receiving renal replacement treatment has a tendency to increase and that this number is 61.341 as of 2019 (TND, 2019).

Numerous physical and psychosocial symptoms related to chronic kidney disease (CKD) and its treatment develop in hemodialysis patients. Symptoms experienced by HD patients include fatigue, ache, muscle cramps, nausea, vomiting, constipation, diarrhea, pruritus, dry skin, sleep disorder, emotional and sexual issues (Moledina & Perry Wilson, 2015). These symptoms and their severity vary with each patient, as the severity and frequency of symptoms increase, patients get hopeless and anxious about the future, and life quality and hope for the future are deteriorating. A study examining HD patients has concluded that the most commonly observed symptoms were bone/joint pain, insomnia, emotional disorder, sexual dysfunction, paresthesia, and nausea (Hindistan and Deniz, 2018).

Another study reported fatigue, low energy levels and headache, bone and joint pain as the most common symptoms (Akgöz and Arslan, 2017). The COVID-19 is a serious pandemic that threatens the lives of millions of people around the world. The number of people who contracted COVID-19 around the world so far is 575 million and there are 6.3 million death cases (WHO, 2022). The fact that most of the hemodialysis patients are middle-aged and elderly, that many of them have additional chronic diseases (diabetes, hypertension, etc.), that their immune systems are weak, and that they visit the clinic 2 or 3 times a week to receive treatment as an outpatient or transfer patient, makes them one of the patient groups that are most susceptible to COVID-19 disease (Hao et al., 2021; Mardomi and Khosroshahi 2021; Medjeral-Thomas et al., 2020). In a retrospective study, it was reported that HD patients with COVID-19 (n=36) developed bilateral pneumonia seven days after the symptom onset, and 61.1% of the patients passed away (Goicoechea et al., 2020). HD patients are reported to be in the COVID-19 risk group and their death rates are higher than the general population since they have to regularly visit health institutions to receive hemodialysis treatment, some of them have additional chronic diseases such as diabetes, hypertension, and they have a weaker immune system (Medjeral-Thomas et al., 2021; Ordin, 2020; Watnick and McNamara, 2020). The fact that hemodialysis (HD) patients are at higher risk from COVID-19 and that their mortality rate is higher in terms of COVID-19 infection disease causes patients to have many symptoms such as being nervous, anxious, have sleep problems, and psychological problems (Bonenkamp et al., 2021).

Evaluating the life quality of hemodialysis patients and considering symptom management as an important part of the treatment will not only prolong the life span of the patients but also rehabilitate them and increase their quality of life. As members of the health care team, nurses are responsible for educating, caring for, counseling, and organizing the care of hemodialysis patients. Good nursing care aims to plan and implement appropriate interventions to relieve the patient both physically and emotionally, to ensure the biological, psychosocial, and sociocultural well-being of patients, and to enhance their life quality (Üstün and Karadeniz, 2006). During the COVID-19 pandemic, the factors affecting the treatment and care process of HD patients and the symptom management of patients are important. This study was conducted to assess the frequency and severity of the symptoms experienced by HD patients during the COVID-19 pandemic and to identify the socio-demographic factors along with others influencing these symptoms.

## **METHOD**

The study was conducted in a descriptive and cross-sectional fashion in order to assess the symptoms observed in patients receiving hemodialysis treatment.

### **Study design and participants**

The study population consisted of all patients (56) receiving dialysis treatment in a government hospital in southern Turkey, and the sample consisted of 41 (73%) patients who matched the study criteria and agreed to participate in the study. All patients receiving HD treatment in the hospital are followed up once a month by a dietician and a psychologist. Transportation to dialysis treatment is provided by a service the hospital uses for dialysis patients. Patients receiving hemodialysis treatment due to chronic renal failure, conscious, over 18 years of age, without communication problems or psychiatric disorder, and consented to participate in the study were included in the study.

### **Data collection and data collection tools**

Research data were collected between July 1 and September 1, 2021, at a training and research hospital in southern Turkey. Research data were collected both in person and from the patient record by a hemodialysis nurse trained in research data collection. It took about 10-15 minutes to collect the research data. Data were collected through a personal information form prepared in accordance with the relevant literature and the Dialysis Symptom Index (DSI).

Personal Information Form is a form consisting of 12 questions regarding the patient's age, gender, educational status, socioeconomic status, course of the COVID-19 disease, and dialysis treatment in a form created by the researcher after a literature review.

Dialysis Symptom Index (DSI); It was developed by Weisbord et al. (2004) to assess physical and emotional symptoms and their severity. DSI contains 30 symptoms, each referring to a specific physical or emotional indication. For the questions regarding symptoms experienced in the last seven days, there are two options, which are yes and no; if the patient picks yes as an answer, then they assess the severity of the symptom with a 5-point Likert scale as 1=not at all, 2=a little bit, 3=somewhat 4=quite

a bit, 5=very much. The overall score is the sum of the points. The overall score varies between 0–150. A total score of 0 implies patient doesn't have any symptoms. The rise in the total scores given to the answers towards 150 points indicates that the effect of the mentioned symptom has increased. (Önsöz and Usta Yeşilbalkan, 2013). The adaptation, reliability, and validity of the Turkish DSI were performed by Önsöz and Usta Yeşilbalkan (2013). DSI kappa values were measured as 0.10 and 0.93, and Cronbach's alpha coefficient was calculated as 0.83.

### Data analysis

Data were analysed using SPSS 25.0 software, and scale reliability was assessed using Cronbach's alpha coefficients. The Cronbach's alpha value of the scale was measured as 0.98. Demographic characteristics of hemodialysis patients were analysed with frequency, percentage, and mean values. According to the applied Kolmogorov-Smirnov test, the mean values of DSI did not distributed normally ( $p < 0.05$ ). Kruskal Wallis test, Mann whitney U test were used for the data analysis. A value of  $p < 0.05$  was considered statistically significant.

### Ethical considerations

Approval for the conduct of the study was acquired from the ethics committee of the university (Approval No: 2021-5, 01.07.2021). The verbal and written consent was obtained from the participants. It was conducted in compliance with the ethics guidelines set out in the Declaration of Helsinki.

## RESULTS

It was found that the mean age of patients was  $55.63 \pm 2.43$  years, 56.1% were male and 85.4% were married. 58.5% of the patients were literate, 87.8% were not employed, and 68.3% had a balanced financial status. It was concluded that there was a significant correlation between the age group, gender, education level, and employment status, and the total DSI score of the patients ( $p < 0.05$ ). (Table 1).

**Table 1. Mean DSI scores of the patients based on their socio-demographic characteristics**

| Demographic Characteristic |           |             |               |
|----------------------------|-----------|-------------|---------------|
| Age (X±SD) 55.63±2.43      | n (%)     | X ± SD      | P             |
| <b>Age Group</b>           |           |             |               |
| 18-25                      | 2 (4.9)   | 31±2.82     | <b>0.01*</b>  |
| 26-40                      | 5 (12.2)  | 43.20±16.37 |               |
| 41-64                      | 17 (41.5) | 41.23±12.66 |               |
| ≥ 65                       | 17 (41.5) | 58.58±19.15 |               |
| <b>Gender</b>              |           |             |               |
| Male                       | 23 (56.1) | 42.69±16.34 | <b>0.01**</b> |
| Female                     | 18 (43.9) | 55.16±17.88 |               |
| <b>Marital Status</b>      |           |             |               |
| Married                    | 35 (85.4) | 50.00±17.64 | 0.09          |
| Single                     | 6 (14.6)  | 37.50±17.16 |               |

**Table 1. (continued)**

| <b>Education Level</b>     |           |             |             |
|----------------------------|-----------|-------------|-------------|
| Literate                   | 24 (58.5) | 54.91±18.04 | <b>0.01</b> |
| Primary school             | 6 (14.6)  | 40.33±14.32 |             |
| Middle school              | 9 (22.0)  | 39.77±13.20 |             |
| University                 | 2 (4.9)   | 28.50±10.60 |             |
| <b>Income Level</b>        |           |             |             |
| Income exceeding outgoings | 9 (22)    | 58.66±18.67 | 0.09        |
| Income equal to outgoings  | 28 (68.3) | 46.50±16.45 |             |
| Income less than outgoings | 4 (9.8)   | 36.25±19.60 |             |
| <b>Working Status</b>      |           |             |             |
| Working                    | 5 (12.2)  | 31.20±6.90  | <b>0.02</b> |
| Not working                | 36 (87.8) | 50.52±17.77 |             |

\* Kruskal Wallis Test , \*\*Mann Whitney U Test

The mean DSI score was 48.17±2.80, and the total score of patients ranged from 9 to 86, with a Cronbach's Alpha value of 0.98 (Table 2).

**Table 2. Distribution of DSI total scores of the patients**

|     | <b>Number of question</b> | <b>Mean ± SD</b> | <b>Min-Max (median)</b> | <b>Cronbach's Alpha</b> |
|-----|---------------------------|------------------|-------------------------|-------------------------|
| DSI | 30                        | 48.17 ± 2.80     | 9- 86 (48)              | 0.98                    |

70.7% of the patients had a chronic disease, 43.9% were semi-dependent in daily activities, 43.9% had received dialysis treatment for less than one year, and 12.2% had went through COVID-19 disease. It was found that all dialysis patients had a mild course of COVID-19 disease (Table 3). It was determined that there was a significant correlation between the patients' ability to perform daily activities, the duration of dialysis, and the incidence of chronic diseases and DSI (Table 3) ( $p<0.05$ ).

**Table 3. Mean DSI scores of the patients based on various characteristics of the patients**

| <b>Activities of Daily Living</b>   | <b>n (%)</b> | <b>X ± SD</b> | <b>P</b>    |
|-------------------------------------|--------------|---------------|-------------|
| Independent                         | 12 (29.3)    | 38.16±13.66   | <b>0.00</b> |
| Semi-dependent                      | 18 (43.9)    | 43.00±14.59   |             |
| Dependent                           | 11 (26.8)    | 67.54±11.85   |             |
| <b>Dialysis Time</b>                |              |               |             |
| Less than a year                    | 18 (43.9)    | 44.33±17.07   | <b>0.02</b> |
| 1-3 year                            | 15 (36.6)    | 44.66±15.35   |             |
| 3 year and above                    | 8 (19.5)     | 63.37±18.25   |             |
| <b>Chronic Disease</b>              |              |               |             |
| Yes                                 | 29 (70.7)    | 53.89±17.18   | 0.00        |
| No                                  | 12 (29.3)    | 34.33±11.18   |             |
| <b>COVID-19 Disease</b>             |              |               |             |
| Yes                                 | 5 (12.2)     | 42.80±15.78   | 0.44        |
| No                                  | 36 (87.8)    | 48.91±18.30   |             |
| <b>Fear of the COVID-19 Disease</b> |              |               |             |
| Yes                                 | 36 (87.8)    | 48.91±18.30   | 0.44        |
| No                                  | 5 (12.2)     | 42.80±15.78   |             |

The symptoms experienced by the patients according to the DSI are seen in Table 4. Reportedly, 97.6% of the patients felt fatigued, 82.9% of them suffer from headaches and have difficulty in falling

asleep, 85% of them had poor concentration and decreased interest in sex. It was concluded that coughing (4.9%) was the least observed symptom in HD patients.

**Table 4. Symptoms observed patients according to DSI**

| Symptoms                          | n (%)     | X ± SD    |
|-----------------------------------|-----------|-----------|
| Constipation                      | 4 (9.8)   | 3.00±0.00 |
| Nausea                            | 7 (17.1)  | 3.00±0.37 |
| Vomiting                          | 4 (9.8)   | 3.00±0.50 |
| Decreased appetite                | 21 (51.2) | 3.09±0.43 |
| Muscle cramps                     | 22 (53.7) | 3.00±0.00 |
| Swelling in the legs              | 11 (26.8) | 2.90±0.30 |
| Shortness of breath               | 9 (22.0)  | 3.11±0.33 |
| Dizziness                         | 27 (65.9) | 3.00±0.00 |
| Difficulty keeping legs still     | 21 (51.2) | 3.00±0.49 |
| Numbness in the feet              | 28 (68.3) | 3.07±0.37 |
| Feeling tired                     | 40 (97.6) | 3.15±0.53 |
| Cough                             | 2 (4.9)   | 3.00±0.00 |
| Dry mouth                         | 16 (39.0) | 2.93±0.25 |
| Bone or joint pain                | 31 (75.6) | 3.06±0.35 |
| Chest pain                        | 6 (14.6)  | 3.00±0.00 |
| Headache                          | 34 (82.9) | 3.02±0.17 |
| Muscle pain                       | 29 (70.7) | 3.06±0.37 |
| Difficulty concentrating          | 33 (80.5) | 3.42±0.83 |
| Dry skin                          | 16 (39.0) | 3.06±0.57 |
| Itching                           | 7 (17.1)  | 2.85±0.37 |
| Worry                             | 30 (73.2) | 3.06±0.36 |
| Feeling angry                     | 19 (46.3) | 3.21±0.63 |
| Difficulty falling a sleep        | 34 (82.9) | 2.97±0.17 |
| Difficulty staying a sleep        | 28 (68.3) | 2.92±0.26 |
| Feel uncomfortable                | 25 (61.0) | 3.08±0.40 |
| Dont feel sad                     | 21 (51.2) | 3.09±0.43 |
| Feeling anxious                   | 32 (78.0) | 3.06±0.35 |
| Decreased interest in sex         | 33 (80.5) | 4.03±1.01 |
| Difficulty being sexually aroused | 31 (75.6) | 4.09±1.01 |

## DISCUSSION

HD patients must cope with many symptoms during treatment and experience changes that can affect their daily activities, family and work life, social role changes, body image, and self-esteem. The mean DSI score of the patients measured as  $48.17 \pm 2.80$  was found to be higher than those of other studies on the subject (Akgöz and Aslan, 2017; Durmaz Akyol, 2016). According to the research results, it can be said that patients experience more symptoms during the COVID-19 pandemic process. In the study, it was determined that the most common and severe symptom experienced by patients during the COVID-19 pandemic was fatigue (97.6%), followed by headache and difficulty falling asleep (82.9%). The least observed symptoms in patients were coughing, vomiting, constipation and chest pain. Many studies have revealed that fatigue, headache, and sleep disorder are among the most common symptoms in HD patients (Abdel-Kader et al., 2009; Akgöz and Aslan 2017; Göriş et al., 2016; Hindistan and Deniz 2018; Özkan and Taylan 2020). Although the pathogenesis of fatigue in chronic dialysis patients is not yet known, it is estimated to be due to many physiological processes, such as adjustment of electronic fluid balance, endocrine functions, anemia, and malnutrition (Akgöz and Aslan, 2017).

Fatigue can cause dysfunction in individuals and in the performance of daily activities due to lack of energy. As the severity of the fatigue increases, individual's ability to perform their activities decreases. According to the literature, the prevalence of fatigue in HD patients varies between 45% and 80% (Bossola et al., 2011). Since fatigue is one of the most common symptoms in dialysis patients, management of fatigue is one of the most important nursing interventions because of its positive impact on an individual's life, relationships and daily activities. Investigating the reasons behind fatigue being the most common symptom and implementing care and treatment interventions for fatigue will reduce the frequency of this symptom and improve functionality and life quality of the patient. One study reported that chronic diseases such as coronary artery disease, congestive heart failure, diabetes, and pulmonary disease were associated with sleep disorders (Elder et al., 2008). In accordance with this literature information, it was determined that individuals with chronic diseases tend to experience more dialysis symptoms. In a study conducted on patients awaiting kidney transplantation, it was reported that during the COVID-19 pandemic, patients had high levels of stress, poor sleep quality, and more problems with insomnia (Barutcu Atas et al., 2021). Because symptoms such as fatigue, headaches, and sleep disturbances impact an individual's overall life and relationships, as well as physical and mental processes, developing plans and interventions to manage these symptoms for patients is an important step in symptom management.

In the study, it was concluded that that older, literate, female, married, and unemployed patients experienced more symptoms. In another research, similar to this study, it was reported that older, female, married and unemployed HD patients experience more symptoms (Hindistan and Deniz, 2018). In another study, it was reported that more symptoms are seen in the people of older age group (Göriş et al., 2016). Similar to the findings of this study, some studies have reported that more symptoms are observed in women (Akgöz and Aslan, 2017; Caplin et al., 2011; Göriş et al., 2016). The fact that more symptoms are observed in females in this study and that social roles and responsibilities also persist during pandemic might be due to the mandatory restrictions and quarantine procedures in this process, as they affect the social relationships, work, and benefits of other health services.

According to the findings of the study, patients with a chronic disease, who depend on others for daily activities, who received dialysis treatment for 3 years or more, had more symptoms. One study concluded that although more symptoms were observed in patients with chronic disease, the duration of dialysis had no effect on the occurrence of symptoms (Akgöz and Aslan, 2017). This result can be explained by the fact that patients with chronic diseases who rely on others for their daily activities because they have difficulty caring for themselves experience more symptoms.

Two of the most important findings of this study were that most HD patients (87.8%) stated that they were afraid of contracting COVID-19 and that all patients reported that they did not experience any disorders or anxiety during HD treatment. No significant correlation between patient anxiety and dialysis symptoms was found in the study. Anxiety is a pent-up emotion that is experienced when people encounter danger and are unable to get rid of it. The psychological pressure caused by excessive panic



may cause new symptoms to occur in the disease. It is known to affect growth and development, genital system, respiratory function, digestive system, and mental and emotional activities by affecting the neuro-endocrine system and immune system, and hypochondria, depression, and other emotions may be triggered in individuals who experience long-term anxiety (Liu et al., 2021). In a study conducted on a large sample group, 44% of HD patients were discovered to fear COVID-19 above the average (Warren et al., 2021). Fear is one of the initial reactions of people to a rapidly spreading contagious disease. Fear of COVID-19 may cause behaviors that are beneficial for public health as it may reduce contagion as well as bad reactions such as being stigmatized and prejudice (Winter et al., 2020). It has been suggested that the feeling of anxiety that arose during the COVID-19 pandemic was caused by the thought of getting infected and losing the fight against the disease and that this thought is one of the most important factors that lead patients to have more symptoms.

The fact that the COVID-19 pandemic has brought many changes in daily life, especially in social interactions, interpersonal relationships, that it has individual differences over the course of the disease, and that it has many new and unknown aspects makes this period we are going through cause stress and anxiety. In the study, no significant correlation was found between DSI scores of individuals who have had COVID-19 disease and those who have fear of contracting the disease. While it is suggested that the limited sample may have influenced this outcome, it was estimated that psychological support for patients may have a positive impact on the symptomatic status of patients during the pandemic.

The most important limitation of the study is its small sample size. Furthermore, because the correlation between dialysis symptoms and other variables was not studied in the same patients before the pandemic, it is difficult to infer a causal correlation between the variables.

## CONCLUSION

It was concluded in this study that fatigue, headaches, and having difficulty in falling asleep were the most common symptoms in HD patients. It was revealed that elderly, literate, female, married, unemployed, chronically ill patients, those who depend on others for daily activities, and those who have been receiving HD treatment for 3 years or more experienced more symptoms. In addition, the vast majority of patients were found to be afraid of contracting COVID-19 disease.

## RECOMMENDATIONS

- In this regard, providing interdisciplinary, individual-centered cooperation in the treatment and management of symptoms in HD patients may improve the satisfaction and life quality of the patients. For this reason, it is important to recognize and assess the dialysis symptoms of all HD patients and those with COVID-19 disease to optimize patient care and treatment management.
- We think that conducting a study with a larger sample group and other descriptive data will contribute to the literature.



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