

The effect of COVID-19 fear on hygiene behaviors in hemodialysis patients during the COVID-19 pandemic

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ABSTRACT

Aim: Current study aims to specify the fear levels and hygiene habits of hemodialysis (HD) patients infected or not infected with coronavirus disease 2019 (COVID-19) in the course of the COVID-19 pandemic.

Material and Method: This study was performed between 15-30 April 2021 as a case-control study whose population consisted of 124 dialysis patients treated in the dialysis unit of Batman Education and Research Hospital. In the dialysis unit, while 25 HD patients who were not present with COVID-19 were included in the control group, 25 dialysis patients were diagnosed with COVID-19 and agreed to participate in the study were included in the case group. "Patient Descriptive Form", "COVID-19 Hygiene Scale (CHS)" and "COVID-19 Fear Scale (CFS)" were used to collect the study data.

Results: While the mean score of the Changing Hygiene Behaviors sub-dimension of the HD patients in the case group was 23.72 ± 4.90 ; the mean score of the same sub-dimension belonging to the HD patients in the control group was determined as 22.40 ± 5.25 , and there was no statistically meaningful difference between the two groups. The mean CFS score of the HD patients in the case group was 13.60 ± 7.92 ; while the mean CFS score of the HD patients in the control group was found to be 17.72 ± 7.43 . No statistically meaningful difference was observed between the two groups.

Conclusion: The mean CFS and CHS scores of the HD patients in the control group were higher, but no statistically meaningful difference was observed between the two groups.

Keywords: Fear levels, hygiene habits, hemodialysis, coronavirus disease 2019

INTRODUCTION

Hemodialysis is an extracorporeal blood purification procedure resorted to filtering uremic substances in the blood in chronic kidney disease (CKD) (1). CKD is characterized by the progressive and irreversible loss of nephrons, and metabolic and also hormonal dysfunction is present in the kidneys, thus adversely affecting the balance of fluid, electrolytes, and other shaped elements in the urine (2). The principle behind HD is based on the displacement of molecules from high concentrations to low ones until the concentration of small molecules that can pass through the membranes equalizes on both membrane surfaces (3).

Today, the number of CKD patients in our country is over 83,000 and according to 2019 data, CKD treatment is provided with HD at a rate of 73.21% (1, 4). It is

thought that the number of CKD patients undergoing HD has increased 2.5 times in the last 15 years, and it is known that the majority of patients are waiting for kidney transplantation. It is estimated that there are around 3.5 million CKD patients awaiting kidney transplantation worldwide and that approximately 10% of the world's population suffers from CKD, CKD ranks third among the causes of mortality (5).

Chronic kidney disease patients routinely come to hospitals or HD centers to receive HD treatment 3 times a week. Being an HD patient is an extremely stressful and tiring experience, which significantly threatens individual independence, weakens the workforce, as well as disrupts psychological state, while reducing comfort as well as the quality of life, and limit social life (1, 6). During the pandemic, the already difficult lives of HD patients may have become even more problematic (7).

COVID-19, which causes viral pneumonia, is a coronavirus and was called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) because of its resemblance to the SARS virus (8, 9). COVID-19, which causes SARS, is a destructive disease that arises in Wuhan, China towards the end of 2019, the disease has given rise to a global pandemic and people still sense its devastating impacts. World Health Organization declared the epidemic caused by SARS-CoV-2 as a pandemic in March 2020, since it has influenced large human populations (10). The available studies in the literature have shown that HD patients are in the risk group in this process and that this group of patients is severely affected by the COVID-19 virus, just like in other chronic diseases. It has been stated in studies that those with at least one chronic disease are among the groups that increase the fatality rates in the COVID-19 pandemic anywhere in the world and in our country (8,9). In the literature, 23.7% of COVID-19 patients were found to be accompanied by at least one chronic disease (11), the COVID-19 virus was more common in individuals with chronic disease (51%), and the disease symptoms caused by the virus had a more severe course (12,13), and also that 48% of patients with COVID-19 virus were present with comorbidities (9).

Chronic kidney disease generally leaves significant effects on the lives of patients. It is known that the social performance of CKD patients decreases, they have difficulty in fulfilling their family roles and professional responsibilities, and their sexual life deteriorates due to the disease (14, 15). The pandemic process and the threat of COVID-19 may urge CKD patients to think about the fear of death. Fear and depression may cause loss of control in patients in general, coupled with inner withdrawal as well as the preconceived idea that the use of drugs may be unnecessary, weakening the immune system (16). The life motivation and adaptation of CKD patients who experience intense stress accompanied by fear may be weakened. HD patients, who are more exposed to infectious agents and virus threats than other individuals due to their frequent clinic visits, may become infected when hygiene is missing. HD patients who can easily become infected due to a lack of hygiene can also pass away. COVID-19 contamination can cause individuals to become infected more rapidly in the existence of the chronic disease or aggravate the course of the disease, even if there are hygiene and distance limits set between people. Therefore, COVID-19 may be riskier in the HD patient group, a chronic disease (17). It is thought that there is a relationship between the hygiene habits of HD patients and COVID-19 during the pandemic caused COVID-19 in this study. In this study, it was purposed to examine the relationship between fear of COVID-19 and hygiene habits of CKD patients.

Main Points

1. Hemodialysis patients who do not have COVID-19 have higher fear levels.
2. Hygiene behaviors of HD patients who do not have COVID-19 are higher.
3. The mean CFS and CHS scores of the HD patients in the control group were higher, but no statistically meaningful difference was observed between the two groups. The high fear of patients without Covid 19 disease may be due to their ignorance of the complications of the disease.

MATERIAL AND METHOD

This single-center, questionnaire study was designed in accordance with the Declaration of Helsinki, with the approval of the Batman University Ethics Committee (Date: 09.04.2021, Decision No: 2021/01-12). This study purposes to establish the fear levels and hygiene habits of HD patients infected or not infected with COVID-19 along with the COVID-19 pandemic.

Study Design and Participants

This study was conducted between 15-30 April 2021 as a case-control study whose population consisted of 124 dialysis patients treated in the Dialysis Unit of Batman Education and Research Hospital. In the dialysis unit, 35 dialysis patients were recognized with COVID-19. At the time of the study, 7 patients passed away, 2 patients were receiving treatment in the intensive care unit and 1 patient was excluded as we could not communicate with him (**Figure 1**). 25 HD patients who met the study criteria and were approved to participate in the study were included in the case group, while 25 HD patients who were not present with COVID-19 were included in the control group.

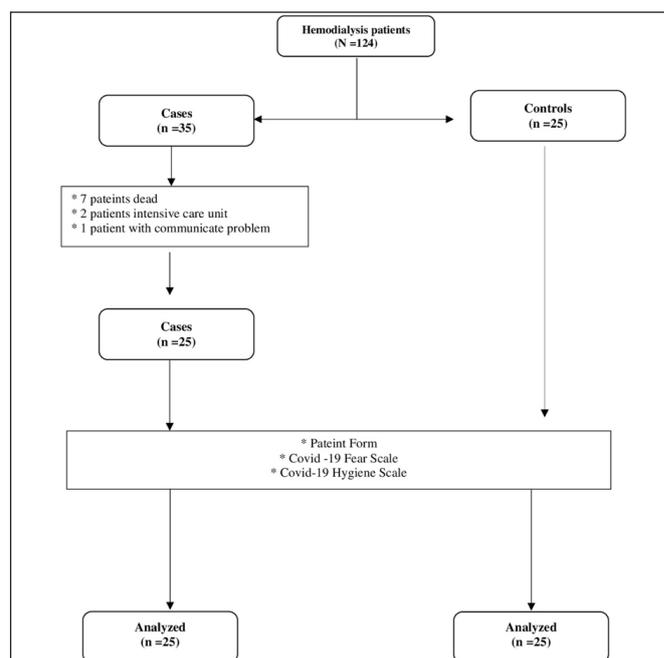


Figure 1. Study flow diagram

Inclusion Criteria

- i. Not having any connection problems.
- ii. Approving joining the study
- iii. Hemodialysis patients with and without COVID-10 were included in the study.

Data Collection Tools

"Patient Descriptive Form", "COVID-19 Fear Scale (CFS)" and "COVID-19 Hygiene Scale (CHS)" were used to collect the study data. The Patient Descriptive form consists of 9 questions on the patient's demographic data such as education status, age, gender, family type, income status, presence of any chronic disease other than CKD, COVID-19 test status, COVID-19 and CKD status in relatives.

COVID-19 Fear Scale

Ahorsu et al. (18) developed a scale to quantify the fear levels of individuals arising from COVID-19. The substances of the scale originated derived from an exhaustive review of existent scales on fear, expert assessments, and participant interviews. While Turkish adaptation of the scale was carried out by Satici et al. (19) the Cronbach alpha internal consistency coefficient was observed to be 0.84.

The scale has a single factor system and comprises 7 items in a five-point Likert type (1 = I strongly disagree; 5 = I strongly agree). There is no test-oriented substance on the scale. The internal consistency of the scale and the test-retest credibility were calculated as 0.82 and 0.72, respectively. A high score on the scale indicates a high fear of COVID-19. In this study, the Cronbach Alpha value was determined as 0.91.

COVID-19 Hygiene Scale

COVID-19 Hygiene Scale which was created by Çiçek et al. (20) in order to determine the hygiene behaviors of individuals during the COVID-19 epidemic process consists of 6 sub-dimensions and 27 items. While the "Changing Hygiene Behaviors" sub-dimension consists of 6 items (7th, 11th, 12th, 14th, 21st, and 27th items), the Home Hygiene sub-dimension consists of 4 items (16th, 18th, 19th, and 20th items), Social Distance and Mask Wear sub-dimension consists of four items (1st, 2nd, 3rd, and 25th items), Shopping Hygiene sub-dimension consists of 5 items (15., 22., 23., 24. and 26. items), Hand Hygiene sub-dimension consists of five items (4th, 5th, 6th, 8th and 9th items) and lastly, Hygiene When Coming Home from Outside sub-dimension consists of three items (10th, 13th, and 17th items). The scale is a 5-point Likert scale (1- never, 5- always). The highest and the lowest scores acquired from the scale were 135 and 27, respectively. The high

score indicates that individuals have a high level of behavior related to personal and general hygiene in order to protect themselves from the epidemic and give importance to hygiene measures. The Cronbach alpha value obtained in the study was 0.90.

Data Analysis

After being coded by the researchers, the data were subjected to statistical analysis using SPSS (Statistical Packed for The Social Sciences) 25.0 IBM statistical software. The analysis of data was calculated on the basis of descriptive statistics. Since the data was suitable for normal distribution, ANOVA and t-tests were applied to independent groups from parametric tests. Pearson correlation analysis was executed to ascertain the relationship between descriptive features and scales. Scale Reliability Coefficient was identified in the form of Cronbach's Alpha. The evaluation of the procured outcomes, $p < 0.05$ error level, and 95% confidence interval were taken into consideration.

Ethical Aspect of the Study

The aim of the study was expressed to the patients who were identified as suitable for inclusion in this study. They were also informed about patients are optional and that they can opt-out anytime they want. Patients participating in the survey were reassured that their personal information will not be disclosed to others, and their affidavits for confidentiality are signed.

RESULTS

The comparison of the descriptive characteristics of the control and case groups of HD patients is presented in Table 1. According to **Table 1**, there wasn't any statistical difference in terms of gender, age, marital status, income status, chronic disease status, or COVID-19 test status of the HD patients participating in the study ($p > 0.05$). A statistically substantial difference was defined between the educational status of the patients in the case and control groups undergoing HD (In other words, high school graduate patients are more involved in the control group than in the case group.) ($p < 0.05$), (**Table 1**). The comparison of CFS and CHS sub-dimension and total mean scores of the patients in the case-control group of HD patients is given in **Table 2**. While the mean CFS score of the HD patients in the control group 17.72 ± 7.43 ; the mean CFS score of the HD patients in the case group was found to be 13.60 ± 7.92 . Any statistically significant difference wasn't detected between the two groups. However, the mean CRF scale scores of the HD patients in the control group were higher (**Table 2**).

Table 1. Comparison of the descriptive features of the case and control groups in hemodialysis patients

Variables	Case n (%)	Control n (%)	Sig. (2-tailed)	P
Gender			X ² = 1.299	0.254
Female	16 (32.0)	12 (24.0)		
Male	9 (18.0)	13 (26.0)		
Age (years)			X ² = 3.346	0.062
Below 64	17 (34.0)	21 (42.0)		
Above 65	9 (18.0)	3 (6.0)		
Marital status			X ² = 14.266	0.001
Married	24 (48.0)	12 (24.0)		
Single	1 (2.0)	13 (26.0)		
Education level			X ² = 7.714	0.06
Illiterate	15 (30.0)	6 (12.0)		
Primary school	8 (24.0)	13 (26.0)		
High school	1 (2.0)	5 (10.0)		
Universty	1 (2.0)	1 (2.0)		
Income level			X ² = 0.083	0.959
Poor	13 (26.0)	12(24.0)		
Middle	11 (22.0)	12 (24.0)		
High	1 (2.0)	1 (2.0)		
Presence of chronic illness			X ² = 1.299	0.254
Yes	16 (32.0)	12 (24.0)		
No	9 (18.0)	13 (26.0)		
Diabetes mellitus			X ² = 0.015	0.574
Yes	8 (16.0)	7 (14.0)		
No	18 (36.0)	17 (34.0)		
Hypertension			X ² = 2.039	0.126
Yes	15 (30.0)	9 (16.0)		
No	11 (22.0)	15 (30.0)		
Cardiovascular diseases			X ² = 0.952	0.329
Yes	2 (4.0)	4 (8.0)		
No	24 (48.0)	20 (40.0)		
The status of performing COVID-19 test			X ² = 0.397	0.754
Yes	19 (38.0)	17 (47.0)		
No	6 (12.0)	8 (16.0)		
The status of their relatives being diagnosed with COVID-19			X ² = 0.0001	0.999
Yes	7 (14.0)	7 (14.0)		
No	18 (36.0)	18 (36.0)		

The mean score of the Changing Hygiene Behaviors sub-dimension of the HD patients in the control group was 22.40±5.25; while the mean score of the Changing Hygiene Behaviors sub-dimension of the HD patients in the case group was determined as 23.72±4.90, and there was no statistically meaningful difference between the two groups. However, the mean scores of the Changing Hygiene Behaviors sub-dimension of the HD patients in the case group were found to be higher. Home Hygiene sub-dimension score of HD patients in the control group was 16.76±3.09; while the mean in the case group was found to be 16.36±3.60, and the difference between the two groups was not statistically meaningful (Table 2). On the other hand, the mean scores of the Home Hygiene sub-dimension of the HD patients in the control and case groups were almost equal to each other.

Table 2. Comparison of the COVID-19 fear scale and COVID-19 hygiene scale sub-dimensions and total mean score of hemodialysis patients in the case and control groups

Variables	n	X ±Sd	Sig. (2-tailed)	P
COVID-19 Fear Scale			U=380.000	0.186
Cases	25	13.60±7.92		
Control	25	17.72±7.43		
Changing hygiene behaviors in the pandemic			U=264.000	0.344
Cases	25	23.72±4.90		
Control	25	22.40±5.25		
Home hygiene			U=326.000	0.786
Cases	25	16.36±3.60		
Control	25	16.76±3.09		
Social distance and wear of masks			U=342.000	0.553
Cases	25	17.04±5.62		
Control	25	17.16±3.99		
Shopping hygiene			U=350.500	0.459
Cases	25	14.04±5.62		
Control	25	15.64±6.47		
Hand hygiene			U=363.000	0.321
Cases	25	19.40±5.08		
Control	25	21.04±4.01		
Hygiene when coming home from outside			U=319.000	0.899
Cases	25	10.44±3.41		
Control	25	10.68±3.33		
COVID-19 hygiene scale			U=334.000	0.676
Cases	25	101.00±20.24		
Control	25	103.68±19.83		

*p<0.05, U =Mann-Whitney U

Social Distance and Mask Wear sub-dimension mean scores of HD patients in the control group were 17.16±3.99; while the mean score of the Social Distance and Mask Wear sub-dimension of the HD patients in the case group was found to be 17.04±5.62, and there was no statistically meaningful difference between the two groups. Also, Social Distance and Mask Use sub-dimension mean scores of HD patients in the control and case groups were almost equal to each other. While the mean Shopping Hygiene sub-dimension score of HD patients in the case group was 14.04±5.62; the same mean score in the control group was found to be 15.64±6.47, and the difference between the two groups was not statistically meaningful. However, the Shopping Hygiene sub-dimension mean scores of HD patients in the control group were found to be higher. While the mean score of the Hand Hygiene sub-dimension of the HD patients in the case group was 19.40±5.08; the same in the control group was not found to be 21.04±4.01 and the difference between the two groups was not statistically meaningful. However, the Hand Hygiene sub-dimension mean scores of HD patients in the control group were observed to be higher.

The mean scores for the same in the control group were 10.68±3.33; while the mean score of the Hygiene When Coming Home from Outside sub-dimension of the HD

patients in the case group was determined as 10.44 ± 3.41 , and there was no statistically meaningful difference between the two groups. However, the mean scores of the Hygiene sub-dimension of the HD patients in the control and case groups were found to be almost equal to each other. The mean CHS score of the HD patients in the case group was 101.00 ± 20.24 ; while the same for those in the control group was 103.68 ± 19.83 , and the difference between the two groups was not statistically meaningful. However, the mean CHS scale scores of the HD patients in the control group were found to be higher (Table 2, Figure 2).

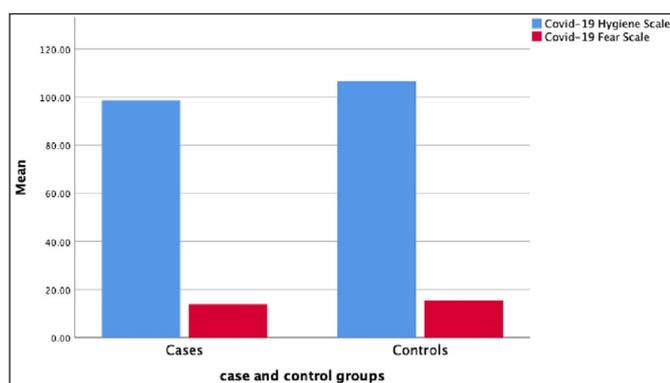


Figure 2. Comparison of the COVID 19 fear scale and COVID-19 hygiene scale total mean score of hemodialysis patients in the case and control groups

DISCUSSION

People undergoing HD feel the unfavorable impacts of the COVID-19 process at a higher grade. The infection risk of this patient group is high and they are in the chronic patient's category. In addition to advanced age and the presence of comorbidities, the immune system is significantly weakened in patients who experience COVID-19 complications (21). It has been reported in the literature that, 20.3% of the mortalities sourced by SARS-CoV-1 are patients with more than one comorbidity (22). COVID-19 has been causing extremely important and frightening consequences around the world. High stress, weak immune system, and increased catabolism are the factors that give rise to COVID-19 to be riskier for patients receiving HD and the infection course can be mortal in these groups.

In the literature, it has been noted that total lymphocytes are depressed, the prothrombin time is prolonged and lactate dehydrogenase levels are increased due to COVID-19 (10). However, T and B cell dysfunctions are common in patients receiving HD (23, 24), and they may suffer from more advanced lymphopenia with COVID-19 infection (25). Nevertheless, pre-infectious lymphopenia and similarly elevated procalcitonin do not provide insight as a prognostic criterion in the COVID-19 diagnosis, which requires the use of advanced diagnostic methods (radiographic findings, and viral nucleic acid testing) in COVID-19 infected HD patients (25).

The knowledge and awareness of individuals about undesirable impacts of COVID-19 are augmenting daily, due to the increased effect of both social media and mass. Therefore, HD patients are as well conscious of that, vulnerability of COVID-19 can be mortal which can arouse fear in individuals. Experiencing high levels of stress and fear is an undesirable experience which suggests the possibility of death (26). As a matter of fact, COVID-19 fear level of control group with COVID-19 was higher than the patients in case group ($p < 0.05$) in our study. It was emphasized that the risk of transmission arouses high fear due to the knowledge of the harmful impacts of COVID-19 in a study carried by Souse and coworkers with the participation of dialysis patients (27). Besides to this situation, the fact that patients receiving HD are generally older and have more than one such chronic diseases and comorbidities as hypertension (HT), diabetes mellitus (DM) and cardiovascular diseases (CVD) increase mortality (28).

In our study, the control and case groups had similar characteristics in terms of DM, cardiovascular diseases, HT and other comorbid diseases. COVID-19 has a mortality rate of 4.6% worldwide (29), and it has so far been determined that 10.5% of these mortalities are owing to CVD (30). However; DM was the frequent comorbidity in patients with middle east respiratory syndrome (MERS) and SARS-CoV-1 previous to COVID-19. In SARS, the prevalence of DM was 11%, and the existence of DM was hypothesized to increase the risk of death 12-fold (31,32). HT and DM were found in 50% of MERS cases (33). It has also been determined that the risk of CVD development due to COVID-19 is high in patients with DM and HT, and deaths occur in more than 50% of these patients (34-36). In a prior study, it was reported that 5.7% of mild cases and 16% of severe COVID-19 cases are DM ones (11).

Compared to the normal population, the mortality rate among dialysis patients is 6.5-7.9 times higher (37). Also, infectious diseases were found to be the most prevalent reason of mortality in 240 patients with acute and CKD (38, 39). Good hygiene behaviors are a psychological response to minimize the risk of contracting COVID-19 (40). Practicing good hygiene behaviors makes the person psychologically feel better in order not to be exposed to the devastating effects of the pandemic. In other words, thanks to good hygiene behaviors, individuals' fear of contracting COVID-19 is alleviated. In our study, while the mean CHS score of the HD patients in the control group was 103.68 ± 19.83 , the mean CHS score of the HD patients in the case group was 101.00 ± 20.24 ($p > 0.05$). The mean CHS scale scores of the HD patients in the control group were defined to be higher. However, both groups had a good CHS score and in our study, a positive

correlation was found between good hygiene behaviors and fear of contracting COVID-19 in both groups. Therefore, as the fear of COVID-19 increases, hygiene behaviors also improve.

It has been reported in a study that fear of COVID-19 improves hygiene behaviors, but individuals with anxiety and depression remain weak in acquiring good hygiene behaviors because their self-perception is negatively affected (40). In our study, the high CHS scores of both groups may not give an insight into their psychological resilience since hygiene behaviors have social, moral, religious, and societal dimensions. Thus, wearing a mask during the pandemic process, using hand sanitizer at the entrances and exits of the HD unit under the supervision of healthcare professionals, and the distance between the dialysis stretchers have led HD patients to gain good hygiene behaviors.

Limitations

The article has several limitations. First of all, the study is single-centered and the number of patients is low. The number of patients we could reach was only this much. Secondly, only hemodialysis patients with and without COVID-19 were included in the study. Except for hemodialysis, other COVID-19 patients were not included in the study.

CONCLUSION

It is clear that the whole world is feeling the overwhelming effects of the pandemic, and in this process, the hygiene behaviors of individuals are affected by COVID-19 fear. It is possible to say that HD patients, a population with a high burden of disease and care, have a high risk for COVID-19. It is of big importance that this particular patient group is handled by health care professionals, encouraged, and provided with psychological and social support.

The findings obtained in our study confirm that the adverse effects of fear of COVID-19 in HD patients should not be ignored and that they are encountered at a high rate. The chronic long-term effects of COVID-19 are yet to be fully perceived. In addition, due to the pandemic, not all of the available evidence could be confirmed by advanced diagnostic methods due to financial problems and lack of workforce, which, therefore, calls for additional studies are needed. Clinicians should be aware of the hygiene behaviors of HD patients, deficiencies should be determined at an early stage, and patients should be supported and educated.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was initiated with the approval of the Batman University Ethics Committee (Date: 09.04.2021, Decision No: 2021/01-12).

Informed Consent: Verbal consent was obtained from all patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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