

Evaluation of the relationship between COVID-19 anxiety and treatment compliance in hemodialysis patients: A prospective, descriptive study

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Abstract

Introduction: It is aimed in this study to evaluate the relationship between COVID-19 anxiety and treatment compliance in hemodialysis patients.

Methods: This study was conducted descriptively with 128 hemodialysis patients treated in the hemodialysis unit of a district state hospital between September and December 2021.

Results: It was observed that there was a significant relationship between the dialysis duration as well as the variable of forgetting to take their medicines while traveling and the coronavirus anxiety scores according to the multiple regression analysis regarding the variables affecting the coronavirus anxiety levels of the participants, and that these two variables were 25% determinant in the mean score of the coronavirus anxiety ($R^2 = 0.25$, $p = 0.00$).

Conclusion: It was found, as a conclusion, that the majority of the patients were compliant to the treatment and such variables as gender, education, profession, and dialysis duration were related to the coronavirus anxiety.

KEYWORDS

anxiety, COVID-19, hemodialysis, nursing, treatment compliance

1 | INTRODUCTION

The ongoing COVID-19 pandemic poses a global health threat [1]. The pandemic has been threatening the physical and mental health of individuals, thereby affecting many people around the world [2]. Furthermore, it remains uncertain when and how this devastating epidemic will come to an end. This uncertainty renders people more anxious and vulnerable [3]. It has been reported that the most intensely affected and most vulnerable groups in this pandemic are individuals with comorbid conditions such as diabetes, kidney failure, and cardiovascular diseases [4, 5]. People with chronic health problems constitute a great challenge to all healthcare facilities [6, 7].

Hemodialysis patients receive dialysis treatment two or three times a week. Situations such as close contact of patients in dialysis centers with healthcare personnel several times during hemodialysis sessions, use of public transport or centers' vehicles, contact with other patients and their caregivers in the waiting areas before and after sessions increase the risk even further [8, 9]. During such processes, the existing level of anxiety of these individuals may rise even more. In studies on the determination of anxiety levels in hemodialysis patients in the literature, it has been reported that the prevalence of anxiety and these anxiety levels may increase during the pandemic period [10–13]. This situation has been reported to have the possibility of impairing the self-management of patients or causing possibly deteriorating conditions [14]. In addition,

patient treatment compliance is an important indicator for the successful management of chronic diseases [15].

There are a number of factors that may affect patient compliance. Age, sociocultural status, pandemic process, and consequent anxiety can be specified among these factors [16–19]. Therefore, it is important for healthcare professionals to evaluate the anxieties of the patients relating to the pandemic process while evaluating the treatment compliance for the purpose of providing these patients with appropriate care, and in the light of such evaluations, a better direction of the practices for the training and care of patients can be enabled. Despite the presence of similar studies in the literature on the evaluation of the relationship between COVID-19 anxiety and treatment compliance in hemodialysis patients, it was aimed to evaluate the relationship between COVID-19 anxiety and treatment compliance in hemodialysis patients due to the absence of such a study in Turkey.

2 | MATERIALS AND METHODS

2.1 | Study design and sample

This study was conducted descriptively. The study was conducted between September 15, 2021 and December 15, 2021. The population of the study consisted of 147 dialysis patients receiving hemodialysis treatment in the hemodialysis unit of a state hospital. There was no sampling process in the study and all dialysis patients who met the inclusion criteria and agreed to participate in the study were included. 87% of the population (128 dialysis patients) was reached. According to the inclusion criteria, the study consisted of all hemodialysis patients who had been receiving hemodialysis treatment for at least 1 year, agreed to participate in the study, and had no communication barrier. The study data were collected based on the self-reports of the participants. The data were collected with face-to-face interviews by the researchers following the rules of social distance and mask. The patients who did not want to participate in the study, did not answer all the questions during the interview, filled in the forms incompletely, and gave up participating in the study were excluded from the study.

2.2 | Instruments

2.2.1 | Personal information form

This form was created by the researchers by reviewing the literature [4, 18–20]. The form content consisted of questions about the participants' age, gender, marital status,

educational status, profession, years of dialysis treatment, and the presence of other concurrent chronic diseases.

2.2.2 | Treatment compliance form

This form was created by the researchers by reviewing the literature [7, 20–22]. The form content consisted of questions about the participants' statuses of timely use of medications, forgetting to take medicines, discontinuing taking medicines upon feeling well, and forgetting to take medicines when they travel. Expert opinion was obtained from three nursing faculty members regarding the appropriateness of the questions.

2.2.3 | Coronavirus Anxiety Scale

The Turkish adaptation, validity, and reliability of the Coronavirus Anxiety Scale developed by Lee [23] were performed by Bicer et al. [24]. The scale was developed to determine the coronavirus-related anxiety of individuals. The scale has a single-factor structure and consists of five Likert-type items (“0” never, “4” almost every day in the last 2 weeks). One can take a score between 0 and 20 from the scale. A score of 9 and above is interpreted as high-level anxiety. The Cronbach's alpha value was 0.83 in the Turkish validity and reliability study of the scale [24]. In this study, the Cronbach Alpha value of the scale was 0.98.

2.3 | Statistical analysis

The statistical analysis was conducted with the package program SPSS 21. Among the highlighted characteristics, the descriptive statistics were expressed as mean \pm standard deviation for continuous variables, while they were expressed as numbers and percentages for categorical variables. Independent samples *t*-test and one-way variance analysis were used to compare descriptive characteristics and COVID-19 anxiety. Multiple linear regression analysis was used to determine the relationship between descriptive characteristics as well as treatment compliance and COVID-19 anxiety. Furthermore, Cronbach's alpha value was checked for the measurement reliability of the scale.

2.4 | Ethics statement

In order to conduct this study, approval from the ethics committee from the Non-Interventional Clinical Research Ethics Committee of a university (07.04.2021,

TABLE 1 Descriptive characteristics of the participants (n = 128)

Variables	$\bar{X} \pm SD$	
Age	61.0 \pm 8.70	
Dialysis time	6.9 \pm 3.63	
	N	%
Gender		
Female	45	35.2
Male	83	64.8
Education status		
Primary school	98	76.5
Secondary school	15	11.7
High school	11	8.5
University and more	4	3.3
Occupation		
Retired	80	62.5
Housewife	38	29.6
Employee	8	6.3
Officer	2	1.6
Comorbid chronic disease		
Yes ^a	80	62.5
No	48	37.5

^aDiabetes (56%–43.7%), hypertension (44%–34.3%), heart failure (14%–10.9%), liver disease (6%–4.6%).

GO 2021/138) and approval from the Ministry of Health were obtained before initiating the study. Written and verbal consents were also obtained from the dialysis patients who agreed to participate in the study. Our study was carried out in accordance with the principles of the Declaration of Helsinki.

3 | RESULTS

Descriptive statistics regarding the variables in the study, Cronbach's alpha value of the Coronavirus Anxiety Scale, and the relationship between the variables and the scale were examined. The descriptive analysis results of the descriptive characteristics and treatment compliance are presented in Tables 1 and 2.

Upon the examination of the distribution of hemodialysis patients with respect to their personal characteristics, it was seen that the mean age was 61.0 \pm 8.70 years, dialysis duration was 6.9 \pm 3.63 years, 64.8% of these patients were males, 76.5% were primary school graduates, 62.5% were retired, and 62.5% had comorbid chronic disease (Table 1).

TABLE 2 Treatment compliance of the participants (n = 128)

Variables	N	%
Do you take your medicines on time?		
Anytime	98	76.5
Sometimes	14	10.9
Rarely	12	9.3
Never	4	3.3
Do you ever forget to take your medicine?		
Anytime	4	3.3
Sometimes	18	14.0
Rarely	24	18.7
Never	82	64.0
Do you ever stop taking your medicine when you feel better?		
Anytime	2	1.6
Sometimes	10	7.8
Rarely	24	18.8
Never	92	71.8
Do you forget to take your medicines with you when you travel?		
Anytime	2	1.6
Sometimes	18	14.0
Rarely	22	17.3
Never	86	67.1

Considering the answers of the individuals participating in the study to the questions about their treatment compliance, it was seen that 76.5% of the participants always took their medicines on time, 64% never forgot to take their medicines, 71.8% did not discontinue taking their medicines even when they felt good, 67.1% never forgot to take their medicines when they traveled (Table 2).

The mean score of the patients on the Coronavirus Anxiety Scale was determined as 3.27 \pm 4.44. When Table 3 was examined, while the relationship between coronavirus anxiety level and gender ($p = 0.004$), educational status ($p = 0.001$), occupation ($p = 0.002$), and dialysis duration ($p = 0.000$) was found to be statistically significant, no statistically significant relationship was found between age and status of having comorbid chronic disease ($p > 0.05$). Upon the examination of the bilateral compatibility status in terms of education level, a significant difference was seen between the patients with university and higher education degrees and other groups, and the fear of coronavirus among the patients with university or higher education degrees was significantly higher than the others. This difference is considered to be caused by the very limited number of

TABLE 3 Results of comparison of descriptive features with Coronavirus Anxiety Scale^a mean score

Variables	Coronavirus Anxiety Scale	
Age		
<50 years	3.7 ± 4.55	$F = 1.31$
50–60 years	3.5 ± 4.72	$p = 0.326$
>60	2.2 ± 3.76	
Gender		
Female	5.2 ± 5.23	$t = 3.03$
Male	2.4 ± 3.78	$p = 0.004$
Education status		
Secondary school	3.5 ± 4.55 ^a	$F = 5.89$
High school	1.1 ± 1.95 ^a	$p = 0.001$
University and more	0.8 ± 1.68 ^a	
Secondary school	10.0 ± 4.61 ^b	
Occupation		
Housewife	5.5 ± 5.22 ^a	$F = 5.20$
Employer	3.2 ± 3.49	$p = 0.002$
Retired	2.3 ± 3.82 ^b	
Dialysis time		
<5 years	1.8 ± 3.36 ^a	$F = 12.36$
5–10 years	4.7 ± 4.98 ^b	$p = 0.000$
>10 years	4.2 ± 4.23 ^c	
Comorbid chronic disease		
Yes	3.2 ± 4.51	$t = -0.12$
No	3.3 ± 4.3	$p = 0.903$

Note: Bold values indicates the significance differences.

university or higher education graduates within the sample. On occupation comparison, a significant relationship was only seen between housewives and retirees, and housewives were seen to have a higher level of coronavirus-related fear. On evaluation based on the duration of diagnosis, it was found that the relationship between the patients with a diagnosis duration of fewer than 5 years and the other groups was significant, while there was no significant relationship between the patients with a diagnosis duration between 5 and 10 years and the patients receiving dialysis for more than 10 years (Table 3).

Multiple regression analysis of the variables affecting the coronavirus anxiety levels of the participants is given in Table 4. It was seen accordingly that there was a significant relationship between the dialysis duration as well as the variable of forgetting to take their medicines while traveling and the coronavirus anxiety scores, and that these two variables were 25% determinant in the mean score of the coronavirus anxiety ($R^2 = 0.25$, $p = 0.00$) (Table 4).

TABLE 4 Regression analysis of the coronavirus anxiety scale with descriptive features and adherence to treatment in hemodialysis patients (n = 128)

	Coronavirus Anxiety Scale			
	<i>R</i>	Adjusted <i>R</i> ²	<i>F</i>	<i>p</i>
	0.55	0.25	5.12	0.00**
	<i>B</i>	β	<i>t</i>	<i>p</i>
Age	−0.02	−0.04	−0.40	0.69
Gender ^a	−2.09	−0.22	−1.57	0.12
Education status ^b	0.51	0.05	0.58	0.56
Occupation ^c	0.50	0.06	0.38	0.70
Comorbid chronic disease ^d	−0.82	−0.09	−1.02	0.31
Dialysis time ^e	−1.84	−0.21	−2.24	0.03*
Taking medications on time ^f	−1.81	−0.09	−1.09	0.28
Forgetting to take medications ^g	0.14	0.02	0.09	0.93
Stopping the drugs when you feel better ^g	0.55	0.06	0.52	0.60
Forgetting to take medicines with you when traveling ^g	−3.63	−0.40	−2.20	0.03*

^aMale.

^bPrimary school.

^cRetired.

^dYes.

^e<5 year.

^fAlways.

^gNever.

* $p < 0.05$. ** $p < 0.01$.

4 | DISCUSSION

In this study, the relationship between COVID-19 anxiety and treatment compliance of the patients receiving hemodialysis treatment was studied. It was observed in the study that the majority of the participants always took their medicines on time, never forgot to take their medicines, did not discontinue taking their medicines even when they felt good, and never forgot to take their medicines when they traveled. These results are consistent with the literature. Upon the examination of the studies on the subject, it was reported, as similar to our study, that patients did not forget to take their medicines and used the medicines regularly [7, 20, 22]. This can be attributed to the severity of the disease, disease requirement for a strict follow-up, and the higher risk of the group due to the pandemic. In addition, the success in the treatment of

individuals with chronic diseases was largely related to treatment compliance [21].

Upon the comparison of the mean score of the Coronavirus Anxiety Scale and the descriptive characteristics of the patients, gender, education level, occupation, and dialysis duration were found to be associated with the coronavirus anxiety. While the anxiety levels of the female patients, university and higher education graduates, and housewives were higher, the anxiety levels of the patients with dialysis durations of <5 years were found to be lower. When similar studies were examined, various sociodemographic characteristics (gender, marital status, education) were observed to affect the level of anxiety during the pandemic process [16–18]. The high level of anxiety of the women and housewife patients in our study can be attributed to the traditional roles attributed to these individuals in Turkey, such as home and child care, and the fact that patients could spare less time for self-care and take more responsibility with the burden of such roles. The high level of anxiety of the university- and higher education graduates may result from the low number of patients in the sample, and it can also be attributed to the fact that these individuals' higher socio-cultural levels might lead them to be more aware of the risks that may arise with a COVID-19 diagnosis. The high level of anxiety of the patients with dialysis durations of more than 5 years may be due to the possibility of the depletion of coping power with the extension of the duration of the disease and treatment, and due to the thought that a COVID-19 diagnosis may bring additional risk and burden for them.

According to the regression analysis conducted in the study, the descriptive characteristics and treatment compliance were 25% determinant of coronavirus anxiety. Accordingly, it can be concluded that those with better treatment compliances have a lower level of anxiety. Similar results have been reported in the subject-based literature examination as well [22, 25]. In light of all these results, healthcare professionals should consider the anxieties of the patients about the pandemic process while evaluating patients' compliance with treatment and also support patients during their treatment as well as training and care regarding the COVID-19 pandemic and preventing from the same. In addition, considering that nurses are most frequently contacted healthcare professionals during hemodialysis, the practices aimed at reducing anxiety and enhancing treatment compliance may be considered while providing care for these people.

Since the study was conducted in a single center and a district hospital, the study results may have limited generalizability. Furthermore, our universe was small due to the small area of the study region, which caused the study to be conducted with a small number of samples. This is regarded as another limitation of the study.

5 | CONCLUSION

It was found, as a conclusion, that the majority of the patients were compliant to the treatment and such variables as gender, education, occupation, and dialysis duration were related to the coronavirus anxiety. It was also observed that the descriptive characteristics of the patients and treatment compliance were associated with coronavirus anxiety. To increase the generalizability of the study, it can be recommended to conduct another study with a larger sample group. On the other hand, considering that nurses are the most frequently communicated, mostly consulted, and most easily reached healthcare professionals regarding the problems during this pandemic process, it can be suggested that they incorporate more training and practices in their care for treatment compliance and for reducing patient anxiety during the pandemic process. It must follow periodic monitoring of compliance and fear levels of hemodialysis patients, especially during the Covid-19 process, and the presence of a different disease other than renal failure. In addition, it is recommended planning of the individual's care to include all problems, training of nurses who care for patients undergoing hemodialysis about the fear of Covid-19, and contributing to nursing practices in the light of this information.

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CONFLICT OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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REFERENCES

1. Legido-Quigley H, Asgari N, Teo YY, Leung GM, Oshitani H, Fukuda K, et al. Are high-performing health systems resilient against the COVID-19 epidemic? *Lancet*. 2020;395(10227):848–50.
2. Colbourn T. COVID-19: extending or relaxing distancing control measures. *Lancet Public Health*. 2020;5(5):e236–7.
3. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *Lancet*. 2020;395(10223):470–3.
4. Monahan C, Macdonald J, Lytle A, Apriceno M, Levy SR. COVID-19 and ageism: how positive and negative responses impact older adults and society. *Am Psychol*. 2020;75(7):887–96.

5. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China. *JAMA*. 2020;323(13):1239–42.
6. Naeem Z. Burden of diabetes mellitus in Saudi Arabia. *Int J Health Sci*. 2015;9(3):V–VI.
7. Zakaria OM, Albshr FA, Aljarrash KM, Alkhalaf GI, Alsheef NJ, Daoud MYI. Does COVID-19 pandemic affect medication compliance among chronic patients. *Sapporo Med J*. 2020;54(7):458.
8. Rincón A, Moreso F, López-Herradón A, Fernández-Robres MA, Cidraque I, Nin J, et al. The keys to control a COVID-19 outbreak in a haemodialysis unit. *Clin Kidney J*. 2020;13:542–9.
9. Oruc A, Aktas N, Dogan I, Akgur S, Ocakoglu G, Ersoy A. The perspectives of dialysis patients about the Covid-19 pandemic and differences between the modalities. *Ther Apher Dial*. 2022;26(1):178–84.
10. Kurtgoz PO, Sackan F, Kızırlanoglu MC, Bilgin O, Guney I. Effect of anxiety on COVID-19 infection in hemodialysis patients. *Ther Apher Dial*. 2021;25(4):1–6.
11. Huang CW, Wee PH, Low LL, Koong YLA, Htay H, Fan Q, et al. Prevalence and risk factors for elevated anxiety symptoms and anxiety disorders in chronic kidney disease: a systematic review and meta-analysis. *Gen Hosp Psychiatry*. 2021;69:27–40.
12. Al-Shammari N, Al-Modahka A, Al-Ansari E, Al-Kandari M, Ibrahim KA, Al-Sanea J, et al. Prevalence of depression, anxiety, and their associations among end-stage renal disease patients on maintenance hemodialysis: a multi-center population-based study. *Psychol Health Med*. 2021;26(9):1134–42.
13. Mosleh H, Alenezi M, Alsani A, Fairaq G, Bedaiwi R. Prevalence and factors of anxiety and depression in chronic kidney disease patients undergoing hemodialysis: a cross-sectional single-center study in Saudi Arabia. *Cureus*. 2020;12(1):e6668.
14. Li H, Jiang Y, Lin CC. Factors associated with self-management by people undergoing hemodialysis: a descriptive study. *Int J Nurs Stud*. 2014;51(2):208–16.
15. Rafi F, Fatemi NS, Danielson E, Johansson CM, Modanloo M. Compliance to treatment in patients with chronic illness: a concept exploration. *Iran J Nurs Midwifery Res*. 2014;19(2):159–67.
16. Avçın E, Erkoç B. Health anxiety, life satisfaction and related variables during the COVID-19 pandemic. *J Med Soc Work*. 2021;17:1–13.
17. Ekiz T, Ilman E, Dönmez E. Comparison of individuals' health anxiety levels with the perception of control of the Covid-19 epidemic. *Int J Health Manag Strat Res*. 2020;6(1):139–54.
18. Erdoğan Y, Koçoğlu F, Sevim C. Investigation of anxiety and hopelessness levels according to psychosocial and demographic variables during the COVID-19 pandemic. *J Clin Psychiatry*. 2020;23:1–14.
19. Hao W, Tang Q, Huang X, Ao L, Wang J, Xie D. Analysis of the prevalence and influencing factors of depression and anxiety among maintenance dialysis patients during the COVID-19 pandemic. *Int Urol Nephrol*. 2021;53(7):1453–61.
20. Özkurt S, Sağlan Y, Gölgeci H, Balcioglu H, Sağlan R, Bilge U, et al. Evaluation of adherence to treatment in hemodialysis patients. *Ankara Med J*. 2017;17(4):275–83.
21. Naqvi AA, Hassali MA, Aftab MT, Nadir MN. A qualitative study investigating perceived barriers to medication adherence in chronic illness patients of Karachi, Pakistan. *J Pak Med Assoc*. 2019;69:216.
22. Yılmaz FT, Sert H, Kumsar AK, Aygin D, Sipahi S, Genç AB. Evaluation of hope levels, symptom control and treatment compliance of patients receiving hemodialysis treatment. *Acibadem Univ J Health Sci*. 2020;1:35–43.
23. Lee SA, Mathis AA, Jobe MC, Pappalardo EA. Clinically significant fear and anxiety of COVID-19: a psychometric examination of the Coronavirus Anxiety Scale. *Psychiatry Res*. 2020;290(113112):1–7.
24. Bicer İ, Çakmak C, Demir H, Kurt ME. Short form of the Coronavirus Anxiety Scale: Turkish validity and reliability study. *Anadolu Clin J Med Sci*. 2020;25(Supplement 1):216–25.
25. Topbaş E, Bingöl G. Nursing interventions for dialysis treatment and adjustment process with its psychosocial dimension. *J Nephrol Nurs*. 2017;12(1):36–42.

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