

Original Article

Hopelessness, Anxiety, Depression and Treatment Adherence in Chronic Hemodialysis Patients

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Abstract

Background: Noncompliance with hemodialysis (HD) increases hospitalization and mortality risks. Depression and anxiety are common for HD patients. It was found that the negative effects of anxiety and depression on adherence to treatment. However, none of these studies analyzed the relationship between hopelessness on treatment adherence.

Objective: This cross-sectional descriptive study aims to evaluate the patients' adherence to HD treatment by using objective and subjective data and to determine the relationship between anxiety, depression, hopelessness, sociodemographic factors and treatment adherence.

Methodology: The study was conducted in February 2018 Istanbul, Turkey. All the patients that received HD treatment (N=170) at the HD center constituted the universe of the study. 90 out of 170 patients that agreed to participate in the study and that met the inclusion criteria constituted the sample of the study. The data were collected using a patient information form, End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ), Hospital Anxiety and Depression Scale (HADS), Beck's Hopelessness Scale (BHS) and medical records of the patients. The descriptive statistics, Mann-Whitney U, Spearman correlation and Regression coefficients tests were used for analyzing data.

Results: The participants had an average age of 53.7 ± 12.69 (19-81), 54.4% of the participants were female, HD period of the patients was 63.51 ± 49.39 (6-192) months on average. Especially in hopelessness, there were a significant relationship between the levels of anxiety, depression, and the adherence parameters.

Conclusions: Further studies on HD patients may evaluate not only depression but also hopelessness levels of the patients. Future studies to increase treatment adherence may consider the efficiency of practices to decrease hopelessness and analyze the effects of these practices on treatment adherence.

Key Words: Adherence to treatment; Hopelessness; Consultation Liasion Nursing; Hemodialysis.

Introduction

Today, more than two millions of people around the world survive with dialysis or transplantation due to End-Stage Renal Disease (ESRD). However, it is estimated that this number reflects only 10% of the actual patients that need medical treatment in order to survive (Couser, Remuzzi & Mendis, 2011).

Hemodialysis (HD) is the main treatment method for ESRD (Suleymanlar, Ateş ve Seyahi, 2015). Generally, HD takes four hours and ESRD patients receive HD three times a week. Stress factors of HD treatment include diet limitation, long periods of dialysis sessions, dependence on

dialysis machine and health professionals, indefinite period for renal transplantation, functional limitations, performance loss in work and roles, changes in sexual life, side effects of treatment and fear of death (Kimmel, 2002).

Some adaptation problems also arise as a side effect of HD treatment. The patient and his/her close relatives have to make fundamental changes in their daily life. Success of HD depends on adherence to fluid limits, prescribed diet and medication and attendance to hemodialysis for the prescribed period (Russel, Knoeles & Peace, 2011). It has been noted that at

least 50% of the ESRD patients do not adhere to HD (Kutner, 2001).

Treatment adherence is the key for the success of all treatment methods. If the patient fails to adhere to treatment, optimal benefits of the treatment decreases, which, in turn, diminish the general efficiency of health services (WHO, 2003). Treatment adherence is the process during which the patient agrees on treatment procedures and applies them. Starting a treatment process and successfully finishing it, attending check-ups, using medications at suggested rates for suggested period, changing life style and managing the disease are critical elements of treatment adherence (Velligan, Weiden & Sajatovic, 2010).

Characteristics of the disease and the treatment process play an important role in the process of adaptation to a chronic disease. Invasive treatment methods such as HD, side effects of treatment, dependence on dialysis machine and health professional, and the requirement to adhere to prescribed diet and fluid limits have fundamental effects on life styles and health status of the ESRD patients (Baines, Zawada & Jindal, 2005). ESRD patients continuously remember their disease since they spend long hours that cannot be delayed, and have to adhere to fluid limits, diet and medications. Chronic HD patients and their close relatives have to change their life style in order to adapt to the requirements of the treatment process (Denhaerynck, Manhaeve & Dobbels, 2007). Noncompliance with HD increase hospitalization and mortality risks (Denhaerynck et al., 2007). Various studies noted that mortality risk increases 13% to 30% if the patient does not receive HD treatment regularly, 11% to 24% if treatment period is shortened, and 12% if the patient does not adhere to fluid limits. Besides, hypophosphatemia and hyperpotasemia increases mortality risks by 17% and 9%, respectively (Leggat, 2005). Factors that influence adherence to HD treatment include sociodemographic and psychosocial factors related with the patient. Besides, characteristics of patients, their life styles, treatment process or health personnel may have an impact on adherence to HD treatment (Rosner, 2006). Other factors that influence HD treatment process are forgetfulness, psychological stress, inadequate knowledge and skills in managing the disease symptoms and treatment, lack of self-perceived need for treatment, non-acceptance of the

disease, and negative beliefs regarding the efficiency of treatment (WHO, 2003).

Among these factors, psychiatric disorders, such as depression and anxiety are common for the HD patients. Existing studies reveal that anxiety and depression are related with decreases in life quality, treatment adherence and lifetime of the HD patients (DiMatteo, Lepper & Croghan, 2000; Chen, Tsai & Hsu, 2010; Cukor, Halen & Asher, 2014). Besides, patients with psychiatric disorders have lower life quality and poor adherence rates (Taskapan, Ates & Kaya, 2005). Leggat, (2005) found the positive impact of adherence to HD treatment on life quality and lifetimes of the patients. Besides, treatment adherence in HD patients decreases health service costs (Rosner, 2006).

This study aims to evaluate the patients' adherence to HD treatment by using objective and subjective data and to determine the relationship between anxiety, depression, hopelessness, sociodemographic factors and treatment adherence.

Methods

This cross-sectional descriptive study was designed in order to determine the relationship between treatment adherence and the levels of anxiety, depression and hopelessness for the patients that receive HD. The study was conducted in February 2018 at a private hemodialysis center located in Istanbul, Turkey. 170 patients that received HD treatment at the hemodialysis center constituted the universe of the study. The patients above 18, who agreed to participate, and who met the following inclusion criteria were included as participants:

- Diagnosed with ESRD
- Received HD treatment for at least three months, three times a week and three-to-four hours during each HD session.
- Were not hospitalized but came to the dialysis center from home
- Were not diagnosed with psychiatric disorders according to the DSM V TR or ICD-10.
- Could maintain self-care independently
- 90 out of 170 patients that agreed to participate in the study and that met the inclusion criteria constituted the sample of the study.

Research Tools for Gathering Data

Patient Information Form: This form was used to collection formation on sociodemographic characteristics of the patients, such as age,

education, income, gender, as well as information on treatment process, including, treatment method, duration of disease, chronic illnesses, which may all effect treatment adherence.

End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ): ESRD-AQ was developed by Kim, Evangelista, Phillips et al., (2010). Reliability and validity of the Turkish version of the ESRD-AQ was evaluated by Ok (2017). ESRD-AQ consists of four subscales, namely adherence to treatment (items 1, 3, and 5), medications (6th item), fluid restrictions (8th item) and diet recommendations (9th item). Possible scores to be obtained from the scale range between zero and 1200. Higher scores received from the ESRD-AQ indicate better compliance with treatment. Kim et al. (2010), internal consistency reliability (Cronbach's α) was omitted since the instrument's design does not possess homogeneous items to address internal consistency reliability. The item-total scale correlation coefficients were 0.48 to 0.80 (Ok, 2017). In the current study, the item-total scale correlation coefficients were 0.38 to 0.81.

Hospital Anxiety and Depression Scale (HADS): HADS is a self-evaluation scale developed by Zigmond and Snaith (1983) in order to determine the risks, levels and severity of anxiety and depression for the patients with physical diseases. Reliability and validity of the Turkish version of the HADS was evaluated by Aydemir et al. (1997). The scale consists of two subscales, namely anxiety (HAD-A) and depression (HAD-D). Cronbach's alpha values for the Turkish version of the HAD-A and HAD-D were 0, 85 and 0, 77, respectively.

HADS consists of 14 items. Seven items that start with odd numbers measure anxiety, whereas the remaining items that start with even numbers measure depression. Turkish version of the HADS uses four-point Likert scale. Cutoff score is 10/11 for the anxiety subscale and 7/8 for the depression subscale. Patients that score above the cut off score are considered to be at risk groups. Scores to be received from each of the two subscales range between zero and 21 (Aydemir and Koroglu, 2006).

Beck's Hopelessness Scale (BHS): BHS, which was developed by Beck et al. (1974) aims to measure the expectations of the participants regarding the future and their levels of hopelessness. Two different studies were conducted by Seber (1991) and Durak (1993) in

order to evaluate reliability and validity of the Turkish version of the BHS. Cronbach's alpha value for the study of Seber (1991) was 0, 86, whereas Durak (1993) found the Cronbach's alpha value of 0, 85 (Aydemir and Koroglu, 2006).

BHS consists of 20 items. Each item asks the patient to evaluate whether the statement is true or false. If the answer of the participant is *true* for eleven items (Items 2, 4, 7, 9,11, 12, 14,16, 17, 18, and 20) and *false* for the remaining nine items (Items 1, 2, 5, 6, 8, 10, 13, 15 and 19), the participant receive a score of 1; otherwise the participant does not receive any score. Total scores indicate the level of hopelessness. Total score may range between 0 and 20, and higher scores indicate higher levels of hopelessness (Aydemir and Koroglu, 2006).

Medical records of the patients: We also recorded medical records of the patients between two consecutive HD sessions. Data recorded included interdialytic weight gain (IDWG/day), Kt/V, albumin (Alb), serum potassium (K), and phosphate (PO₄). K, P, Alb Kt/V values have been regularly measured by using blood drawn before dialysis whereas IDWG is measured before each HD sessions. Recommended adaptation parameters for HD treatment are IDWG<1000g/Day, serum K \leq 5.5 mmol/L, PO₄ \leq 5.5 mg/dL, Alb \geq 4g/L and Kt/V \geq 1.2 (National Kidney Foundation, 2006). This study took the average values for serum K, PO₄, and Alb measured in the last month, and the average IDWG measured in the last two weeks prior to the research. Since Kt/V was higher than 1.2 for all patients, it was not considered within the scope of this research.

Data Analysis: Data collected was analyzed by using licensed SPSS 21 statistical package program. We used descriptive statistics (percentage, mean, and standard deviation), Cronbach's alpha coefficient and non-parametric tests for correlation analysis (Mann-Whitney U, Spearman's correlation coefficient and Regression coefficients). $p < 0.05$ is taken as significance level.

Ethical Considerations: Written permission of Acıbadem Mehmet Ali Aydınlar University Medical Research Ethics Committee (11.01.2018-2018/1-10) and the Hemodialysis center was obtained prior to research. Besides, verbal and written consent of the participants was obtained.

Results

The participants had an average age of 53.7 ± 12.69 (19-81). 54.4% of the patients were female, 71.1% were graduates of primary school, 70.0% were married, 50% were retired and 50% of the participants expressed that they had sufficient income. HD period of the patients was 63.51 ± 49.39 (6-192) months on average, peritoneal dialysis story was 5% and

transplantation story was 8%. 10% of the participants expressed that they smoked less than one package of cigarette per day and 47.8% had chronic diseases other than ESRD. In addition, 11.1% of the patients had depression in 27.7% of anxiety according to HADS. The average scores of the scales and treatment adherence values are in table 1.

Table 1: Mean, standard deviation and Cronbach's alpha values

Variables	Mean (SD)	Range	Cronbach's α
ESRD-AQ	985 (145.61)	450-1200	-
HADS/A	4.72 (4.06)	0-18	0.822
HADS/D	5.71 (3.91)	0-17	0.836
BHS	7.61 (4.6)	0-18	0.831
IDWG/Day	1417.17 (393.16)	100-3000	
PO ₄	5.04 (0.99)	2.80-6.90	
Alb	4.26 (0.33)	3.40-5.10	
K	5.15 (0.29)	4.30-5.80	

Table 2: Relationship between sociodemographic characteristics and adherence to treatment

Variables	ESRD-AQ	HADS/A	HADS/D	BHS	IDWG	PO ₄	Serum K	Alb
Age	0.313**	-0.199	-0.105	0.055	-0.125	-0.06	-0.065	-0.067
Duration of HD	0.064	0.037	-0.144	0.158	0.066	0.167	-0.042	-0.023
Education	0.018	-0.156	-0.214*	-0.200	0.004	0.118	-0.033	0.077
Income	-0.129	0.095	0.064	0.030	-0.045	0.096	0.060	-0.043
Chronic Disease	0.216*	0.017	0.076	0.170	-0.036	-0.076	0.087	-0.003

Spearman correlation coefficient. *p<0.05 **p<0.01

Table 3: Intercorrelations among key measures.

Variables	ESRD-AQ	HAD-A	HAD-D	BU	IDWG	PO ₄	Alb
HAD-A	-0.423**						
HAD-D	-0.392**	0.599**					
BU	-0.382**	0.523**	0.821**				
IDWG	-0.533**	0.351**	0.428**	0.434**			
PO ₄	-0.237*	0.238*	0.245*	0.364**	0.362**		
Alb	0.040	0.000	-0.195	-0.204	0.089	0.151	
K	-0.168	0.058	0.108	0.210*	0.068	-0.18	-0.15

Spearman correlation coefficient. *p<0.05 **p<0.01

Table 4: Regression coefficients for ESRD-AQ, IDWG and PO₄.

Dependent variable	Independent variable	Regression coefficient	St. regression coefficient β	t	p	R ²	F
ESRD-AQ	BHS	-11.682	-0.369	-3.727	0.001	0.136	13.891
IDWG	BHS	41.228	0.483	5.169	0.001	0.233	26.723
PO ₄	BHS	0.080	0.371	3.743	0.001	0.137	14.013
K	BHS	0.009	0.141	1.335	0.185	0.020	1.782

We first analyzed the relationship between sociodemographic characteristics of participants, their treatment adherence and the levels of anxiety, depression and hopelessness (Table 2). We found a positive and significant relationship between the average score for treatment adherence, age and number of chronic illnesses. Besides, we found a negative and significant relationship between education level and average depression scores. Furthermore, there was a significant difference between the average anxiety scores of female 5.75(4.22) and male 3.48(3.52) participants.

Secondly, we analyzed the relationship between the levels of anxiety, depression, and hopelessness and the adherence parameters (Table 3). We found a negative relationship between average ESRD-AQ scores and average anxiety, depression and hopelessness scores, IDWG and PO₄. Besides, the analysis indicates a positive relationship between average anxiety scores and the average depression, hopelessness scores, IDWG and PO₄ values. The relationship between average depression scores and average hopelessness scores, IDWG and PO₄ was positive and significant. In addition to IDWG and PO₄, we found a positive relationship K and average Hopelessness score. The relationship between IDWG and PO₄ was positive and significant.

Finally, we conducted multiple regression analysis in order to determine the effect of anxiety, depression and hopelessness on treatment adherence for the HD patients (Table 4). Since the relationship between depression and hopelessness was high and since hopelessness was related with treatment parameters with the exception of Alb, we considered anxiety and hopelessness as independent variables at the first stage of regression analysis. However, multiple linear regression analysis found that anxiety as

an independent variable had no meaningful impact on treatment adherence parameters. Due to this reason, we conducted simple linear regression analysis in order to determine the impact of hopelessness on treatment adherence parameters. The analysis revealed that hopelessness could explain 14% of the total variance in ESRD-AQ scores and PO₄ values and 23% of variance in IDWG values.

Discussion

This study aimed to determine the relationship between anxiety, depression and hopelessness levels of the HD patients, their sociodemographic characteristics and their adherence to HD treatment. We found that increase in age and the number of chronic diseases brought an increase in treatment adherence. Existing studies have also found similar findings in terms of the relationship between age and treatment adherence in HD patients (Saran, Bragg-Gresham & Rayner, 2003; Kugler, Vlaminck & Haverich, 2005; Mellon, Regan & Kurtis, 2013; Oquendo, Asencio & Nieves, 2017). The relationship between the number of chronic diseases and adherence to treatment may be explained with reference to the increase in chronic diseases parallel to aging ($r=0.370$; $p<0.01$). We also found that average depression scores decreased as education level increased and that average anxiety scores were higher for female participants compared to the male participants. These findings are consistent with the findings of Lopes, Bragg, Young et al. (2002).

This study analyzed the relationship between average anxiety, depression and hopelessness scores and parameters of adherence to treatment. We found that as average anxiety, depression and hopelessness scores increased, adherence to treatment scores decreased but average IDWG

and PO_4 values increased. Although there is no significant relationship between Alb values and any parameters, increase in average hopelessness scores brought an increase in K values.

Previous studies found the negative effects of anxiety and depression on adherence to treatment for the case of HD patients (DiMatteo et al., 2000; Lopes et al., 2002; Taskapan et al., 2005; Chen et al., 2010; Cukor et al., 2014). However, none of these studies analyzed the relationship between hopelessness on treatment adherence.

Our study did not find any positive effects of anxiety on treatment adherence. Unlike our study, the study of Mellon et al. (2013) found that anxiety had a positive impact on PO_4 values. They found that the increase in average anxiety scores was associated with a decrease in PO_4 values. In our study; anxiety, depression and hopelessness had a significant impact on the decrease in average ESRD-AQ scores and increase impact on IDWG and PO_4 values. Despite the close relationship between depression and hopelessness, the relationship between average depression scores and subjective treatment adherence scores obtained from ESRD-AQ as well as the relationship between hopelessness and objective parameters of treatment adherence was high. In this case, if symptoms of depression may be considered as the patient's call for help, hopelessness may be interpreted as if the patient stops his/her call. Due to this reason, increase in both the objective and subjective parameters of adherence to treatment may be seen in case of an increase in hopelessness.

The relationship between depression, hopelessness and suicide has been already noted (Holden, 2001). A limited number of studies have dealt with suicide rates among the HD patients. For example, the study of IM, PH, VC et al. (2018) on HD patients in Taiwan found that suicide rates for HD patients were 20 times higher than normal population between 2006 and 2012. Another study conducted by ACT, MC, FB et al. (2018) on 264 HD patients found that 17.8% of the patients were under the risk of suicide, 14% suffered from major depressive episode and 14.7% had anxiety disorder. Additionally, various studies revealed the relationship between noncompliance with treatment and mortality for HD patients. Consequently, noncompliance with treatment may end up with death over time. Given the

impact of hopelessness on noncompliance with treatment, we may conclude that further comprehensive studies on this subject may be conducted. Further studies on HD patients may evaluate not only depression but also hopelessness levels of the patients. It is thought that hopelessness consists of three parts; expectations about the future, loss of emotion and motivation for the future; studies to improve treatment compliance should focus on interventions specifically addressing these areas and assessing the impact on outcomes. In this context, applications such as motivational interviewing, hope therapy, self-efficacy and empowerment of self-esteem may be preferred. Such individual-specific practices are thought to be more effective than classical training practices in order to increase patient participation in the treatment process and to strengthen individual competence.

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