DOI: 10.5455/bcp.20110501043857

Temperament and Character Profiles of End Stage Renal Disease Patients Undergoing Hemodialysis and Peritoneal Dialysis

Fatma Ozlem Orhan[1], Ali Ozer[2], Hayriye Sayarlioglu[3], Ekrem Dogan[3], Ozlem Altunoren[4], Oguz Akman[1], Mehmet Fatih Karaaslan[1], Aysegul Temizkan[5]

ÖZET:

Hemodiyaliz ve periton diyalizine giren son dönem böbrek yetmezliği hastalarında mizaç ve karakter özellikleri

Çalışmanın amacı hemodiyaliz ve periton diyalizine giren son dönem böbrek yetmezliği hastalarında mizaç ve karakter özelliklerini araştırmak ve sağlıklı kontrollerle karşılaştırmaktır. Çalışmanın örneklemi 39 hemodiyaliz hastası (24 kadın, 15 erkek), 30 periton diyalizi hastası (16 kadın, 14 erkek) ve yaş, cinsiyet yönünden eşleşmiş 39 sağlıklı kontrolden (24 kadın, 15 erkek) oluşmaktadır. Tüm katılımcılar 240 soruluk mizaç ve karakter envanterini (MKE) ve hastane anksiyete depresyon ölçeğini doldurdu. Yenilik arayışı ve kendini yönetme puanları hastalarda anlamlı şekilde düşüktü. Hemodiyaliz ve periton diyalizi hastaları arasında depresyon ve anksiyete skorları yönünden fark yoktu. MKE puanları ve laboratuvar değişkenleri arasında anlamlı korelasyon saptanmadı. Bu alanda yapılacak çalışmalar, hemodiyaliz ve periton diyalizi hastalarının mizaç ve karakter özelliklerine özel müdahalelerinin geliştirilmesini sağlayacaktır. Son evre böbrek yetmezliği olan hastaların değerlendirme ve tedavisinde klinik pratikte psikosomatik yaklaşımların da dahil edilmesi gerektiğini düşünüyoruz.

Anahtar sözcükler: Hemodiyaliz, periton diyalizi, kişilik, mizaç ve karakter, depresyon, anksiyete

Klinik Psikofarmakoloji Bülteni 2011;21(3):201-9

ABSTRACT:

Temperament and character profiles of end stage renal disease patients undergoing hemodialysis and peritoneal dialysis

The aim of this study was to evaluate the temperament and character profiles of end stage renal disease patients (ESRD) undergoing hemodialysis and peritoneal dialysis and to compare the results with those of healthy controls. The study population consisted of 39 hemodialysis patients (24 female, 15 male), 30 peritoneal dialysis patients (16 female, 14 male), and 39 age and gender-matched healthy control subjects (24 female, 15 male). All participants were instructed to complete a self-administered 240-item temperament and character inventory (TCI) and the Hospital Anxiety and Depression Scale (HADS). Novelty Seeking and Self-Directedness scores were significantly lower in patients. There was no difference between hemodialysis and peritoneal dialysis patients regarding depression and anxiety scores. There were no significant correlations between TCI scores and laboratory variables. Studies in this area may lead to the development of specific and focused interventions for temperament and character profiles in HD and PD patients. We suggest that evaluation and treatment of ESRD patients should also include psychosomatic approaches in clinical practice.

Key words: Hemodialysis, peritoneal dialysis, personality, temperament and character, depression, anxiety

Bulletin of Clinical Psychopharmacology 2011;21(3):201-9

[1]MD, Assistant Professor, Kahramanmaras Sutcuimam University Faculty of Medicine Department of Psychiatry, 46100 Kahramanmaras-Turkey
[2]MD, Assistant Professor, Inonu University Faculty of Medicine Department of Public Health, Malatya-Turkey
[3]MD, Associate Professor, Kahramanmaras Sutcuimam University Faculty of Medicine Department of Internal Medicine, Division of Nephrology, 46100, Kahramanmaras-Turkey
[4]MD, Kahramanmaras State Hospital, Psychiatry, Kahramanmaras-Turkey
[5]MD, Kahramanmaras State Hospital, Internal Medicine, Kahramanmaras-Turkey

Yazışma Adresi / Address reprint requests to: MD Assistant Professor Fatma Özlem Orhan, Kahramanmaras Sutcuimam University Faculty of Medicine Department of Psychiatry, 46100, Kahramanmaras-Turkey

Telefon / Phone: +90-344-221-2337/106

Faks / Fax: +90-344-221-2371

Elektronik posta adresi / E-mail address: fozlemorhan@yahoo.com

Gönderme tarihi / Date of submission: 23 Şubat 2011 / February 23, 2011

Kabul tarihi / Date of acceptance: 01 Mayıs 2011 / May 01, 2011

Bağıntı beyanı:
F.O.O., A.O., H.S., E.D., O.A., O.A., M.F.K., A.T.: Yazarlar bu makale ile ilgili olarak herhangi bir çıkar çatışması bildirmemişlerdir.

Declaration of interest:
F.O.O., A.O., H.S., E.D., O.A., O.A., M.F.K., A.T.: The authors reported no conflict of interest elated to this article.

INTRODUCTION

Like many chronic diseases, end-stage renal disease (ESRD) may affect the psychological state of patients and psychological disorders are prevalent among patients with ESRD (1). These findings may be explained by the complex treatment regimens that patients with ESRD undergo, which involve not only dialysis, but also a wide range of multiple and radical lifestyle changes that effect the individual's social and psychological functioning (2) by severe restriction of patients' activities and creation of feelings of isolation (3). ESRD patients often feel helpless in dealing with their disease (4). These persistent stressors can lead to psychological problems such as depression and anxiety, which are common in ESRD patients receiving chronic hemodialysis (HD). The rates of depression and anxiety range between 20 and 70% and between 30 and 60%, respectively (5-7). Regarding mental health, HD patients have been found to experience more depressive symptoms than peritoneal dialysis (PD) patients. The depression may be linked to the HD treatment modality (8,9); however, the exact prevalence of depressive symptoms across dialysis modalities remains questionable, as research has tended to focus on the HD population and

neglect patients receiving PD (10).

Living with an ESRD is a severe psychological stressor, and it is likely that the patient's dominant defense style may determine his or her psychological response and consequently his or her compliance with or adherence to treatment as well as treatment preferences. The response results from the activation of a cluster of defense mechanisms and is associated with the patient's capacity to cope with stressors (11). Therefore, studies have been conducted on personality patterns (which are regarded as psychosocial factors for dialysis patients), and some studies reported findings on the role of the "coping strategies" personality variable in HD patients (12). Baydogan and Dag studied locus of control and other personality variables such as learned resourcefulness (coping) and the sociotropy-autonomy dimension in dialysis patients (13).

The dimensional approach of the psychobiological model of personality by Cloninger investigates seven personality traits referring to temperament and character. It uses the Temperament and Character Inventory (TCI) as an instrument of evaluation (14,15). In this instrument, novelty seeking (NS), harm avoidance (HA), reward dependence (RD), and persistence (P) are four dimensions of temperament, while self-directedness (SD), cooperativeness (C), and self-transcendence (ST) emerge as three dimensions of character.

Most of the previous studies mainly focused on depression and anxiety in ESRD patients treated with HD and PD. There are few studies on personality patterns of dialysis patients. However, to the best of our knowledge, no studies have addressed the temperament and character variables in such a sample of patients, nor have there been any studies in Turkey addressing these factors in HD and PD patients. The aim of the present study was to examine, if HD and PD patients have common specific personality traits (as evaluated by the TCI self-report questionnaire) and if there is any relationship between the TCI and laboratory variables.

METHODS

Participants

In a case-controlled design, 39 HD and 30 PD patients who had been on dialysis for at least 3 months were randomly selected from our registry of ESRD patients during 2009 and 2010 in the Dialysis Unit of Kahramanmaras Sutcu Imam University and Kahramanmaras State Hospital Dialysis Center. The enrolled HD patients were treated with stable, regular hemodialysis using bicarbonate dialysate. All subjects underwent dialysis for 4 hours, three times per week, starting at 7 AM. All of the PD patients were on continuous ambulatory PD using a disconnect system. All patients were treated with four exchanges daily using 1500–2000 mL Dianeal PD4 (Eczacibasi-Baxter Hospital Products, Istanbul, Turkey) in which the glucose concentration was adjusted according to the patient's need for ultrafiltration. Criteria for inclusion of the patients were as follows: having HD or PD for more than 3 months and being a coherent volunteer open to cooperation. Exclusion criteria included: History of alcohol or substance abuse, inability to complete the questionnaires (e.g., deafness, reading problems), previous diagnosis of psychotic or neurological disorder or dementia, and exacerbation of physical conditions requiring hospital admission. The control group consisted of 39 individuals selected from volunteers who had been hospitalized for normal health check-ups or who were undergoing a regular company medical check-up. They did not have a family history of hypertension or any physical or psychological symptoms and did not receive any psychological therapy. The patient and control groups were matched for gender, age, and occupation ($P > 0.05$).

Ethical Considerations

This study was approved by the ethics committee of Kahramanmaras Sutcu Imam University, School of Medicine and conducted according to the ethical standards of the Helsinki Declaration of 2000. All subjects signed written informed consent.

Procedure

The study was carried out at the Dialysis Unit of Kahramanmaras Sutcu Imam University and Kahramanmaras State Hospital Dialysis Center, Turkey. During clinic visits, the researchers identified patients who met the inclusion criteria and were willing to participate in the study. The following demographic, clinical, and laboratory data were recorded or determined for each

patient at the moment of inclusion in the study: age, gender, marital status, education, occupation, HD and PD regimen, duration on dialysis, depression and anxiety, hemoglobin, serum albumin, parathyroid hormone (PTH) levels, Kt/V index.

The patients completed questionnaires at home or in the hospital during dialysis treatments. These questionnaires were completed alone or with the help of relatives in cases where the participant had inadequate education to understand the questions or was too tired.

Measures

Temperament and Character Inventory [TCI]:

This self-reported scale consists of 240 items with "true" or "false" as response options. It can be applied to individuals 17 years of age or older. It consists of seven main scales formed by four dimensions of temperament [novelty seeking, harm avoidance, reward dependence, and persistence] and 3 dimensions of character [self-directedness, cooperativeness, and self-transcendence] and 24 subscales of these scales. It has been commonly used in different areas of psychological and psychiatric research and practice in the last 10 years. The TCI was developed by Cloninger (14) and the Turkish version of the TCI has been validated by Kose et al. (16,17).

The Hospital Anxiety and Depression Scale

The Hospital Anxiety and Depression Scale (HADS) is a self-reported questionnaire for hospital outpatients in medical or surgical departments used to assess anxiety and depression as two dimensions (19). The score for each subscale ranges from zero to 21. The higher the score the worse the status with respect to that particular category (18). There have been reports that the HADS may have some utility as a screening and assessment instrument in patients with end-stage renal disease (ESRD) undergoing peritoneal dialysis (PD). Aydemir tested the validity and reliability of the HADS in Turkish (19).

Data Analysis

Statistical analysis was performed by SPSS 15.0 software (SPSS, Chicago, IL, USA). All data were expressed as mean ± SD (standard deviation) and as percentages. All data were first analyzed for normality of distribution using the Kolmogorov-Smirnov test of normality. The two patient and one control group were compared according to their sociodemographic features by using the Chi-square and according to their subscores from the TCI using a one-way ANOVA and Bonferroni post-hoc test. Differences among categorical variables were analyzed using the Chi-square test or the Fisher's exact test as appropriate. Correlation analysis was performed by Pearson's for parametric variables and Spearman's correlation analysis for non-parametric variables. P values <0.05 (two-tailed) were considered statistically significant.

Kt/V parameters were expressed as dichotomous outcomes (≥2 vs. <2 for PD; ≥1.2 vs. <1.2 for HD) based on consideration of the values' clinical relevance for ESRD patients.

RESULTS

Sixty-nine patients and 39 healthy controls were included in the study. There were 39 patients in the HD group and 30 patients in the PD group. Table 1 displays the age, sex, education, and occupation of the three groups. Among the groups, there were no statistically significant differences with regard to age, sex, or occupation. The mean ages (±SD) of HD patients, PD patients, and healthy controls were 38.64±11.29 years, 42.76±16.94 years, and 35.30±9.09 years, respectively (P > 0.05).

The distribution of HADS scores of the patient group is shown in Table 2. The ratio of patients who were over the threshold of the HADS depression subscale was 59% (23/39 patients) in the HD group and 40% (12/30 patients) in the PD group. The ratio of patients who were over the threshold of the anxiety subscale was 23.1% (9/39 patients) in the HD group and 13.3% (4/30 patients) in the PD group. There were no statistically significant differences between the two groups in terms of being over the threshold; (P >0 .05) results are provided in Table 2.

The comparison of the TCI scales between HD patients, PD patients, and control subjects is shown in Table 3. The three groups were compared by the one-way ANOVA test, and both HD and PD patient groups were significantly different from healthy controls regarding the scores of novelty seeking (Exploration-excitability (P=0.033) and

Table 1: Socio-demographic variables of patients and controls

Sociodemographic variables	Hemodialysis (n=39)	%	Peritoneal dialysis (n=30)	%	Healthy control (n=39)	%	P
Gender							
Female	24	(37.5)	16	(25.0)	24	(37.5)	0.739
Male	15	(34.1)	14	(31.8)	15	(34.1)	
Marital status							
Married	29	(40.8)	22	(31.0)	20	28.2	0.024
Single	6	(20.0)	6	(20.0)	18	60	
Divorced/widowed	39	(36.1)	2	(28.6)	1	14.3	
Living place							
Village	8	(53.3)	6	(40.0)	1	(6.7)	0.002
Town	7	(53.8)	6	(46.2)	0	(0)	
City	24	(30.0)	18	(22.5)	38	(47.5)	
Education							
Illiterate	10	(62.5)	6	(37.5)	0	(0)	<0.001
Read And Write	6	(66.7)	3	(33.3)	0	(0)	
Primary	17	(47.2)	14	(38.9)	5	(13.9)	
High school and college	6	(12.8)	7	(14.9)	34	(72.3)	
Occupation							
Working	13	29.5	10	22.7)	21	47.7	0.114
Not Working	26	40.6	20	31.3)	18	28.1	
Dialysis duration (months)	37.30±38.53		20.65±22.92		-		0.040

Table 2: The ratio of patients from both study groups that were over the threshold according to the hospital anxiety and depression scale

	Depression		Anxiety	
	Number of cases over the threshold	%	Number of cases over the threshold	%
Hemodialysis	23	59	9	23.1
Peritoneal dialysis	12	40	4	13.3
p	0.118[a]		0.365[b]	

[a]chi-square, [b]Fisher's exact test

impulsiveness (P=0.045)), harm avoidance (Fatigability (P=0.012)), and reward dependence (dependence (P=0.005)) subscales in the temperament dimensions, and self-directedness (resourcefulness (P=0.003) and enlightened second nature (P<0.001)) subscales in the character dimensions. There were significant differences between PD patients and the control group in the reward dependence (sentimentality (p=0.030)) and cooperativeness (compassion (p=0.037)) scores. Additionally, there were significant differences between HD patients and the control group in the attachment subscale of reward dependence (p=0.017) and self-directedness (p=0.021)) scores.

We computed Pearson's product to evaluate the relationships between TCI scores, laboratory variables, and dialysis duration. We used Spearman's correlation to evaluate the relationship between TCI and Kt/V in the HD and PD groups. There was no correlation between Kt/Vor parathyroid hormone (PTH) levels, and TCI scores. As detailed in Table 4, there was a negative correlation between hemoglobin and harm avoidance scores (p=0.024, r=-0.360) and a significant positive correlation between serum albumin and depression scores (p= 0.034, =0.340) in the HD group. There was a significant negative correlation between dialysis duration and persistence scores (p=0.023, r=-0.415) in the PD group. In addition, Ferritin correlated positively with harm avoidance and depression scores (p= 0.044, r=0.370) in the PD group (Table 4).

Table 3: Comparison of the temperament and character subdimensions in hemodialysis patients, peritoneal dialysis patients, and healthy controls

Temperament and character subdimensions	Hemodialysis (n=39)	Peritoneal dialysis (n=30)	Healthy control (n=39)	P
NS1 (Exploration-excitability)	5.43±1.56	5.23±2.04	6.33±2.02*	0.033
NS2 (Impulsiveness)	3.58±1.37	3.66±1.51	4.58±2.55*	0.045
NS3 (Extravagance)	3.4±1.92	3.23±1.61	4.51±1.98	0.008
NS4 (Disorderlines)	3.61±1.59	3.06±1.52	3.87±2.45	0.229
NS Novelty Seeking	16.05±3.71	15.20±3.46	19.30±6.95*	0.002
HA1 (Anticipatory worry)	5.74±1.85	5.83±1.91	5.28±1.94	0.419
HA2 (Fear of uncertainty)	4.79±1.59	4.86±1.16	4.15±1.77	0.102
HA3 (Shyness with strangers)	3.35±1.84	3.23±1.52	3.33±2.09	0.959
HA4 (Fatiguability and asthenia)	5.12±1.92	4.96±1.60	3.97±1.79*	0.012
HA Harm Avoidance	19.02±5.32	18.90±3.31	16.74±5.35	0.078
RD1 (Sentimentality)	7.30±1.77	7.90±1.64**	6.74±1.84**	0.030
RD3 (Attachment)	4.30±1.77***	4.70±1.53	5.35±1.49***	0.017
RD4 (Dependence)	2.25±1.33	2.26±1.14	3.07±1.13*	0.005
RD Reward Dependence	13.87±3.01	14.86±3.03	15.17±2.83	0.134
P Persistence	4.84±1.40	5.23±1.38	4.51±1.63	0.141
SD1 (Responsibility)	4.46±1.31	4.36±1.77	4.74±1.95	0.621
SD2 (Purposefulness)	5.43±1.46	5.56±1.35	5.64±1.57	0.847
SD3 (Resourcefulness)	2.43 ± 1.23	2.33±1.15	3.33±1.52*	0.003
SD4 (Self-acceptance)	5.79 ± 2.49	5.43±2.55	5.92±2.44	0.711
SD5 (Enlightened 2nd nature)	6.92±1.57	7.40±1.90	8.92±2.00*	<0.001
SD Self-Directedness	25.05±4.84***	25.10±6.04	28.56±7.30***	0.021
C1 (Social acceptance)	5.51±1.60	6.23±1.40	5.71±1.87	0.197
C2 (Empathy)	4.25±1.25	4.16±1.44	4.53±1.16	0.439
C3 (Helpfulness)	4.43±1.27	4.90±1.32	4.89±1.29	0.208
C4 (Compassion)	7.61±1.99	7.96±1.80**	6.66±2.57**	0.037
C5 (Integrated conscience)	6.30±1.76	6.46±1.52	6.33±1.79	0.922
C Cooperativeness	28.12±4.46	29.7±4.82	28.15±6.64	0.399
ST1 (Self forgetfulness)	5.43±2.30	6.30±2.49	5.51±2.32	0.269
ST2 (Transpersonal identity)	5.61±1.82	5.93±1.50	4.84±2.20	0.050
ST3 (Spiritual acceptance)	7.07±2.10	8.03±1.71	6.87±2.24	0.081
ST Self-Transcendence	18.12±4.67	20.26±4.71	17.23±5.80	0.051

*p values between dialysis groups and healthy controls
**p values between hemodialysis group and the other two groups
*** p values between peritoneal dialysis and other two groups

DISCUSSION

To our knowledge, this is the first study to compare temperament and character profiles of ESRD patients with two different forms of renal replacement therapy (HD and PD) and a control group. The main findings reveal that the main dimensions of temperament and character in HD and PD patients were similar to those in healthy individuals except novelty seeking. Additionally, HD patients were different from controls regarding self-directedness scores. However, when we looked at the subdimensions of exploratory excitability, impulsiveness, fatigability, dependence, resourcefulness, and enlightened second nature, scores of patients were significantly different from those of the control group. Lower novelty seeking scores in HD and PD patients may be due to their being more stoical, unenthusiastic, rigid, and tolerant of monotonous states. They may have less motivation to explore new things and be more orderly than other patient groups and controls. Actually, many dialysis patients become socially isolated and limited in their lives (3). In the present study, the NS subscale exploratory excitability (NS1) scores were lower among the patient group than the controls. The lower scores observed in the present study concerning the NS1 subscale could indicate the difficulties patients have initiating novel behavior and actively exploring their

Table 4: Correlation of TCI scores and laboratory

	Statistical Values	Dialysis duration (months)	Ferritin	Serum Albumin (g/dl)	Kt/V (dialysis adequacy)	Hb(g/dl)	PTH
Hemodialysis							
Novelty Seeking	P	0.279	0.215	0.868	0.119	0.993	0.357
	R	-0.178	-0.203	0.027	-0.254	0.001	0.152
Harm Avoidance	P	0.086	0.083	0.101	0.917	0.024	0.557
	R	-0.278	0.281	-0.267	0.017	-0.360	-0.097
Reward Dependence	P	0.314	0.107	0.805	0.814	0.535	0.196
	R	0.166	0.262	-0.041	-0.039	-0.102	-0.212
Persistence	P	0.779	0.650	0.161	0.186	0.559	0.985
	R	-0.046	-0.075	0.229	0.216	-0.096	-0.003
Self-Directedness	P	0.066	0.415	0.653	0.622	0.859	0.972
	R	0.297	0.134	-0.074	0.081	-.029	0.006
Cooperativeness	P	0.134	0.117	0.477	0.155	0.171	0.390
	R	0.244	0.255	0.117	0.232	-0.224	-0.141
Self-Transcendence	P	0.105	0.087	0.054	0.735	0.519	0.461
	R	0.264	0.278	0.312	-0.056	-0.107	0.122
Depression	P	0.621	0.875	0.034	0.608	0.135	0.248
	R	0.082	-0.026	0.340*	0.085	0.244	0.189
Anxiety	P	0.770	0.182	0.269	0.666	0.974	0.896
	R	0.048	0.218	0.181	-0.071	-0.005	-0.022
Peritoneal dialysis							
Novelty Seeking	P	0.404	0.391	0.947	0.268	0.168	0.101
	R	0.158	0.163	-0.013	0.241	0.268	0.305
Harm Avoidance	P	0.874	0.044	0.717	0.786	0.793	0.280
	R	0.030	0.370	-.069	-0.060	0.052	-0.204
Reward Dependence		0.942	0.410	0.565	0.856	0.612	0.285
		0.014	-0.156	-0.109	0.040	-0.100	0.202
Persistence	P	0.023	0.744	0.430	0.061	0.734	0.420
	R	-0.415	0.062	0.150	-0.396	-0.067	-0.153
Self-Directedness	P	0.390	0.088	0.731	0.450	0.636	0.642
	R	0.163	-0.317	-0.065	-0.166	-0.094	0.089
Cooperativeness	P	0.199	0.325	0.713	0.426	0.116	0.864
	R	-0.241	0.186	0.070	-0.174	-0.304	0.033
Self-Transcendence	P	0.163	0.077	0.855	0.431	0.152	0.0824
	R	-0.262	0.328	0.035	0.173	-0.278	-0.042
Depression	P	0.183	0.030	0.647	0.105	0.203	0.966
	R	0.250	0.397	-0.087	-0.347	0.248	-0.08
Anxiety	P	0.881	0.127	0.624	0.245	0.120	0.477
	R	-0.029	0.285	-0.093	-0.252	0.301	-0.135

environments (20).

HD and PD patients score high on the fatigability subscale, which means they appear to be asthenic and to have less energy than healthy people do. They often need naps or extra rest periods, because they become tired very easily. These people typically recover more slowly from minor illnesses or stress than healthy people (21,22). The higher fatigability scores in HD and PD patients were expected, since significant fatigue is the cardinal symptom of ESRD.

Low scorers on the dependence subscale neither depend on nor actively seek emotional support and approval from other people. These individuals are not sensitive to social pressure and criticism. They rarely yield to the wishes of others and typically do not try to please others in order to get protection or emotional support. Rather, they present themselves to others as independent, self-sufficient, and unresponsive to social pressure (21,22). In contrast with these findings, PD patients scored high on the sentimentality subscale. These people are described as sentimental, sympathetic, understanding individuals who tend to be deeply moved by sentimental appeals. They tend to show their emotions easily in the presence of others. They report that they experience delegated

emotions intensely, that is, they personally experience what others around them are feeling. It is difficult to explain such results (21,22).

Hemodialysis patients had low scores on the self-directedness scale, and individuals, who are low in self-directedness, are described as immature, weak, fragile, blaming, destructive, ineffective, irresponsible, and unreliable. They seem to be lacking an internal organizational principle, which renders them unable to define, set, and pursue meaningful goals (21,22). In addition, individuals with low self-directedness do not expect to be able to control and positively influence an aversive situation and overcome obstacles. Self-directedness is closely related to the concept of self-efficacy. Self-efficacy is defined as the personal conviction that one can successfully show problem-solving behavior in a given situation (23). However, lower self-directedness may be an artifact of illness. Higher levels of depression may also explain the lower self-directedness scores in the HD sample; however, the self-directedness scores of PD patients were not different from those of controls, although depression scores in the HD and PD groups were similar.

HD patients undergo dialysis for four hours at a hospital or clinic per session of dialysis and the patient has to be continually connected to the hemodialysis machine during dialysis and that means they are away from their homes approximately three times per week for several hours (24). This would have a definite effect on their career plans, employment status, financial situation, self-esteem, and level of independence (25), hence they would experience significant restrictions in independent living (8,9). PD requires placement of a catheter into the abdominal cavity. This catheter is used for daily repeated instillation and drainage of sterile dialysate administered by the patients typically three or four times a day. This differs from HD, which requires access to the circulatory system and is performed at a hospital by medical staff. PD affords greater autonomy for patients but necessitates a greater level of involvement in their treatment (10). Those undergoing PD need to learn aseptic technique in order to perform the procedure at home. They often worry about the risk of peritonitis as well as of incurring adverse physical and psychosocial effects because of lower levels of contact with healthcare professionals (26).

A recent report by Will et al. suggested that dialysis results in a loss of autonomy for the patient (27). Conversely, Demir et al. found that the mean autonomy and sociotropy scores of PD patients were higher than those of controls (28). As with the higher autonomy scores, the self-directedness scores of PD patients were similar to those of the controls and lower in the HD group. This may be because self-directedness may be a factor of the patient's personality directing the physician and patient towards PD during the selection of treatment modality or because the PD treatment itself both requires and teaches self-sufficiency.

The present study found that HD and PD patients and healthy people obtained similar self- transcendence scores, suggesting that there is no deleterious impact of HD or PD on ST. Our results differ markedly from those of Karaca et al. (29) who reported differences between chronic renal failure patients and controls in persistence scores, as we did not find any difference in persistence scores between the patient and control groups. However, we found a negative correlation between dialysis duration and persistence scores, such that when the duration of dialysis increased, persistence scores decreased. Persistence is defined as perseverance despite frustration and fatigue. Low scorers manifest a low level of perseverance and repetitive behaviors even in response to intermittent reward.

In this study, the relationship between the dimensions of personality, duration of dialysis and dialysis type, psychometric variables such as depression and anxiety and laboratory variables were evaluated. For each parameter, the correlation analysis, in which each variable was used as covariant, was done. The correlations with TCI scores and laboratory variables were very limited, and in particular, we did not find a statistically significant correlation between the TCI scores and the Kt/V index. Einwohner et al. (30) found that elevated levels of depressive symptoms as measured by the Zung scale were associated with older age, lower serum albumin and a higher risk of mortality in patients on peritoneal dialysis. Lopes et al. (31) reported similar findings for a multinational sample of hemodialysis patients. In our study there was a positive correlation between serum albumin and depression scores in the HD group and a positive correlation between ferritin and depression scores in the PD group. This may be due to the waxing and waning character of depression and only one measurement at one point in time rather than longitudinal repeated

measurements might have missed some depressed patients (32). It is difficult to explain such results. This may partially be due to cross-sectional nature of the study in which depressive patients may not have depression severe or long enough to alter biochemical profiles or medical outcomes (32). Additionally we can hypothesize that such correlations are an expression of a relationship between depressive symptoms and nutritional status.

In our study, there was no significant difference between HD and PD patients' HADS scores. The scores were similar to the previous results; Sağduyu et al. (33) found the ratio of patients who were over the HADS depression subscale threshold was 40%, while it was 12% in HD patients on the HADS anxiety subscale. Studies of depression in PD patients are fewer in number than those in HD (34-37). In a study of prevalent PD patients, one-third of the patients had depressive symptoms based on the Zung Self-rating Scale (34). Because data regarding the prevalence of anxiety are scarce, the exact nature of its effects on patients with ESRD is also unknown. In our study, there was no correlation between depression and anxiety scores and dialysis duration. A Canadian study of 99 dialysis patients (38) and an American study of 128 dialysis patients suggested that depression or anxiety was associated with short duration of dialysis (39). On the other hand, an American study of 149 HD patients, as well as a Swedish study of 700 HD patients, suggested that depression was not associated with the duration of HD (40,41).

When interpreting our results, it is important to note some limitations of our study. First, our sample size was relatively small, hence it may not be representative of all dialysis patients. Further studies are required to confirm these results in larger clinical samples. Second, we can draw no conclusions about cause-and-effect relationships because of the data's cross-sectional nature. Finally, we used self-reported questionnaires to evaluate psychiatric symptoms; clinician administered structured interviews and scales could yield more reliable findings. In conclusion, this study suggests that dialysis patients have distinctive temperament dimensions compared to healthy controls. Further studies are needed to determine the relationship between patterns of temperament and character dimensions and ESRD, including following longitudinal courses of patients.

References:

1. Tavallaii SA, Lankarani MM. Improved mental health status in the first 2 weeks after kidney transplantation. Transplant Proc 2005; 37(7):3001-3.
2. Tsay SL, Healstead M. Self care self-efficacy, depression, and quality of life among patients receiving hemodialysis in Taiwan. Int J Nurs Stud 2002;39(3):245-51.
3. Weilitz PC, Sciver TV. Nursing role in management obstructive pulmonary disease. In Medical Surgical Nursing, 4th edn (Lewis SM, Collier IC & Heitkemper MM eds). Mosby Year Book, Inc., St. Louis; 1996:701-30.
4. Tsay SL Acupressure and fatigue in patients with end stage renal disease – a randomised controlled trial. Int J Nurs Stud 2004;41(1):99-106.
5. Kimmel PL, Cukor D, Cohen SD, Peterson RA. Depression in endstage renal disease patients: a critical review. Adv Chronic Kidney Dis 2007;14(4):328-34.
6. Cukor D, Coplan J, Brown C, Friedman S, Cromwell-Smith A, Peterson RA, Kimmel PL. Depression and anxiety in urban hemodialysis patients. Clin J Am Soc Nephrol 2007; 2(3):484-90.
7. Cukor D, Coplan J, Brown C,Friedman S, Newville H, Safier M, Spielman LA, Peterson RA, Kimmel PL. Anxiety disorders in adults treated by hemodialysis: a single-center study. Am J Kidney Dis 2008;52(1):128-36.
8. Oikonomidou G, Zlatanos D, Vayopoulos H, Hatzidimitriou H. Depression in patients with chronic renal failure. Dialysis Living 2005;14:22-32.
9. Yucedal C, Olmez N, Gezen G, Celik F, Altindag A, Yilmaz ME, et al. Depression in renal dialysis patients. European Dialysis and Transplant Nurses Association-European Renal Care Association Journal. 2003; 29(3):151-5.
10. Griva K, Davenport A, Harrison M, Newman S. An evaluation of illness, treatment perceptions, and depression in hospital- vs. home-based dialysis modalities. J Psychosom Res 2010;69(4):363-70.
11. Hyphantis T, Kaltsouda A, Triantafillidis J, Platis O, Karadagi S, Christou K, et al. Personality correlates of adherence to type 2 diabetes regimens. Int J Psychiatry Med. 2005; 35(1):103-7.
12. Mok E, Tam B. Stressors and coping methods among chronic haemodialysis patients in Hong Kong. J Clin Nurs 2001; 10(4):503-11.
13. Baydoğan M, Dağ I. Prediction of depression by locus of control, learned resourcefulness and sociotropy-autonomy in hemodialysis patients. Turk Psikiyatri Derg 2008;19(1):19-28.
14. Cloninger CR, Svrakic DM, Przybeck TR. A psychobiological model of temperament and character. Arch Gen Psychiatry 1993;50(12):975-90.

15. Cloninger CR. Temperament and personality. Curr Opin Neurobiol 1994 ;4(2):266-73.

16. Kose S, Sayar K, Kalelioglu U, Aydin N, Ak I, Kirpinar I, et al. The Turkish version of the TCI: reliability, validity, and factorial structure. Klinik Psikofarmakoloji Bülteni - Bulletin Clinical Psychopharmacology 2004;14:(3)107-31.

17. Kose S, Sayar K, Kalelioglu U, Aydin N, Celikel F, Gulec H, et al. Normative data and factorial structure of the Turkish version of the Temperament and Character Inventory (TCI). Comprehensive Psychiatry 2009;50(4):361-8.

18. Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. Acta Psychiatr Scand1983;67(6):361-70.

19. Aydemir O. Validity and Reliability of Turkish Version of Hospital Anxiety and Depression Scale. Turk Psikiyatri Derg 1997;8(4):280-7.

20. Celikel FC, Kose S, Cumurcu BE, Erkorkmaz U, Sayar K, Borckardt JJ, et al. Cloninger's temperament and character dimensions of personality in patients with major depressive disorder. Compr Psychiatry 2009;50(6):556-561.

21. Cloninger CR. A systematic method for clinical description and classification of personality variants. A Proposal. Arch Gen Psychiatry1987;44(6):573-88.

22. Cloninger CR, Przybeck TR, Svrakic DM, Wetzel RD. The temperament and character inventory (TCI): a guide to its development and use. St. Louis, MO: Center for Psychobiology of Personality, Washington University;1994. p. 67-81.

23. Bandura A, Cervone D. Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. J Pers Soc Psycho l198;3(5):1017-28.

24. Dunn SA. How to care for the dialysis patient. Am J Nurs 1993;93(6):26-33.

25. Noshad H, Sadreddini S, Nezami N, Salekzamani Y, Ardalan MR. Comparison of outcome and quality of life: haemodialysis versus peritoneal dialysis patients. Singapore Med J 2009;50(2):185-92.

26. Sosa-Guerrero S, Gomez NJ. Dealing with end-stage renal disease. Am J Nurs 1997; 97(10):44-51.

27. Will T, Saudan P, Droulez MG, Soulignac R, Martin PY. Relationship and dependency in a hemodialysis unit. Nephrol Ther. 2008;4(5):320-4.

28. Demir S, Tufan G, Erem O. Sociotropic or autonomous personality and problem solving in peritoneal dialysis patients. J Int Med Res 2010;38:1491-6.

29. Karaca S, Emul M, Kulac M, Yuksel S, Ozbulut O, Guler O, et al. Temperament and character profile in patients with essential hyperhidrosis. Dermatology 2007;214(3):240-5.

30. Einwohner R, Bernardini J, Fried L, Piraino B. The effect of depressive symptoms on survival in peritoneal dialysis patients. Perit Dial Int 2004;24(3):256-3.

31. Lopes AA, Albert JM, Young EW, Satayathum S, Pisoni RL, Andreucci VE, et al. Screening for depression in hemodialysis patients: associations with diagnosis, treatment, and outcomes in the DOPPS. Kidney Int 2004;66(5):2047-53.

32. Atalay H, Solak Y, Biyik M, Biyik Z, Yeksan M, Uguz F, et al. Sertraline treatment is associated with an improvement in depression and health related quality of life in chronic peritoneal dialysis patients. Int Urol Nephrol 2010;42(2):527-6.

33. Sağduyu A, Sentürk VH, Sezer S, Emiroğlu R, Ozel S. Psychiatric problems, life quality and compliance in patients treated with haemodialysis and renal transplantation. Turk Psikiyatri Derg 2006;17(1):22-1.

34. Mittal SK, Ahern L, Flaster E, Mittal VS, Maeske JK, Fishbane S. Self-assessed quality of life in peritoneal dialysis patients. Am J Nephrol 2001;21(3):215-20.

35. Wuerth D, Finkelstein SH, Ciarcia J, Peterson R, Kliger AS, Finkelstein FO. Identification and treatment of depression in a cohort of patients maintained on chronic peritoneal dialysis. Am J Kidney Dis 2001;37(5):1011-17.

36. Juergensen PH, Wuerth DB, Juergensen DM, Finkelstein SH, Steele TE, Kliger AS, et al. Psychosocial factors and clinical outcome on CAPD. Adv Perit Dial 1997;13(2):121-4.

37. Lye WC, Chan PS, Leong SO, van der Straaten JC. Psychosocial and psychiatric morbidity in patients on CAPD. Adv Perit Dial 1997;13(2):134-6.

38. Graven JL, Rodin GM, Johnson L, Knnedy SH. The diagnosis of major depression in renal dialysis patients. Psychosom Med 1987;49(5):482-92.

39. Kutner NG, Fair PL, Kutner MH. Assessing depression and anxiety in chronic dialysis patients. J Psychosom Res1985;29(1):23-1.

40. Theorell T, Konarsky-Svensson JK, Ahlmen J, Persky A. The role of paid work in Swedish chronic dialysis patients—a nation-wide survey paid work and dialysis. J Intern Med 1991;230(6):501-9.

41. Kimmel PL, Peterson RA, Weihs KL, Simmens SJ, Boyle DH, Cruz I.et al. Aspects of quality of life in hemodialysis patients. J Am Soc Nephrol 1995;6(5):1418-26.