Factors affecting therapeutic compliance in patients with chronic renal failure: Anxiety, Depression, Illness Perception

Dilek Acar¹ and Zeynep Güneş^{2*}

¹Institute of Health Sciences, Adnan Menderes University, Aydın, Turkey

²Department of Medical Nursing, Adnan Menderes University, Aydın, Turkey

Abstract

Aim: This study was conducted so as to determine the levels of adherence to treatment of the patients with chronic renal failure, and to evaluate the relationship between anxiety, depression, illness perception and adherence to treatment.

Method: A total of 236 patient participated in this study. Data were collected with Non-Adherence Questionnaire to Dialysis Diet and Fluid Restriction, Morisky Medication Adherence Scale, Illness Perception Questionnaire, Beck Depression and Anxiety Inventory.

Results: It was found that 36,4% of the patients adhered to their diet, 37,3% of them adhered to fluid restriction and 50,8% of them adhered to drug treatment. Women compared to men, those receiving treatment in a hospital compared to those receiving treatment in private centers, those having information about disease management compared those not having information about disease management, and those having efficient communication with medical staff compared to those not having efficient communication with medical staff have adhered to treatment diet significantly. As the level of anxiety and depression increases, the adherence to the treatment diet decreases. Personal control, treatment benefit, and the perception of understanding the illness that are the sub-dimensions of illness perception have affected the adherence to the treatment diet. Conclusion: While positive perception of illness affects the adherence to treatment positively, anxiety and depression affect it negatively.

Introduction

According to the data of Public Health Agency of Turkey Ministry of Health, chronic renal failure (CRF) is a progressive chronic disease which affects nearly 2.4 million people in our society and causes death. The most common method used in the treatment of the patients is dialysis treatment [1].

Individual management becomes prominent in adherence to the illness and treatment in CRF that is a chronic illness [2-4]. Adherence of the patients to the treatment is an important indicator showing that chronic diseases are managed successfully [5]. Adherence of the patients to diet, salt, fluid restrictions and drug treatment is considered as important in effective management of the problems to be faced with, increasing the success of the treatment, and reducing the morbidity and mortality [6]. However, studies showed that patients could not adhere to diet, fluid restrictions and drug treatment at the desired level.

In the literature, the factors affecting the adherence to the treatment are grouped as the factors related to treatment regimen, psychosocial and economic factors, the factors related to healthcare system and the factors related to illness. At the same time, age, cultural structure, side effects of the treatment, cost of the treatment, feelings of the patient about the treatment, social support resources and illness perception affect the adherence to the treatment [7,8]. Illness perception that is one of the factors affecting the adherence to the treatment is an important factor affecting several areas from psychological adjustment to the course of the disease. It is known that illness experience and illness perception are different for each individual, that the various factors

making this difference are the determinants of the behavior that the individual will exhibit in case of illness, and that there is a relationship between the emotional reactions that individuals give to the illness and the illness perception [9-12].

Identifying the factors affecting the adherence of the patients to the treatment process in the patients with chronic renal failure can help to plan effective steps to remove these factors. It may also contribute to decrease the morbidity and mortality rates based on the illness.

Aim

It has been observed that the studies determining the levels of the adherence of the patients to the treatment, anxiety, depression and illness perception are very limited in our country.

Material and Method

The population of the study consisted of 483 patients undergoing hemodialysis (HD) treatment due to end-stage renal failure in the hospitals and private dialysis centers in the city centre of Aydın and the sample of the study consisted of 236 patients determined by random

*Correspondence to: Zeynep Güneş PhD, Nursing Faculty, Department of Medical Nursing, Adnan Menderes University, Aydın, Turkey, Tel: (90) 256 2138866; Fax: (90) 256 2124219; Email: zeynep_adu@hotmail.com/zeynepadu@gmail.com

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sampling method. Data were collected by face-to-face method and “Personal Information Form”, “Non-Adherence To Dialysis Diet and Fluid Restriction Questionnaire”, “Eight Item Morisky Medication Adherence Scale”, “Beck Depression Inventory”, “Beck Anxiety Inventory” and “Revised Illness Perception Questionnaire” were used.

Non-Adherence to Dialysis Diet and Fluid Restriction Questionnaire: It was developed by Vlaminc, *et al* [13] so as to evaluate the non-adherence of the individuals undergoing HD to diet and fluid restriction. Reliability and validity of the questionnaire were tested by Kara [14] in Turkey and cronbach alpha coefficient was found as 0.70.

Eight Item Morisky Medication Adherence Scale (MMAS-8): It is one of the eight-item tools that measures the adherence. It is based on patient report, and it is used in evaluating the adherence to drug [15]. The reliability of the scale was tested by Hacıhasanoğlu Aşlar, *et al.* in 2014 [2] and the cronbach alpha coefficient of the scale was found as 0.79.

Beck Depression Inventory (BDI): It was developed by Beck *et al* in 1961. Reliability and validity of the inventory were tested by Hisli [16] in Turkey and cronbach alpha coefficient of the 21-item inventory was found as 0.80. The increase in the score obtained from the inventory shows excessive depressive signs. The depression level according to the score obtained from the inventory is defined as “No Depression” for 0-9 score, “Mild” for 10-16 score, “Moderate” for 17-29 score, and “Severe” for 30-63 score [16,17].

Beck Anxiety Inventory (BAI): Beck Anxiety Inventory is a 21-item self-assessment inventory that is likert-type and that serves to determine the level of the anxiety signs of the individual. It was developed by Beck, *et al.* [18] in 1988. It was adapted into Turkish by Ulusoy, *et al.* in 1998 [19] and internal consistency coefficient was found as 0.93. The high score obtained from the inventory reflects a high level of anxiety. The anxiety levels according to the scores obtained from the inventory are grouped as “Low Level Anxiety” for 0-17 score, “Moderate Level Anxiety” for 18-24 score, and “High Level Anxiety” for 25 and over score [18,19].

Revised Illness Perception Questionnaire (IPQ-R): It was developed by Broadbent, *et al.* in 2006 [3]. The Revised Illness Perception Questionnaire was developed by creating the questions that best summarize the items in each subscale. The cronbach alpha coefficient of 9-item IPQ-R was found as 0,86 in the study of Kahyaoglu Süt [20]. Revised Illness Perception Questionnaire has been used in the studies conducted with the patients with chronic illness [20].

Ethical Principles

In order to be able to carry out the study, Ethics Committee approval and necessary approvals from the relevant institutions were received and also written consent was got from the patients

Data Evaluation

The study data were analyzed with SPSS 18.0 program. Mann Whitney U Test, Kruskal Wallis Test and Spearman Correlation Analysis were used in the evaluation of the differences between the groups. The results were evaluated at 95% confidence interval and significance level $p < 0.05$.

Results

The mean age of the participants is 61.27 ± 14.09 and 53.8% of the participants are male and most of them are married (84.3%) and primary school graduates (64.8%). While 41.1% of the participants undergo HD treatment in private dialysis centers, 58.9% of them

undergo HD treatment in the hospitals. While 97% of the participants undergo dialysis treatment four times or more a week, 3% of them undergo dialysis treatment once - three times a week (Table 1).

The mean score of the participants they obtained from MMAS-8 scale is 5.5 ± 1.92 . While the frequency of non-adherence to diet treatment for the last two weeks is 3.42 ± 3.9 days, the frequency of non-adherence to fluid restriction is 3.27 ± 3.8 days. It was determined that 36.4% of the participants were in full adherence to the diet treatment, 37.3% of them were to the fluid restriction, and 50.8% of them were to the drug treatment (Table 2)

It was found that the female patients were significantly better in adherence to diet ($p \leq 0.05$) and fluid restriction ($p \leq 0.05$) compared to the male patients. The patients who were informed about the illness and the treatment process were found to have better adherence to diet ($p \leq 0.05$) and fluid restriction ($p \leq 0.01$) than the patients who had not been informed. It was determined that the adherence of the participants to the diet differed significantly according to the institution from which they received the treatment, and the patients undergoing HD in the hospitals were better in adherence to diet ($p \leq 0.01$) and

Table 1. Characteristics of sample.

	$\bar{x} \pm SS$	
Age (Year)	61.27 ± 14.09	
	n	%
Gender		
Female	109	46.2
Male	127	53.8
Marital status		
Married	199	84.3
Single	37	15.7
Education		
Literate	48	20.4
Primary school	153	64.8
≥ High school	35	14.8
Treatment institution		
Special center	97	41.1
Hospital	139	58.9
Dialysis frequency per week		
1-3 times	7	3
≥ 4 times	229	97

Table 2. The compliance with therapeutic regimen in patients with CRF.

	$\bar{x} \pm SS$	
The 8-item Morisky Medication Adherence	5.5 ± 1.92	
Nonadherence Questionnaire with Dialysis Diet and Fluid Restrictions		
Nonadherence to diet	3.42 ± 3.9	
Nonadherence to Fluid Restrictions	3.27 ± 3.8	
	n	%
Nonadherence degree to diet		
Adherence	86	36.4
Mild	24	10.2
Moderate	91	38.6
Critical	17	7.2
Very critical	18	7.6
Nonadherence degree to fluid restrictions		
Adherence	88	37.3
Mild	38	16.1
Moderate	73	30.9
Critical	21	8.9
Very critical	16	6.8
Nonadherence degree to medications		
Adherence	120	50.8
Nonadherence	116	49.2

fluid restriction ($p \leq 0.05$) compared to the patients undergoing HD in the private dialysis centers. It was found that the patients having efficient communication with medical staff were better in adherence to diet ($p \leq 0.05$) and fluid restriction ($p \leq 0.05$) compared to the patients not having efficient communication with the medical staff. It was determined that the gender of the patients, the level of the information they had about the illness, the institutions from which they received the treatment and the level of communication they had with medical staff did not make a statistically significant difference in their adherence to the drug treatment (Table 3).

It was found that there was a negative relationship between the adherence of the participants to the treatment regimen and anxiety, depression levels and illness perception. It was determined that there was a positive relationship between diet, fluid restriction and the adherence to the drug treatment. It was found that there was a positive relationship between the adherence to the treatment regimen and the sub-dimensions of illness perception that are personal control

and understanding the disease, and it was also determined that the adherence to diet and fluid restriction was associated with duration and treatment benefit that are the sub-dimensions of illness perception, and a negative relationship was found between illness perception and anxiety, depression (Table 4).

Discussion

In the studies conducted in our country and in other countries, the adherence rate of the patients with CRF to diet and fluid restriction usually ranges from 20% to 88% (25-34). When the studies mentioned are examined, it is seen that the adherence levels of the patients to the diet and fluid restriction are very variable, but the patients show a low level of adherence in most of the studies [21,22]. The adherence levels of the patients participating in our study to diet (%36.4) and fluid restriction (%37.3) are low, and this finding supports the results of the other studies showing the adherence of the patients to diet and fluid restriction is at low level [7,21-23].

Table 3. Table 3: Some factors affecting the adherence of the patients to the treatment regimen and adherence to the treatment. ^a=Spearman correlation, ^b=Mann Whitney U Test, ^c=Kruskal Wallis test.

	Diet adherence		Fluid Restrictions adherence		Medication adherence	
Age ^a	r=0.008, p=0.90		r=0.078, p=0.23		r=0.078, p=0.234	
	Mean rank	p	Mean rank	p	Mean rank	p
Gender ^b						
Female	107.82	0.018*	106.45	0.009	124.50	0.20
Male	127.67		128.84		113.35	
Information about disease ^b						
Yes	114.70	0.010**	114.93	0.017	118.99	0.74
No	149.17		147.37		114.52	
Treatment institution ^c						
Private center	147.07	0.000**	146.04	0.000	119.01	0.91
University hospital	111.27		110.45		121.00	
Government hospital	90.24		91.96		116.27	
Communication with medical staff ^b						
Good	114.20	0.010*	113.44	0.003	120.32	0.29
Poor	145.94		150.77		106.89	

Table 4. Evaluation of the relationship between the factors affecting the adherence to the treatment by correlation analysis. * $P \leq 0.05$, ** $P \leq 0.01$

	Medication adherence	Fluid restrictions adherence	Diet adherence	Consequence	Timeline	Personal control	Treatment control	Symptom severity	Concern	Understanding	Emotional response	Illness perception	Anxiety	Depression	Illness time	Age
Medication adherence	1															
Fluid Restrictions	-.178**	1														
Diet adherence	-.238**	.830**	1													
Consequence	.119	.096	.127	1												
Timeline	-.055	.182**	.208**	.407**	1											
Personal control	.190**	-.191**	-.138*	-.025	-.077	1										
Treatment control	.069	-.330**	-.302**	-.015	-.341**	.465**	1									
Symptom severity	.195**	-.003	.034	.488**	.212**	.049	.090	1								
Concern	.191**	-.041	-.033	.472**	.194**	.157*	.148*	.563**	1							
Understanding	.148*	-.271**	-.279**	-.020	-.464**	.376**	.525**	-.015	.043	1						
Emotional response	-.023	.078	.081	-.109	-.039	-.022	-.062	-.076	-.109	-.058	1					
Illness perception	.249**	-.111	-.068	.569**	.185**	.472**	.471**	.629**	.677**	.358**	.152*	1				
Anxiety	-.240**	.037	.035	-.344**	-.232**	-.144*	-.094	-.495**	-.401**	-.086	.032	-.478**	1			
Depression	-.148*	.84**	.101	-.229**	.021	-.189**	-.217**	-.346**	-.314**	-.220**	-.073	-.432**	.552**	1		
Illness time	.048	-.010	.043	.014	-.045	.121	-.054	.077	-.007	.065	.011	.048	.004	-.068	1	
Age	.078	.078	.008	-.130*	-.046	-.098	.022	-.157*	-.160*	-.117	.013	-.164*	.109	.133*	-.144*	1

In other studies, and in our study, a remarkable finding is that the adherence of the patients to the drug treatment is at better level than the adherence to diet and fluid restriction [22,23]. According to the result of our study, it is seen that 50.8% of our patients regularly take their medicine and their adherence to drug treatment is better than their adherence to diet and fluid restriction. Adherence to diet and fluid restriction limits the lives of the individuals but taking medicine does not require any restriction. Thus, the adherence of our patients to the drug treatment is considered to be at better level compared to their adherence to diet and fluid restriction.

Another remarkable finding in our study is that when the characteristics related to the treatment are taken into account, the patients receiving treatment at the centers of the state and university hospitals show significantly more adherence to their diet and fluid restriction than the patients receiving treatment at the private dialysis center. The reason for less adherence of the patients receiving treatment at the private dialysis center to diet and fluid restriction compared to the patients receiving treatment in state and university hospitals may be related to the level of the communication of the patients with medical staff. 22.7% of the patients receiving treatment at the private dialysis center, 5.5% of the patients receiving treatment in the university hospital and 8.3% of the patients receiving treatment in the state hospital stated that they did not have efficient communication with the medical staff. It is seen that the participants having efficient communication with the medical staff are significantly different in showing adherence to diet and fluid restriction compared to the participants not having efficient communication with the medical staff.

In our study, women were found to show significantly more adherence to diet and fluid restriction than men. According to our study results, it is seen that gender is not a significant factor affecting the adherence to the drug treatment, but the adherence of the women to drug treatment is at better level than that of the men. Based on these findings, it can be said that female gender is a factor affecting the adherence to the treatment. It was reported in the studies of Chan, *et al.* [24] that male gender was a factor increasing the non-adherence to the treatment. Burner, *et al.* [25] determined in their article showing gender differences in the individual control of diabetes that women showed more adherence in choosing the right food for themselves than male patients. In the same study, it was stated that women had more knowledge and skills about preparing and cooking food than men. In our study, it is thought that women, due to their skills in preparing and cooking food, show more adherence to diet, fluid restriction and treatment regimen than men. At the same time, it is thought in our study that male patients have negative illness perception compared to women and therefore, they show more non-adherence to diet and fluid restriction.

It was stated in the studies that as the age increased, the adherence to the treatment increased [7,24]. In our study, it was determined that age was not a factor affecting the adherence to the treatment. The proportion of the patients participating in the study and aged 40-60 years (52.5%) and the proportion of the patients aged over 60 years (40.7%) are close to each other. The proportion of our patients participating in the study and under the age of 40 is very low, so the effect of the age on the adherence level may not be determined.

In some studies in the literature it is stated that having knowledge about diet and fluid restriction and being aware of restrictions are the factors that increase the adherence [8,27,26]. It is reported in different studies that the patients with CRF do not have enough knowledge

about diet and fluid intake, and they have problems with adherence to diet and fluid restriction (50-98.3%) [2,9,10,21]. It was determined in one of the studies that 79.5% of the hemodialysis patients being aware of the importance of fluid restriction adhered to fluid restriction, 62% of them had difficulty in adhering to fluid restriction, and 36% of the patients having adherence difficulty could not resist the desire to drink water, so they had difficulty in adhering to fluid restriction [8].

It is clear that the female patients with a chronic illness and having adequate knowledge of diet show more adherence to their diet [25]. Having information about diet and fluid restriction is a significant factor affecting the adherence of our patients to diet and fluid restriction. However, the level of adherence of the patients to diet and fluid restriction is not at the desired level. The reason for the non-adherence of our patients to diet and fluid restriction at the desired level may be related to their level of anxiety and depression (It was found that 66.5% of our patients had low, 14% had moderate and 19.5% had high level of anxiety, and also 26.7% had mild, 16.5% moderate and 18.6% had severe depression). Our correlation analysis result shows that depression is a factor affecting the adherence to fluid restriction and drug treatment. Depression and other psychological problems affect the adherence to the treatment negatively [7,28].

According to our results, it can be said that the level of depression is a factor increasing the non-adherence to fluid restriction and drug treatment. It is stated in the literature that stress and depressive feelings experienced by the patients with CRF and other chronic diseases affect the adherence to the treatment negatively [28,29]. As a treatment method, to depend on a hemodialysis device for a while, on medical staff and on a health centre may cause dependency and independency conflicts and therefore psychological problems in the patients undergoing HD particularly 3-4 days a week [11]. It was determined in our study that depression and anxiety level were the factors affecting the illness perception negatively. It is stated in the studies conducted on the patients with different chronic illnesses other than CRF in the literature that there is a negative relationship between the illness perceptions and depression levels of the patients and that the risk of depression is low in the individuals with a high level of understanding the disease and personal control perception [9-11]. Similar to the literature, it was determined in our study that as the level of depression increased, understanding the disease and personal control decreased.

Positive illness perception affects the adherence of the patients to the drug treatment, diet and fluid restriction positively [8]. According to our study result, it was determined that positive illness perception was not a factor affecting the level of adherence to diet and fluid restriction. Despite positive illness perception, the reason for the non-adherence to diet and fluid restriction can be explained by the duration of illness and education level. 39% of the patients participating in our study have been ill for 90 months and over. According to our study result, it can be said that the idea that the illness will last for a long time affects the adherence to diet and fluid restriction negatively. According to our correlation analysis result, it was determined that as the perception of illness duration increased, the non-adherence to diet and fluid restriction increased. Another reason why positive illness perception could not increase the level of adherence to diet and fluid restriction can be explained by education level. 14.8% of the patients who participated in our study have high school and higher degrees. It is thought that the fact that the individuals with high level of education have knowledge about disease and treatment, consider the recommendations of medical staff and understand the importance of treatment affects the adherence to the treatment positively. It was

determined in one study that the education levels of the patients were low and that this patient group did not understand what they were told, or they forgot it, or they could not turn them into practice, and therefore, as the training given to them did not produce an effect, the success in the adherence to the treatment could not be achieved [30].

Having knowledge about what the disease is, the increase in the comprehensibility of the disease affects the ability of the patients to have control over the disease and the adherence to the treatment. In other similar studies, it is stated that the patients who can not understand what the illness is are less successful in adherence to the treatment, and the perceptions of personal control and treatment benefit are low and their negative feelings intensify [4,9,11,12]. According to our study result, it is seen that the patients having full understanding of their illness (understanding / adherence), believing that they have control over the disease (personal control), having serious complaints related to the disease (symptom severity) and the patients whose anxieties increase due to the disease (worry) show more adherence to the drug treatment. The personal control perception and thinking that chronic illness can be controlled can help the treatment to be managed effectively and reduce the negative feelings associated with the disease. The belief that the individual has control over his / her illness affects the adherence to the treatment positively [3,4,9]. It is seen that the patients participating in our study have a high level of personal control and this has a positive effect on the treatment regimen. It was found that while there was a positive relationship between the personal control perception and the adherence to the drug treatment, there was a negative relationship between the personal control perception and the non-adherence to diet and fluid restriction. This finding supports the results of other studies showing that personal control affects the disease management positively [3,9].

The belief that patients need treatment, symptoms will decrease, and they will recover from illness has a positive role in the effective management and maintenance of the treatment. It has been stated in the study of Uysal and Akpınar [31] which they conducted on the patients with DM, a chronic illness, that diabetes control was gained only in 35.4% of the patients, more than half of the patients (64.5%) had low belief in the benefit of treatment, and the depression scores were high in the patients who cannot achieve treatment success. According to the results of our study, it was determined that the treatment benefit perception was high in our patients and as the treatment benefit perception increased, the adherence to diet and fluid restriction increased. It was determined in our study that the perception of understanding the illness and the perception of personal control of the patients who thought that they got benefit from the treatment were affected positively, and the level of anxiety and depression affected the perception of treatment benefit negatively. This finding is similar to the ones in the literature [4,32].

It was determined in our study that the perceptions of understanding of the disease, treatment benefit and personal control of the patients participating in our study were high, and that the perceptions of duration, outcome, anxiety and symptom severity of the patients were low, and that they perceived the emotional symptoms related to the illness moderately, and that according to our correlation analysis result, as the level of personal control, treatment benefit and understanding of the disease increased, the adherence to the drug treatment, diet and fluid restriction increased but this adherence was not at the desired level. These findings support the results of the study conducted by Broadbent, *et al.* [3] and showing that the adherence to the treatment was at better level in the patients whose personal control,

symptom severity and anxiety were high and who understood their disease.

The symptom severity, which is a symptom of the patients living with the disease, can decrease the adherence to the treatment. It is stated in the studies that the patients showing better adherence to the treatment have low level of symptom severity [3,9,32]. Similarly, it was found in our study that symptom severity score of the patients was low and there was a positive relationship between symptom severity and the adherence to the drug treatment [33].

Conclusion

Non adherence to diet and fluid restriction is highly prevalent among CRF Patients. The adherence of women, those having information about diet and fluid restriction and those having efficient communication with medical staff to the treatment diet are at good level. While positive perception of illness affects the adherence to treatment positively, anxiety and depression affect it negatively.

Conflict of interest

The authors comment no conflicts.

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