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Research Article

Quality of Life in Patients with Chronic Renal Failure and Some Affecting Factors

Abstract

Purpose: This study was conducted to determine the quality of life (QoL) in dialysis patients (DP) and the factors affecting the QoL.

Material and Methods: 104 DP patients receiving treatment at a university hospital were included in this research, which was also a cross-sectional study. Data were collected with the Patient Information Form (PIF) and Kidney Disease Quality of Life Form (KDQOL-36). Collected data were evaluated on SPSS.

Result: The most affected QoL dimensions in the sampling were disease burden based on kidney disease, physical health-12 and mental health-12, respectively. The QoL was found low in higher ages, women, people with low education level, people living with family and patients undergoing dialysis for a long time ($p< 0.05$), and mental health was low in single people. Moreover, mental health component scores were especially obtained low in people who didn't adherence their diet. In our study, the effect on quality of life was not found statistically important in terms of having a comorbid disease and taking erythropoietin ($p> 0.05$).

Conclusion: CRF led to an advanced increase in the disease burden of the patients and influenced the areas of physical and mental health negatively. In order to enhance the QoL in patients with CRF, it is necessary to improve the affected areas with a multidisciplinary approach and to handle the factors which influence the QoL with the understanding of effective and holistic health services in line with the individualized need for patient care.

Introduction

Chronic renal failure (CRF) is an important public health problem that has become an epidemic in Turkey [1,2]. CRF threatens the patient health with high rates of disability and death, and the health budget together with expensive dialysis and kidney transplant treatments seriously. Over 2 million people worldwide still maintain their lives with dialysis and kidney transplant treatments. It is estimated that approximately 10% of the adults have kidney disease in the world. This number is expected to double annually by 6-8 % in coming 10 years, and the total treatment cost may reach 1.5 trillion dollars. According to the data of the Turkish Nephrology Association, there are almost 60,000 patients who receive dialysis treatment or had kidney transplant. It is anticipated that this number will exceed 100,000 annually by 10% in 2015, which is almost twice of many developed countries, and the 1.5 billion dollar treatment cost will double [1-4].

Hemodialysis, which is one of the end-stage renal failure treatments, is a life-saving treatment for the patients [5-9]. However, important changes occur in lives of the patients who receive hemodialysis treatment despite the developments in this treatment model. Patients encounter many physical, spiritual and social problems [5-8]. Symptoms such as fatigue, cramp, pain, sleep disorder, dyspnea, piruritis, depression, nausea, vomiting and constipation negatively influence all the areas of daily living and the quality of life (QoL) of individuals [10-12]. Restrictions in social life and physical activity difficulties occur together with these symptoms that are frequently experienced by the hemodialysis patients. It was found that especially fatigue influenced working, spending free time, nutritional habits, sexual activities, enjoying life, family relations and friendships negatively [13,14] Some psycho-social difficulties like the deterioration of the working capacity, decrease in the physical activities, problems inside the family and sexual problems in dialysis patients complicate the maintenance of the treatment and influence the disease process and treatment negatively [15-17].

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Because the patients receiving regular hemodialysis treatment have to deal with the symptoms of the disease, continue a diet, adapt themselves to the changes in their bodies and review their personal, social and professional purposes once again, hemodialysis affects briefly all the areas of life including social, economic and psychological aspects and the QoL [7,13,17]. Patients might be under the effect of many psychological and physical factors and develop physical and psychological problems while getting used to the changes in their lives and learning to live with them. All these may affect the life qualities of the individuals negatively [18-22] Planning care attempts that will enable understanding the disease behavior in sick individuals, psychological reactions and adaptation difficulties and developing appropriate handling methods can be possible with QoL evaluations [20,22]. As in WHO's definition, QoL studies must occasionally be carried out for the holistic evaluation including physical, spiritual and mental dimensions of life [15-17,20]. Because QoL evaluations may give important clues for the development of the services offered, it is quite significant to evaluate the QoL of hemodialysis patients multidimensionally. Whereas quite many studies are encountered worldwide regarding the QoL of dialysis patients [7-9, 13], the number is limited in Turkey. Besides, it has been found that QoL studies in Turkey are assessed with SF-36 rather than a scale specific to kidney patients. Therefore, this study aims at investigating the QoL of CRF patients in Turkey and the factors affecting the QoL through KDQOL-36, which is a scale specific to kidney disease.

Method

Research sampling consisted of patients who underwent dialysis treatment with chronic renal failure diagnosis in the dialysis unit of a university hospital, complied with the criteria and accepted to participate in the study. The criteria applied in the sampling selection were being at and above the age of 18, having undergone dialysis treatment at least for six months, having no psychiatric diseases, open consciousness and cooperation. In compliance with these criteria, 104 patients were included in the study. Eight patients were excluded from the study because they were unwilling, two patients were not included due to conscious changes and four patients were excepted due to the fact that they had been diagnosed for less than six months.

Data collection tools

Patient Information Form (PIF): This form was prepared by researchers according to literature information and previous studies. A personal information form with 21 questions in total was used including the questions related to sociodemographic information such as patient age, gender, educational level, working status and marital status, questions about comorbid diseases, dialysis treatment, diet and taking erythropoietin.

Kidney Disease Quality of Life–Short Form (KDQOL-SF): The form which is mostly used in the ESKD, a scale specific to the disease, is the Kidney Disease Quality of Life Form. KDQOL was developed by Ron Hays et al. in the USA in 1994 [22] and translated into Spanish, Italian, German, Japanese, French, Chinese, Netherlandish (Dutch) and Turkish. This is a scale that helps monitoring the ESKD patients and in which its various treatment effects and well-being are declared and evaluated by the patient himself.

It has both a general section and a section specific to the kidney disease. As a general scale, it is based on SF-36, and as a specific scale, it includes questions targeting certain health problems of the individuals with kidney disease or ESKD patients that received renal replacement treatment; it is a self-applicable scale. The survey has 36 articles divided into 5 dimensions. SF-12 (12 articles); articles related to kidney disease (5 dimensions/24 articles): Symptom/problem list (12 articles), Effect of kidney disease (8 articles), Burden of kidney disease (4 articles), SF12 physical component (6 articles), SF12 mental component (6 articles). Likert method was used for each article during the scoring. A program is available on the website of the KDQOL study group which is used for calculating the score. Scores change between 0 and 100 at each dimension, and higher scores reflect the QoL QoLrelated to better health. Its Turkish translation was made by Yıldırım et al [23]. For the Turkish version of the scale, the Cronbach alpha value was found as 0.80.

Ethics considetation

The study was approved by the Ethics Commitee of the Cumhuriyet University Hospital in addition to the official permissions. The patients were informed that they would end their participation whenever they want, their private information will not be revealed or used in whatsoever form, and utmost confidentiality will be maintained.

Statistical analysis

SPSS (Statistical Package for Social Sciences) 14.0 statistics packaged software was used for statistical assessments in this research. For the sociodemographic, clinical and laboratory data of the patients, descriptive statistical methods were used. In the analyses including group comparisons, the Chi-square test was applied for categorical variables, the Mann Whitney U test for averages in 2-group comparisons and the Kruskal Wallis test in 3-group comparisons. Results were assessed at 95% confidence interval and the significance level was accepted as $p<0.05$.

Results

It was determined that 52.9% of the cases with a 63.05 (SD;12,92) average of age were men, 69.2% were married, 66.3% were primary school graduates, only 5.8% were university graduates, most of them didn't work (97.1%) and 70.2% had living with family. Moreover, 64.6% had another diagnosed chronic disease and people with chronic diseases mostly had diabetes and hypertension problems (95.0%). It was found that 93.3% of the cases underwent hemodialysis, 36.7% had dialysis application less than 1 year, 68.9% went through dialysis procedure 5 years or less, 70% of hemodialysis patients went into dialysis for 3 times 4 hours a week, 84.6% adhered to their diet as they stated and only 25% received erythropoietin treatment (Tables 1,2).

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It was also detected in the sampling that the disease burden based on kidney disease was the lowest (mean; 28.25, SD; 27.26), and the means of physical health-12 (mean: 30.87, SD: 9.58) and mental health-12 (mean: 37.99, SD: 9.62) were low, too (Table 3).

Considering the relationship between the sociodemographic attributes and QoL of the cases, age differences were found important in terms of symptoms ($p<0.01$), but unimportant in terms of disease duration, disease effect, SF12 physical component and SF-12 mental component ($P>0.05$). A negatively oriented ($r=-.13$) relationship was obtained between ages and symptoms. Even though this relationship coefficient is statistically important, it is weak as a relationship criterion. When QoL functions were compared as per gender, the difference between the genders was found unimportant in terms of disease burden ($p>0.05$), but important in terms of symptoms, disease effect, SF-12 physical component and SF-12 mental component ($p<0.05$). As seen, the score of women is lower than that of men at these parameters. When QoL table functions were compared as per educational level, the difference was found unimportant in terms of SF-12 physical component, SF-12 mental component and disease burden ($p>0.05$), but important in terms of symptoms and disease effect ($p<0.05$). Regarding the comparison of the scores in pairs as per the educational level, the difference between literates-primary school graduates, literates-high school graduates and literates-university graduates was found important ($p<0.05$), but the difference between the educational levels was unimportant ($p>0.05$). QoL of university graduates was found higher. When the QoL table functions were compared as per the marital status, QoL related to mental health was found higher in married people than the single ones ($p>0.05$). While the difference between patients' living alone or with family and disease burden component was found unimportant ($p>0.05$), it was considered important in terms of symptoms, disease effect, SF12 physical component and SF12 mental component ($p<0.05$). Symptom, disease effect, SF12 physical component and SF12 mental component scores were found higher in

Table 1: Some features of patients with chronic renal failure.

Features	
Age (mean±SD)	63.05±12.92
Sex n(%)	
female	49 (47.1)
male	55 (52.9)
Marital status	
married	72 (69.2)
single	32 (30.8)
Educational status	
literate	25 (24.0)
primary school	69 (66.3)
Secondary/high school	4 (3.8)
university	6 (5.8)
Employment status	
employed	3 (2.9)
unemployed	101 (97.1)
Whom lived	
Living with family	73 (70.2)
Living alone	31 (29.8)
Place of residence	
province	75 (72.1)
county	19 (18.3)
village	10 (9.6)
Comorbid disease	
yes	67 (64.6)
no	37 (35.6)
Name of comorbid disease	
Diabetes Mellitus	8 (11.9)
Hypertension	31 (46.3)
Diabetes Mellitus + Hypertension	23 (34.3)
Chronic obstructive pulmonary disease	5 (7.5)

Table 2: Clinical characteristics of the patients.

Clinical features	n (%)
Dialysis type	
SAPD	7(6.7)
Hemodialysis	97(93.3)
Duration of dialysis (years)	
<1 yr	33(36.7)
1-5 yr	29(32.2)
6-10 yr	15(16.7)
≥11 yr	13(14.4)
The frequency of dialysis	
3 days, 3 hours, per week	23(25.6)
3 days, 4 hours, per week	63(70.0)
2 days, 4 hours, per week	4(4.4)
Education status related to dialysis	
yes	57(54.8)
no	47(45.2)
Adherence to diet	
yes	88(84.6)
no	16(15.4)
Erythropoietin use	
yes	26(25.0)
no	78(75.0)

Table 3: Descriptive statistics of KDQOL-36 in chronic renal failure patients.

KDQOL-36	Mean	Median	Stan. Dev.	Min-Max
Symptom/problem	66.52	68.75	19.21	0-100
Effects of kidney disease	58.20	59.38	20.47	0-100
Burden of kidney disease	28.25	25.00	27.26	0-100
SF-12 Physical Health Composite	30.87	29.31	9.58	0-100
SF-12 Mental Health Composite	37.99	36.76	9.62	0-100

KDQOL-36: Kidney Disease Quality of Life–Short Form.

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people living with their families than the ones living alone. When the subdimensions of the QoL scale were compared with respect to the existence of another diagnosed chronic disease, the difference was found unimportant in terms of all the components (p>0.05). Although the disease burden subdimension score from the QoL subdimensions of the patients with hypertension and diabetes besides chronic renal failure was very low (mean±SD; 18.75±21.97), the difference between the groups wasn't found statistically important. Likewise, the difference between the groups wasn't found important and it shows that the coexistence of CRF and COPD in COPD patients leads to higher perception of the disease burden (mean±SD; 12.50±17.67) (Table 4).

As found, the more the dialysis treatment duration increased, the more the QoL scores decreased at all the dimensions. When the QoL subdimensions were compared as per the dialysis treatment duration, the statistical difference was found important in terms of all the other components except for the symptom subdimension (p<0.05). When the QoL subdimensions of the patients were compared as per the dialysis treatment frequency, the difference was found important in terms of symptoms and disease burden (p<0.05), but statistically unimportant in terms of disease effect, SF-12 physical component and SF-12 mental component (p>0.05). QoL score was found higher in people whose dialysis frequency was between 3 days 4 hours. It was determined that the scores were higher in all the subdimensions of QoL in people who adhered to their diet and the statistical difference was important in terms of SF-12 mental component (p<0.05). When the QoL table functions were compared as per erythropoietin application status, the difference was found statistically unimportant in terms of all the components (p>0.05) (Table 5).

Table 4: Effect on quality of life of some characteristics of the patients with chronic renal failure.

Characteristics	Symptom	Effects of kidney disease	Burden of kidney disease	SF-12 PHC Companent	SF-12 MHC Component
	$\bar{x} \pm s$	$\bar{x} \pm s$	$\bar{x} \pm s$	$\bar{x} \pm s$	$\bar{x} \pm s$
Gender			v		
female	58.58±17.28	53.51±20.22	25.12±24.66	27.16±5.42	35.69±10.22
male	73.57±18.19	62.38±19.94	31.02±29.33	34.17±11.19	20.13±8.63
Statistical tests	t=4.29p=0.001*	t=2.25p=0.027*	t=1.10p=0.273	t=3.98 p=0.001*	t=2.34p=0.021*
Educational status					
literate	52.53±20.39	52.62±18.87	24.75±24.30	26.48±5.79	35.42±10.48
Primary school	69.80±17.12	60.69±19.93	28.44±28.22	31.96±9.65	38.62±9.04
Secondary/high school	78.31±7.88	36.72±22.73	28.12±26.26	31.54±8.68	41.85±8.69
University	79.10±2.481	67.19±22.42	40.62±31.31	36.16±16.44	38.79±13.00
Statistical tests	KW=17.23 p=0,01*	KW=8.25 p=0.41*	KW=1.36 p=0.715	KW=6.81 p=0.078	KW=4.26 p=0.235
Marital status					
married	68.16±19.12	57.46±20.85	26.99±27.29	31.42±9.36	39.64±9.40
single	62.81±19.20	59.86±19.79	31.05±27.42	29.61±10.80	34.26±9.17
Statistical tests	t=1.31p=0.192	t=0.55p=0.584	t=0.68p=0.486	t=0.88p=0.376	t=0.71p=0.008
Whom lived					
Living with family	70.14±18.58	61.21±20.24	30.65±27.97	32.23±10.59	39.89±9.54
Living alone	57.96±18.18	51.11±19.52	22.58±25.03	27.66±5.53	33.49±8.33
Statistical tests	t=3.07 p=0.003*	t=2.35 p=0.021*	t=1.38 p=0.168	t=2.27 p=0.025*	t=3.24 p=0.002*
Comorbid diseases					
yes	65.48±17.44	59.84±18.94	24.53±26.63	30.58±8.24	37.08±9.64
no	68.38±22.20	55.23±22.95	34.96±27.45	31.39±11.72	38.08±9.70
Statistical tests	t=0.73p=0.463	t=1.09p=0.274	t=1.89p=0.061	t=0.41p=0.683	t=0.07p=0.940
Name of comorbid diseases					
Diabet	66.40±19.55	53.90±18.20	31.25±25.87	34.52±9.07	36.38±8.22
Hypertansiyon	68.20±17.18	63.81±19.00	27.01±27.49	31.86±9.78	40.16±11.12
HT+DM	82.29±13.25	55.16±19.27	18.75±21.97	27.58±5.11	35.18±8.10
COPD	82.29±13.25	57.81±15.46	12.50±17.67	30.97±2.20	40.46±1.38
Statistical tests	KW=1.68 p=0.640	KW=3.69 p=0.296	KW=2.33 p=0.506	KW=5.47 p=0.140	KW=3.21 p=0.360

PHC: Physical Health Component, MHC:Mental Health Component.

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Discussion

Individuals have lifelong difficulties during chronic diseases like End-Stage Renal Failure. Patients go through many invasive procedures and medication in long-term treatments [6,8,10]. A big part of these patients experience restrictions in their social life and physical activity difficulties together with pain, fatigue and depressive symptoms caused by the disease. Patients become dependent on the machine, the institution applying dialysis and health personnel. This situation causes the patients to lose their independence. Obligation exists for receiving treatment through the dialysis machine in the institution on certain days of the week and in specific hours [12,17]. This dependence leads to troubles in family, professional and social lives of the patients. These problems influence the QoL of the patients negatively [13,15]. The quality of life is a significant criterion for the evaluation of quality of life, treatment consequences and level of living [16,18,20]. With this understanding, our study aims at researching the quality of life in the patients who have chronic renal failure and dialysis treatment in our university hospital and factors affecting it.

Subscale scores of QoL scale that belong to the cases were generally found low in our study. In the sampling, mostly the disease burden based on kidney disease, physical health and mental health were influenced respectively. It was detected in many studies investigating the QoL of the patients with ESRF that QoL was perceived medium and below medium/low in parallel with our result [24,25]. Patients felt mostly the disease burden of kidney disease in this sampling. Disease burden has been determined as the factor decreasing the QoL of the patients mostly. QoL scores related to physical and mental health were also found low.

When the relationship between the sociodemographic attributes and QoL of the patients with CRF is reviewed, age increase in CRF is generally associated with bad results in QoL researches regarding health [18,26-28]. A negatively oriented relationship was found between ages and symptoms in this study. This result, which was obtained from our study, shows consistency with the previous research results [29-31]. Mollaoğlu [30], revealed that the fatigue level rose with the increasing age and there was a significant difference between the age groups and fatigue. It is supposed that the increase in fatigue resulting from the rising age of the hemodialysis patients and the physiological changes that occur with aging may cause this situation and it may also result from the

Table 5: Effect on quality of life of clinical characteristics of the patients with chronic renal failure.

Characteristics	Symptom	Effects of kidney disease	Burden of kidney disease	*SF-12 PHC Companent	**SF-12 MHC Component
	$\bar{X} \pm s$	$\bar{X} \pm s$	$\bar{X} \pm s$	$\bar{X} \pm s$	$\bar{X} \pm s$
Duration of dialysis (yrs)					
<1 yr	61.61±20.78	55.36±19.43	17.80±18.29	26.34±5.45	34.49±6.04
1-5 yrs	75.64±16.10	66.27±20.44	41.59±31.26	36.06±10.00	44.21±9.89
6-10 yrs	70.13±13.72	60.41±15.38	28.33±30.14	33.02±10.38	38.08±9.12
≥11 yrs	63.22±15.32	58.89±13.24	19.71±16.99	30.80±10.64	35.03±11.07
Statistical tests	KW=9.37 p=0,640	KW=8.73p=0.033*	KW=11.02 p=0,012*	KW=18.73p=0.001*	KW=15.31 p=0,002*
Dialysis frequency (weekly)					
3 days, 3 hours	59.05±20.89	60.59±14.34	13.58±17.13	27.33±4.97	37.00±7.48
3 days, 4 hours week	71.36±16.15	58.63±20.37	31.94±27.81	32.63±10.17	38.50±10.40
2 days, 4 hours	63.02±22.13	58.59±25.18	37.50±33.46	31.67±15.39	42.52±8.32
Statistical tests	KW=6.54 p=0,038*	KW=0.91 p=0,956	KW=9.10 p=0,011*	KW=4.34 p:0.11	KW=1.05 p=0.590
Education related to dialysis					
yes	67.02±20.94	55.15±20.45	21.82±24.23	30.22±8.71	37.25±7.41
no	65.89±17.08	61.90±20.09	36.03±28.91	31.65±10.58	38.87±11.77
Statistical tests	t=0.29p=0.766	t=1.68 p=0.94	t=2,72p=0,008*	t=0.75p=0.45	t=0.85p=0.395
Adherence to diet					
yes	66.79±19.25	58.80±21.16	28.76±27.24	30.99±9.31	38.87±9.65
no	64.96±19.54	54.88±16.33	25.39±28.08	30.19±11.23	33.14±8.09
Statistical tests	t=0.35,p=0.727	t=0.70 p=0.483	t=0.45p=0.651	t =0.30 p=0.76	t=2.23 p=0.028*
Erythropoietin use					
yes	67.63±21.66	64.42±16.08	34.61±31.23	32.96±10.75	38.80±9.63
no	66.14±18.46	56.13±21.42	26.12±25.67	30.17±9.12	37,71±9.66
Statistical tests	t=0.34p=0.733	t=1.80 p=0.073	t=1.38p=0.170	t=1.29p=0.199	t=0.49p=0.619

PHC: Physical Health Component, MHC:Mental Health Component.

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increase in the number of chronic diseases with aging and the psychosocial effects of these diseases Hence, the existence of other chronic diseases other than CRF is also observed in most of our sampling.

Generally, female patients exhibit a worse QoL in the studies [18,22,28]. The score of women is lower than that of men in this study as well. Our study finding is similar to some research results [31-33]. All the subgroup score means of men in this study except for the disease burden of QoL scale were found higher than those of women. This finding draws attention to the need for supporting the women, who have more roles and responsibilities at home, in terms of physical and social aspects.

In our study, mental health status of the married patients was found higher than that of single patients. It was similarly reported in studies made on the hemodialysis patients that the general functional performance status and many dimensions were influenced more negatively in married patients compared to the single ones [18,27,28]. The reason behind the fact that married people have better mental health than the single people is attributed to the stronger social support, as determined in some studies [18,28]. Thus, the lower QoL including the mental health in people living alone supports this result in the study.

It was identified in our study that symptom and disease effect was perceived more negatively in people with lower educational level and this decreased the quality of life. The QoL was generally found to increase in parallel with the increase in the educational status. This result supports the literature [18,27-31]. The rise in the QoL scores together with the increase in educational level was an expected finding and it is thought that the health perception will change and develop positively, individuals will take more responsibilities related to health, in this sense, they will learn and use management strategies for their diseases or disease symptoms, and as a result, the QoL will enhance as the educational level increases.

In our study, quality of life in individuals living with their families were found higher than those living alone. It was set forth in the research made by Parkerson and Gutman [34], that social support perception and life qualities of the patients living with their families were higher. Zhang and Liu [35], revealed in their study that the QoL enhanced as the family support increased. Social support is very important in chronic diseases. It is generally anticipated that people living with their families will have more psychological support and their QoL will be higher due to sharing the family roles [34-37].

The great majority of the patients have an additional chronic disease. The additional chronic disease mostly found in our patients is hypertension; diabetes is ranked as the second disease together with hypertension. Hypertension prevalence of the individuals with CKD was determined as 56.3% and diabetes prevalence as 26.6% in the CREDIT study that determined the CKD prevalence in our country and was conducted by Süleymanlar et al. [4]. It was also stated that the prevalence of cardiovascular risk factors also increased in individuals who were at the advanced stage of the disease. On the other side, the effects of the comorbid diseases on QoL were found unimportant in terms of all the components in our study. However, it is notified that the increasing chronic diseases determine the personal insufficiencies and dependency in living activities and decrease the QoL [31,38,39]. The fact that the existence of comorbid diseases didn't influence the quality of life was evaluated as an interesting result in our study. It is important to investigate this parameter with other researches.

In our study, a decrease was detected in the QoL as the dialysis duration increased, which would be significant in every area. Patients who had started to receive dialysis treatment recently and undergone it for a long time felt the disease burden a lot and this situation is seen as an important factor decreasing their QoL. QoL may have been found lower in patients who received dialysis treatment between 6 months and 1 year because they couldn't adapt themselves to the dialysis procedure yet. It is supposed for the cases with longer dialysis duration that reasons such as negative feelings caused by dependency on a machine and other people on certain days due to both transportation and hemodialysis treatment, monotonous living, feeling that their situation is going worse, feeling of nonrecovery, fear of death, feeling tired and fed-up and insufficiency in dealing with the dialysis symptoms influence the decrease in the life qualities of patients [17,38,39].

When the QoL subscales were compared as per the dialysis session frequency in our study, the difference was found important in terms of symptoms and disease burden. QoL score is higher in patients who received dialysis treatment 3 days 4 hours a week. When short-term daily hemodialysis, night, long hemodialysis (5-6 times/week) and conventional hemodialysis (3 times/week) were compared in a study, QoL scales improved in parallel with the improvement in fluid, blood pressure and mineral metabolism control of the patients to whom dialysis methods were applied frequently. This study supports our results [17,38].

The quality of life in the patients with CRF that adhered to their diet was found high in our study. QoL of the patients that adhered to their diet was found high in previous studies as well [22,31,24]. In patients following their diet, metabolic control (urea, uric acid, creatine etc.) is provided in a better way, incidence of disease/dialysis complications based on gaining excessive weight decreases, and accordingly, the quality of life is affected positively.

When the QoL subscales were compared as per the erythropoietin application in our study, scores were found higher in terms of all the components compared to those who didn't take it, but the statistical difference is unimportant. In the literature, QoL of the cases that took erythropoietin was found significantly high in every area [40-43]. It is imagined that the limited number of the patients who took erythropoietin may have influenced the result in the study.

In conclusion, CRF led to an advanced increase in the disease burden of the patients and influenced the areas of physical and mental health negatively. In order to enhance the QoL in patients with CRF, it is necessary to improve the affected areas

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with a multidisciplinary approach and to handle the factors which influence the QoL with the understanding of effective and holistic health services in line with the individualized need for patient care.

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