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# Comparison of Quality of Life of Dialysis Treatments: The Case of Ankara Province

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## ABSTRACT

In this cross-sectional study, the quality of life of the patients who received Central Hemodialysis (CH), Home Hemodialysis (HH), and Peritoneal Dialysis (PD) treatments, which are the RRT methods applied in ESRD in Türkiye, is compared. This study aimed to offer suggestions for disseminating the application of the treatment method that provides life comfort. The Kidney Disease Quality of Life scale KDQOL 36 was applied to patients in Ankara diagnosed with ESRD and receiving central hemodialysis, home hemodialysis, and peritoneal dialysis treatments. The scale was applied by face-to-face interview method between 10.02.2022 and 01.05.2022. A simple random sampling method was used to determine the sample size, and all patients (n:574) with the sample size selected within the scope of the study were reached. In the evaluation of statistical tests, the level of significance was taken as  $\alpha$  0,05. It was observed that the mean quality of life of the physical and mental health components, which indicates the general quality of life of the patients, was below the average level with the values of  $37.7 \pm 9.8$  and  $42.4 \pm 9.3$ , respectively. The mean of the effects of kidney disease in the sub-dimension was  $58.9 \pm 24.5$ ; The mean of the symptom list sub-dimension of kidney disease was  $66.0 \pm 21.9$ . When the mean values of the sub-dimensions of the scale are evaluated as a whole, it is

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considered that the quality of life of the patients receiving dialysis treatment is low. Since home hemodialysis is superior to other types of dialysis in all sub-dimension mean scores of the scale, it is recommended that the Social Security Institution make encouraging regulations in the Health Implementation Communiqué to disseminate this practice.

**Keywords:** Chronic Kidney Failure, Dialysis, Quality of Life

## INTRODUCTION

Chronic renal failure is a nephrological syndrome resulting in chronic, progressive, and irreversible kidney loss for various reasons (Süleymanlar, 2010). Although it is mostly preventable, or at least its progression can be significantly delayed when detected early, the low awareness level and early diagnosis do not allow this in many cases (THSK, 2014). For patients in the end-stage of renal disease (ESRD), a stage at which they could continue their lives, kidney transplantation or dialysis treatments, which are expressed as renal replacement therapy (RRT), should be applied (Acar, 2016). The ideal treatment for ESRD is kidney transplantation, in which all kidney functions are restored. However, due to the limitations of transplantation, most patients have to continue their lives with dialysis (USRDS, 2019). Hemodialysis is the process of reintroducing the blood taken from the patient to the patient by clearing the liquid and solute content by means of a semi-permeable membrane and a hemodialysis machine (Serdengeçti, 2009). Home hemodialysis (HD) is a hemodialysis treatment administered by the patient or their assistant in the patient's own home (San, 2009). Peritoneal dialysis (PD) is a treatment method that mimics some normal kidney functions. It got this name from the peritoneum (Peker, 2007).

Although quality of life is frequently discussed in various fields of expertise, especially in economics, social sciences, and medicine, there is no universal definition. Although the expressions used in different areas while defining the quality of life vary, according to the definition of the World Health Organization Quality of Life Group, the satisfaction level of the person's expectations from life, goals, and the level of sufficiency in providing the standards they have determined for themselves within the framework of the value system they live in means the quality of life (Kantarıcı, 2017). Health-Related Quality of Life, on the other hand, came to the fore with the understanding that comes

from the World Health Organization's definition of health as "a state of complete physical, mental, and social well-being." This understanding has caused the concept of health to evolve from a limited biomedical model to a large-scale biopsychosocial model (Edisan & Kadioğlu, 2011).

Many quality-of-life scales have been used in studies of ESRD, and the most widely used is the Kidney Disease Quality of Life Form (KDQOL), one of the disease-specific scales developed by Ron Hays et al. in the USA in 1994. KDQOL is a scale used to monitor patients with ESRD and the effects of treatment and is evaluated by self-reporting of the patient's well-being. KDQOL also allows for detailed monitoring of clinical pictures as a result of treatment by comparing different RRT methods (Cohen et al., 2019). The study is the first in which patients' quality of life in end-stage renal disease (ESRD), the stage in which patients received central hemodialysis (CH), ED, and PD treatments with RRT methods, was compared.

Peritoneal dialysis and central hemodialysis comparisons of the KDQOL 36 Kidney Disease Quality of Life Scale are frequently encountered in the literature, and the comparison of three dialysis types was made with this study for the first time since home hemodialysis practice has become widespread recently.

Within the scope of this study, analyses were carried out based on the following hypotheses.

Hypothesis 1: There is a statistically significant relationship between the sub-dimensions of the KDQOL-36 scale.

Hypothesis 2: There is a difference between the mean scores of the sub-dimensions (a. Symptom List of Kidney Disease, b. Effects of Kidney Disease, c. Burden of Kidney Disease, d. Physical Health Component, e. Mental Health Component) according to the type of dialysis.

## **MATERIALS AND METHODS**

### **Purpose of the study**

In this cross-sectional study, the quality of life of patients who received central hemodialysis (CD), HD, and PD treatments, which are the RRT methods applied in ESRD in Turkey, was compared. In light of the results obtained, suggestions were made to expand the application of the treatment method that provides the most life comfort to the patients intended.

With this cross-sectional study, it is aimed to compare the quality of life of patients who received central hemodialysis (MH), ED, and PD treatments, which are among the RRT methods applied in ESRD.

When the distribution of patients by dialysis type is examined, 59% of the patients are treated with CD, while 33% are treated with HD and 8% with PD. The socio-demographic characteristics of the patients are presented in Table 1.

**Table 1.** Distribution of Patients by Socio-Demographic Characteristics (n=574)

Socio-Demographic Characteristics	Category	n	%
<b>Gender</b>	Female	282	49,1
	Male	292	50,9
<b>Dialysis Time</b>	1-5 year	282	49,1
	6-10 year	163	28,4
	11-15 year	67	11,7
	16-20 year	59	10,3
	20 + year	3	0,5
<b>Marital status</b>	Married	432	75,3
	Other	70	12,2
	Single	72	12,5
<b>Educational Status</b>	Illiterate	57	9,9
	Primary school	187	32,6
	Middle School	99	17,2
	High school	134	23,3
	University	97	16,9
<b>Income rate</b>	Less Than Minimum Wage	167	29,1
	Equal to Minimum Wage	243	42,3
	More Than Minimum Wage	164	28,6
<b>Age Groups</b>	20-44	136	23,7
	45-64	256	44,6
	65-74	114	19,9
	75+	68	11,8

When the distribution of the patients according to dialysis durations is examined, it is seen that approximately 49.1% of them are dialyzed for 1–5 years, 28.4% for 6–10 years, 11.7% for 11–15 years, and 10.3% for 16 years. It is seen that they received dialysis treatment for 20 years. Three patients with kidney disease dialyzed for 20 years or more (Table 1).

When the patients' marital status is examined, it is seen that 75.3% of them are married. In the distribution of the number of patients by education, 32.6% were primary school graduates, 23.3% were high school graduates, 17.2% were secondary school graduates, 16.9% were university graduates, and 9.9% were illiterate. It appears not to be.(?) Considering the distribution of the patients in the study according to their income levels, it is seen that the income of 42.3% is equal to the minimum wage, 29.1% is less than the minimum wage, and 28.6% is more than the minimum wage (Table 2).

The relationship between the scores of the sub-dimensions of the KDQOL-36 scale is presented in Table 2, and the relationship between all the sub-dimensions of the scale was found to be statistically significant. There is a positive, linear, and strong relationship between the size of the Symptom List of Kidney Disease and the Impact of Kidney Disease size. Among other sub-dimensions, it is positive, linear, and moderate.

**Table 2.** The Relationship Between the Sub-Dimensions of the KDQOL-36 Scale (n=574)

		Kidney Disease Symptom List	Kidney Disease Effect	Kidney Disease Burden	Physical Health Component	Mental Health Component
<b>Kidney Disease Symptom List</b>	Pearson KK	1	,758**	,446**	,550**	,436**
	p value		,000	,000	,000	,000
<b>Kidney Disease Effect</b>	Pearson KK	,758**	1	,559**	,553**	,460**
	p value	,000		,000	,000	,000
<b>Kidney Disease Burden</b>	Pearson KK	,446**	,559**	1	,580**	,472**
	p value	,000	,000		,000	,000
<b>Physical Health Component</b>	Pearson KK	,550**	,553**	,580**	1	,312**
	p value	,000	,000	,000		,000
<b>Mental Health Component</b>	Pearson KK	,436**	,460**	,472**	,312**	1
	p value	,000	,000	,000	,000	

\*\* The Pearson KK is significant at the 0.05 level.

A comparison of the mean scores of the KDQOL-36 Scale Sub-Dimensions by Dialysis Type was made, and the mean values are presented in Table 3.

**Table 3.** Distribution of Patients' KDQOL-36 Sub-Dimensional Scores by Dialysis Type

	MH (n=341)			EH (n=45)			PD (n=188)		
	Ort.	Med.	Std. Sapma	Ort.	Med.	Std. Sapma	Ort.	Med.	Std. Sapma
<b>Kidney Disease Symptom List</b>	62,378	62,5	20,939	80,324	83,333	16,377	69,271	70,833	23,024
<b>Kidney Disease Effect</b>	54,426	56,25	24,077	68,919	68,75	20,728	64,706	65,625	24,405
<b>Kidney Disease Burden</b>	34,238	31,25	24,18	48,194	43,75	27,748	47,374	46,875	23,897
<b>Physical Health Component</b>	35,287	34,716	9,0802	45,229	48,015	10,732	40,16	40,25	9,462
<b>Mental Health Component</b>	40,968	39,864	8,9401	46,433	47,474	9,4612	43,957	44,368	9,4276

Whether the distribution of scores of the patients according to the type of dialysis in the subscales was normal or not was determined by the Kolmogorov-Smirnov test. The test results are presented in Table 4. It is seen that the distribution of each subscale according to the type of dialysis is not normal ( $p < 0.05$ ).

**Table 4.** Distribution of Patients' KDQOL-36 Sub-Dimension Scores by Dialysis Type Normality Test

Hemodialysis Group		Kolmogorov-Smirnov <sup>a</sup>	
		Statistics	p value
Kidney Disease Symptom List	CH	0,07	0
	HH	0,128	0,06
	PD	0,119	0
Kidney Disease Effect	CH	0,051	0,035
	HH	0,1	,200 <sup>*</sup>
	PD	0,131	0
Kidney Disease Burden	CH	0,127	0
	HH	0,141	0,024
	PD	0,095	0
Physical Health Component	CH	0,037	,200 <sup>*</sup>
	HH	0,144	0,021
	PD	0,057	,200 <sup>*</sup>
Mental Health Component	CH	0,061	0,004
	HH	0,068	,200 <sup>*</sup>
	PD	0,059	,200 <sup>*</sup>

The test of whether there is a significant difference between the mean scores of the KDQOL-36 scale sub-dimensions of the patients among the dialysis types is presented in Table 5. According to the results of the Kruskal-Wallis analysis of variance, it is said that the change in the mean scores of all sub-dimensions according to the type of dialysis is statistically significant ( $p < 0.01$ ).

**Table 5.** Kruskal Wallis Analysis of Variance

	Kidney Disease Symptom List	Kidney Disease Effect	Kidney Disease Burden	Physical Health Component	Mental Health Component
Mean	66,042	58,929	39,634	37,662	42,375
Chi-Square	34,926	29,149	44,582	52,421	22,935
p-value	,000	,000	,000	,000	,000

The results of which dialysis types differ in each sub-dimension were investigated with the Mann-Whitney U test. Paired comparison results with the Mann-Whitney U test are given in Table 6. It was concluded that the differences between the mean scores of all sub-dimensions were statistically significant

( $p < 0.0016$ ), and the difference between the mean scores of all sub-dimensions of the patients treated with ED and PD was not significant ( $p > 0.0016$ ).

**Table 6.** Types of Dialysis (Pairwise Comparison) Mean Subscale Scores Difference Test

		Kidney Disease Symptom List	Kidney Disease Effect	Kidney Disease Burden	Physical Health Component	Mental Health Component
CH ve HH	Mean	64,470	56,116	35,865	36,446	41,605
	Mann-Whitney U	3850,500	4880,500	5384,000	3721,500	4976,500
	p value	,000	,000	,001	,000	,000
CH ve PD	Mean	64,828	58,080	38,906	37,019	42,030
	Mann-Whitney U	26037,000	24592,000	21376,500	22872,500	26026,500
	p value	,000	,000	,000	,000	,000
HD ve PD	Mean	71,406	65,520	47,532	41,139	44,435
	Mann-Whitney U	3077,500	3823,000	4179,000	2978,000	3526,000
	p value	,005	,316	,900	,002	,083

## DISCUSSIONS

The quality of life of kidney patients in the ESRD stage who receive dialysis treatment was evaluated with five main sub-dimensions: physical and mental components, symptoms of kidney disease, effects, and burden of kidney disease. As a result of the evaluation, it was seen that the lowest averages were in the physical health component dimension ( $37.7 \pm 9.8$ ) and the burden of kidney disease dimension ( $39.6 \pm 25.2$ ), respectively. These averages are well below the intermediate level. It was observed that the mean quality of life of the physical and mental health components, which indicate the general quality of life of the patients, was below the average level with values of  $37.7 \pm 9.8$  and  $42.4 \pm 9.3$ , respectively. The mean of the effects of kidney disease in the sub-dimension was  $58.9 \pm 24.5$ . The mean of the symptom list sub-dimension of kidney disease was  $66.0 \pm 21.9$ . When the mean values of the sub-dimensions are evaluated as



a whole, it is considered that the quality of life of the patients diagnosed with ESRD who receive dialysis treatment is low. In the study of Cohen et al. (2019), which shows similar results, the mean burden of the kidney disease sub-dimension to patients was  $51.3 \pm 29.8$ ; the effects of kidney disease sub-dimension mean were  $73.0 \pm 22.7$ ; the mean of symptoms and problems of kidney disease sub-dimension was  $78.1 \pm 16.7$ ; the mean of the physical health component sub-dimension was  $36.6 \pm 12.2$ ; and the mean of the sub-dimension of the mental health component was  $49.0 \pm 13.4$ . In the study of Fukuhura et al. (2003), the mean burden of the kidney disease sub-dimension of patients was 28.6; the effects of the kidney disease sub-dimension mean were 67.7; the mean sub-dimension of symptoms and problems of kidney disease was 75.8; the mean of the physical health component sub-dimension was 60.9; and the mean of the sub-dimension of the mental health component was determined as 81.7. Nisel et al. (2016), who showed different results with this study, found the lowest quality of life sub-dimension as the burden of kidney disease, with an average of 41.31 in their study in Turkey. When the averages of the other sub-dimensions are examined, the effects of kidney disease are 69.28; the mean of the symptoms and problems sub-dimension is 79.59. Kring et al. (2009) used the mean quality of life as 40.80 for the burden of kidney disease, 62.50 for effect size, and 71.10 for symptom and problem list dimension; they found 75.90 for the physical health component and 77.20 for the mental life component. It is seen that there are many studies in the literature to evaluate the quality of life of patients diagnosed with ESRD and undergoing dialysis treatment. In these studies, it is seen that there is no consensus on the superiority of dialysis treatment types over each other in terms of their effects on quality of life.

### CONCLUSIONS

As a result of this study, when the mean values of the sub-dimensions of the scale are evaluated as a whole, it is considered that the quality of life of the patients diagnosed with ESRD and receiving dialysis treatment is low. The difference between the mean scores of all sub-dimensions of patients treated with MD and PD was statistically significant. It was concluded that the difference between the mean scores in all sub-dimensions of the patients treated with ED and PD was not significant ( $p > 0.0016$ ). In the studies in the literature, there is no certainty about the superiority of dialysis treatments over each other. How-

ever, since it was seen in the study that ED outperformed other dialysis types in all sub-dimension mean scores of the scale, it is recommended to expand this type of dialysis. It is recommended that the Social Security Institution make encouraging regulations in the Health Implementation Communiqué to disseminate this practice.

**Ethical Approval:** This study was initiated after obtaining ethics committee approval from Ankara University's Health Sciences Ethics Committee with a decision dated 16.07.2018 and numbered 160.

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