Original Article

The Effects of Malnutrition and Fluid Management on Quality of Life in Hemodialysis Patients

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Abstract

The aim of this study was to reveal the effect of malnutrition and fluid control on quality of life in hemodialysis patients.This descriptive study was conducted at hemodialysis units of two state hospitals in Eskişehir between June, 2018 and August, 2018. The study population included patients undergoing hemodialysis treatment (N = 150) while study sample included patients who accepted to participate in the study (N=122). Individual Data Sheet, Mini Nutrition Assessment (MNA), Fluid Control in Hemodialysis Patients Scale (FCHPS) and EQ5D General Quality of Life Scale were used in the study. The mean age was 61.42 ± 13.91 years in patients included to the study.

It was found that FCHPS score was 54.69 ± 7.95 and MNA score was 9.77 ± 2.08 while EQ-5D General Quality of Life Index score was 0.59 ± 0.30 and VAS score was 50.16 ± 21.70 in the patients. It was found that there was a weak positive correlation between the Mini Nutrition Test Score and the Quality of Life Visual Analog Scale score (VAS) and the index score while a strong positive correlation between the Quality of Life VAS score and the index score.

It was found that the patients had knowledge, attitude and behavior regarding fluid control on average but quality of life was moderate in the patients. It was observed that quality of life was improved by improving nutritional status.

Keywords: Hemodialysis, fluid control, malnutrition, quality of life

Introduction

Chronic renal failure (CRF) is defined as the inability of the kidney to regulate fluid-solute balance due to reduction in glomerular filtration rate through loss of renal functions and chronic impairment in metabolic and endocrine functions (Tanriverdi, 2010). The chronic renal failure that may affect patients from all ages is a serious disease that can reduce life expectancy and cause loss of productivity and energy, making life more challenging by causing various complications (Kaya et al., 2015).

According to the 2017 US Renal Diseases Data Registry Report,chronic renal disease is present in 14.1 % (approximately 46 million) of census(Saran et al., 2018). According to the 2017 Turkey Kidney Registry Report published by the Turkish Nephrology Association, there are approximately 58,635 patients undergoing hemodialysis and 3,346 patients undergoing peritoneal dialysis in our country(Dernegi, 2017). Hemodialysis is the most common treatment method used for chronic renal failure in our country. Dialysis does not only prolongs the life span of the patient, but also affects the quality of life. Patients with CRF spend long time periods on machine and are depended to dialysis machine, healthcare institution and even the healthcare providers on certain days and hours of the week. This negatively affects the working life of the individual and may cause loss of employment and impair the quality of life by limiting family and social life (Alemdar & Pakyuz, 2015). The fluid control can be

challenging for hemodialysis patients; in addition, fluid overload due to excessive fluid intake can also be an important problem. Clinical signs such as hypertension, peripheral edema or severe pulmonary edema and weight gain occur in patients with hypervolemia; thus, it becomes difficult to assess the fluid volume in the patients and ensure compliance to fluid restrictions. In general, it is well-known thatinadherence to treatment and fluid restriction are common problems in hemodialysis patients(Balım & Pakyüz, 2016). However, complianceto fluid restrictions is extremely important for treatment success (Gunalay, Taskiran, & Mergen, 2017). Nutrition and nutrition-related problems, another commonly seen issue in hemodialysi patients, are strictly associated with morbidity and mortality. Inadequate foot intake is most common cause of nutritional problem. This may be due to nausea caused by uremic toxins, vomiting, anorexia, diabetic or uremic gastroparesis and socioeconomic problems(Oguz, Erek, & Dede, 2013). Dietary complianc is of important fordecelerating disease progresion, preventing complications and minimizing symptoms such as such as nausea, vomiting, itching and pain (Kocamis, Turker, Koseler, Kiziltan, & Ok, 2016). Nutrition is directly related to mortality and quality of life in the hemodialysis process; thus, diet should be individualized. Compliance to hemodialysis therapy includes fluid restriction, adherence to dietary recommendations and drugs prescribed and attendance to dialysis sessions scheduled (Oguz et al., 2013). Compliance to dietary recommendations and fluid restriction are extremely important for treatment success in these patients. Improved compliance positively affects the life expectancy and quality of life in these patients (Kara, 2009). Incompliance may lead increased complication rates and healthcare costs as well as decreased survival(Günalay et al., 2017). Clinical evidence shows that the quality of life is an important indicator for effectiveness of care, dialysis success, morbidity and mortality. It becomes increasingly important to monitor quality of life and related-factors and to provide appropriate interventions and nursing in appropraite and timely manner (Aghakhani, Samadzadeh, Mafi, & Rahbar, 2012). Thus, it was aimed to evaluate effects of malnutrition and fluid control on quality of life in hemodialysis patients in this study.

Methods

Study Design: This descriptive study was conducted to determine the effect of malnutrition and fluid control on the quality of life in hemodialysis patients.

Study Settings: The research was conducted at the hemodialysis units of two state hospital in Eskişehir between June, 2018 and August, 2018.

Study Population: The descriptive research was aimed to recruitpatients undergoing hemodialysis treatment (N = 150) in hemodialysis units of two state hospitals in Eskişehir between June, 2018 and August, 2018. The study population included patients who accepted to participate in the study (N=122).

Data Collection Tools: Individual Data Sheet, Mini Nutrition Assessment (MNA-SF), Fluid Control in Hemodialysis Patients Scale (FCHPS) and EQ5D General Quality of Life Scale in Hemodialysis Patients were used to collect relevant data in the study.

Individual Data Sheet: It was prepared by the researcher based on literature and includes items on demographic characteristics such as age, gender, marital status, education, residency as well as hemodialysis.

Mini Nutrition Assessment Test (MNA-SF):MNA is a widely used test in the assessment and early identification of malnutrition. It was developed by collaborative efforts of Toulouse University, New Mexico School of Medicine and the Swiss Nestle Research Center in 1994 and was validated in 2001 by Rubenstein et al. The Turkish validity and reliability was proven by Sarıkaya. MNA-SF score is calculated by appetite status of the patients, weight loss, mobility, psychological distress or acute illness, neuropsychological problems and body mass index within prior 3 months. MNA-SF score of 12-14 points is considered as normalwhile score of 8-11 points as at risk and 0-7 points as malnutrition(Sarikaya et al., 2015).

Fluid Control in Hemodialysis Patients Scale (FCHPS): It was developed to measure the knowledge, behavior and attitudes of chronic hemodialysis patients about fluid restriction by Coşar and Çınar in 2012. It includes 24 items rated by a 3-points Likert scale (agree, neither agree nor disagree, disagree) since cognitive dysfunction is common among hemodialysis patients. The scale has3 sub-domains: knowledge (items 1, 2, 3, 4, 5, 6, 7), behavior (items 8, 9, 10,

11, 12, 13, 14, 15, 16, 17, 18, 19) and attitude (items 20, 21, 22, 23, 24). The items 6, 7, 18, 19, 20, 21, 22, 23, 24 were rated in opposite direction.

The total score rangesfrom 24 to72. Higher total score indicates that favorable knowledge, behavior and attitudes while lower scores indicate negative knowledge, behavior and attitudes in hemodialysis patients. The Cronbach alpha reliability coefficient was found to be 0.88 in the study by Cosar and Cinar(Cosar, 2012).

EQ-5D General Quality of Life Scale: EQ-5D is a general health scale used to measure quality of life. The scale was developed by EuroQol group of the Western European Quality of Life Research Society in 1987 and includes 2 parts.

EQ-5D index scale: It includees five domains: mobility, self-care, usual activities, pain / discomfort and anxiety / depression. Each domain is responded as: "I have no problem", "I have moderate problem" or "I am unable". As a result, 243 (3^5=243) possible different health outcomes are defined by the scale. The scale can be scored between 0-1.

EQ-5D VAS scale: It is a visual analog scale in which individuals give values between 0 and 100 about their current health status and mark it on a thermometer-like scale. Quality of life scores ranging from 0 to 100 are obtained with the scale.

Data collection: In study centers, the patients undergoing hemodialysis were informed about the purpose, scope, duration and method of the study. After making the necessary explanation, face-to-face interviews were performed with the patients who accepted to participate in the study and the relevant forms and scales were completed.

Ethical Aspect of the Study: The study was approved by Ethics Committee of Medicine School (TÜTF-BAEK 2018/215/10/15) and Institutional approval was obtained from participating centers. All participants gave written informed consent.

Limitations of the study: The study has limitations including being conducted with patients treated in only two hospitals and use of self-reported data.

Data Analysis: Statistical analyseswere performed by SPSS version 22.0(Statistical Package for the Social Sciences) using descriptive (number, percentage, arithmetic mean and standard deviation) and comparative statistics (Mann Whitney U Test, Kruskall Wallis Test). Pearson's correlation test was used to determine the relationship between the scales. The significance level was set as $p < 0.05$.

Results

The mean age was 61.42 ± 13.91 years. Of the patients, 50.8 % were male; 79.5% had primary school degree and 57.4% were married while 94.3% reported that they are unemployee; 62.3% reported income less than their expenses; 59.0% were living with their spouses and children. Of the patients, 52.5% reported incompliance to dietary recommendation; 88.5% were undergoing dialysis three times per week; and 84.4% had a chronic disease other than CRF. It was determined that mean duration of hemodialysis treatment was 6.68 ± 5.46 years and mean weight gain between two hemodialysis sessions was 2192 ± 974.56 g (Table 1).

The mean total FCHPS scorewas 54.69 ± 7.95 while mean total score was 19.20 ± 2.51 in the knowledge subscale, 23.03 ± 5.04 in the behavior subscale, and 12.45 ± 3.21 in the attitude subscale. Mean MNA score was found as 9.77 ± 2.08. In addition, mean EQ-5D General Quality of Life Scale index score and VAS score were found as 0.59 ± 0.30 and 50.16 ± 21.70, respectively.

Table 3 presents comparison of mean FCHPS, Mini Nutrition Test and EQ-5D General Quality of Life Scale total and sub-dimensions scores according to their individual characteristics. A significant difference was found between the gender and FCHPS behavior subdimension and between the mean total score and the mean EQ-5D VAS score ($p < 0.05$). It was found that the mean score was higher in male patients than female patients. A significant difference was found between employment status, EQ-5D General Quality of Life Scale Index and VAS scores ($p < 0.05$). Both score points were higher in employees than unemployees. A significant difference was found between the family members lived and FCHPS behavior subscale scores ($p < 0.05$). It was determined that patients who lived alone had higher scores than remaining patients. A significant difference was found between dietary compliance and the FCHPS total score ($p < 0.009$) and attitude sub-dimension score ($p < 0.000$). A significant difference was found between dietary compliance and the MNA score($p < 0.05$). It was found that the patients reporting compliance to dietary recommendations achieved higher scores than the remaining patients.

When correlation samong scores were evaluated, it was found that there was a weak positive correlation among mini nutritional assessment, quality of life VAS score (r = 0.297, p = 0.001) and index score (r = 0.382, p = 0.000). In addition, a strong positive correlation was found between the quality of life VAS score and the index score (r = 0.840, p = 0.000).

Table 1. Individual Characteristics of Patients (n: 122)

Variable	**Number (n)**	**Percent (%)**
Sex		
Famale	60	49.2
Male	62	50.8
Marital status		
Married	70	57.4
Single	52	42.6
Education		
Primary school	97	79.5
Elementary school	12	9.8
High school	13	10.6
Working condition		
Unemployee	115	94.3
Employees	7	5.7
Income status		
Income less than expense	76	62.3
Equal	39	32.0
More than income	7	5.7
Who lives		
Alone	8	6.6
Mother and father	17	13.9
Partner and child	72	59.0
Children	25	20.5
Compliance with diet		
Yes	58	47.5
No	64	52.5
Number of dialysis per week		
2	14	11.5
3	108	88.5
Chronic disease other than CRF		
Yes	103	84.4
No	19	15.6
Variable	**Mean ± SD (min.- max.)**	
Age	61.42±13.91 (min=23, max=87)	
Year of receiving hemodialysis treatment	6.68±5.46 year	
Between two hemodialysis sessions weight gain	2192±974.56 gr	

Table 2. Mean Scores in FCHPS, Mini Nutrition Assessment and EQ5D General Quality of Life Scale

FCHPS	**Mean ± SD**	**Scale score**
Knowledge	19.20±2.51	7-21
Behavior	23.03±5.04	11-33
Attitude	12.45±3.21	6-18
Total	54.69±7.95	24-72
Mini Nutrition Assessment Test	9.77±2.08	12-14 normal 8-11 risk 0-7 malnutrition
EQ-5D General Quality of Life Scale		
Indeks skor	0.59±0.30	0-1
VAS skor	50.16±21.70	0-100

Table 3. Comparison of FCHPS, Mini Nutrition Test and EQ-5D General Quality of Life Scale Mean Scores According to Individual Characteristics of Patients

Variable	**FCHPS**				**Mini Nutrition Assessment**	**EQ-5D General Quality of Life Scale**	
	Knowledge	**Behavior**	**Attitude**	**Total**		**Indeks Skor**	**VAS Skor**
	X±SD	**X±SD**	**X±SD**	**X±SD**	**X±SD**	**X±SD**	**X±SD**
Sex							
Female	19.14±2.78	21.41±5.04	12.24±3.16	52.80±8.89	10.06±1.89	0.57±0.30	47.33±20.32
Male	19.26±2.22	24.70±4.45	12.68±3.28	56.65±6.33	9.48±2.22	0.61±0.31	52.93±22.78
p	0.691*	**0.000***	0.591*	**0.009***	0.140*	0.219*	**0.049***
Marital status	19.24±2.35	22.71±5.17	12.17±3.05	54.12±8.18	9.91±2.12	0.63±0.29	51.42±21.21
Married	19.15±2.73	23.46±4.88	12.84±3.40	55.46±7.62	9.57±2.02	0.54±0.31	48.46±22.43
Single	0.866*	0.409*	0.315*	0.384*	0.242*	0.105*	0.440*
p							
Working condition							
Employees	19.57±1.98	21.71±4.75	11.71±3.54	53.00±7.85	10.14±2.19	0.92±0.09	72.85±12.53
Unemployee	19.18±2.54	23.11±5.07	12.50±3.20	54.80±7.97	9.74±2.08	0.57±0.03	48.78±21.40
p	0.793*	0.430*	0.756*	0.601*	0.454*	**0.001***	**0.003***
Who lives							
Alone	20.12±1.80	25.00±3.38	13.25±3.49	58.37±7.32	9.50±1.85	0.53±0.36	47.50±25.49
Motherand	18.58±3.50	20.23±4.84	12.76±2.96	51.58±8.39	9.1±2.36	0.60±0.37	52.35±27.73
father	19.27±2.33	22.88±5.18	12.40±3.20	54.56±8.02	9.95±2.04	0.61±0.30	50.13±21.12
Partner and	19.12±2.45	24.72±4.47	12.16±3.46	56.00±7.23	9.76±2.06	0.55±0.25	49.60±18.59
child	0.655**	**0.021****	0.875**	0.139**	0.443**	0.511**	0.850**
Children							
p							
Dietary compliance	19.46±2.47	23.43±4.59	13.58±3.31	56.48±7.20	10.18±2.11	0.61±0.29	51.25±20.58
Yes	18.96±2.54	22.67±5.43	11.43±2.77	53.07±8.29	9.31±1.95	0.57±0.32	48.96±22.99
No	0.132*	0.404*	**0.000***	**0.009***	**0.005***	0.507*	0.710*
p							

*Mann Whitney U Test, **Kruskall Wallis Test

Table 4. The Relationship Between the Scores of the Patients

	EQ-5D VAS Skor	EQ-5D Indeks Skor	FCHPS
FCHPS			-
r	0.104	0.132	
p	0.255	0.147	
MNA –SF			
r	0.297	0.382	0.034
p	**0.001**	**0.000**	0.712
EQ-5D Indeks Skor		-	-
r	0.840		
p	**0.000**		

Pearson Korelasyon Analizi

Discussion

Restriction of fluid intake is reported as the most challenging factor in the diet of patients undergoing hemodialysis(Denhaerynck et al., 2007), and studies indicate that the level of inadherenceto fluid restriction is between 10-60 % (15-16-17). When we examined the total score of Fluid Control Scalein Hemodialysis Patients (24-72), it was found as 54.69 ± 7.95, indicating scores ahead of curve. In addition, knowledge sub-dimension score (7-21) was found as 19.20 ± 2.51 while behavior sub-dimension score (11-33) as 23.03 ± 5.04 and attitude sub-dimension score (6-18) as 12.45 ± 3.21, indicating fluid control above ahead of curve. In a study about level of compliance to fluid restriction in patients undergoing hemodialysis, Karabulutlu and Yılmaz(Karabulutlu & Yılmaz, 2019) reported that compliance to fluid control was moderate by 51.23 ± 5.88 . in addition, authors reported that knowledge sub-dimension score was 20.22 ± 1.07 while behavioral sub-dimension score 22.42 ± 4.23 (moderate) and the attitude sub-dimension score was 8.59 ± 2.61 (low) in agreement with our study regarding total FCHPS, behavior and knowledge sub-dimension scores. In agreement with out study, in a study on compliance to fluid restriction and activity level, Şahin et al. (Sahin, Pakyuz, & Caydam) showed that the mean FCHPS score was 52.93 ± 6.07 while the mean knowledge, behavior and attitude sub-dimension scores were 18.56 ± 1.97, 21.75 ± 3.71 and 12.62 ± 2.88, respectively. Based on our results, one should suggest that fluid control and knowledge, attitude and behavior regarding fluid control were above curve head in hemodialysis patients in our study. The weight gain of 2162 ± 974.56 gr between two hemodialysis sessions supports our findings.

In hemodialysis patients, association of nutrition and accompanying problems with morbidity and mortality have also been investigated(Richard, 2006). In hemodialysis patients, causes underlying malnutrition are malnutrition, metabolic and endocrine disorders, increased protein catabolism, comorbid chronic diseases and surgical diseases among others(Koo et al., 2003). It has been reported that protein and calori intake was lower than required in majority of hemodialysis patients (Bossola et al., 2005). Evcen et al. (Evcen, 2016) examined the relationship between frailty and nutritional parameters in patients with chronic renal failure, reporting that rate of patient with malnutrition was 22% and rate of patients at risk of malnutrition was 63%. Yakar et al. (Yakar, Demir, & Canpolat, 2019) reported that the risk for malnutrition in 20.2% and malnutrition in 32.1% of hemodialysis patients. In our study, the Mini Nutrition Asseessment scores indicated risk for malnutrition by 9.77 in agreement with ltierature.

In nation-wide and international studies on quality of life in dialysis patients it was shown that dialysis limits and even negatively affects daily activities in dialysis patients through its effects on the mental state and social relations (Keith, Nichols, Gullion, Brown, & Smith, 2004; Levey et al., 2007; Lysaght, 2002). In a study on quality of life in hemodialysis patients, Pehlivan et al. (Pehlivan et al., 2016) reported thatquality of life was moderate in hemodialysis patients. In a study on relationships between malnutrition and quality of life in hemodialysis and peritoneal dialysis patients , Gunalay et al., (2017) reported that the mean EQ5D index score was 0.60 ± 0.29 and the mean VAS score as 66.7 ± 22.3. In our study, in agreement with literature, we found that the mean EQ5D General Quality of Life Scale Index and VAS scores were 0.59 ± 0.30 50.16 ± 21.70 points, respectively.

In our study, significant differences were found between gender and the total score of FCHPS,

behavior sub-dimension of FCHPS and VAS score of the General Quality of Life Scale. It was reported that male patients had higher scores than female patients. This result suggests that, albeit being insufficient, male patients are more successful than women in translating their knowledge and attitudes into behavior, resulting in favoable effects on quality of life. Genc et al. investigated the differences in physical activity and quality of life between young adult men and women and found a significant relationship between physical activity duration and quality of life in men(Abdurrahman, Sener, Karabacak, & Kagan, 2011). Naalweh et al. (Naalweh et al., 2017) investigated the treatment compliance and perception of hemodialysis patients, and it was reported that compliance with fluid restriction and treatment adherencewere higher in male patients. Again, Arslan and Bolukbas also reported that the total quality of life score was higher in men (Arslan, 2000).

When we compared General Quality of Life Scale scores with the employment status; the index score and VAS score were found to be significantly higher in the employees than those unemployed. The FCHPS knowledge sub-dimension and mini nutritional assessment scores in working patients were found to be higher than the those unemployed but it did not reach statistical significant, suggesting that working patients experience less physical problems. Krespi et al., (Krespi, Bone, Ahmad, Worthington, & Salmon, 2008) reported that patients do not feel themselves restricted for situations such as making special adjustments to their lives, creating a new lifestyle or changing the outlook on life, and that they can cope with these situations. Being active in working life also prevents patients from feeling limited.

When previous studies on the quality of life in hemodialysis patients in the literature are examined; it was seen that caregivers of hemodialysis patients are generally defined their patients as supportiv (Belasco & Sesso, 2002; Given, Sherwood, & Given, 2008). However, in some studies, patients also mentioned that they had negative experiences with caregivers. Patients, who think that caregivers do not support them, do not understand them, cause them difficultiesand being source of stress for them, reported feelings of resentment, anger, disappointment, and guilt towards their caregivers and it has been reported that patients who experience abov-mentioned feelings desire to be sufficient for and able to care themselves (Krespi et al., 2008). In a study by Boyer et al. (1990), it was reported that caregivers have negative effects on treatment compliace and treatment continuation in hemodialysis patients. In our study, FCHPS behavioral sub-dimension living alone were found to be significantly higher in patients living alone than remaining patients ($p < 0.021$). This finding supports the view that individuals living alone want to take responsibility, self-sufficiency and take care of themselves.

In chronicrenal failure, eutrophy aims to reduce uremic toxicity, to correct systemic complications caused by nephron loss, to slow the progression of the disease, and to provide an appropriate nutrition by improving the patient's appetite. As a result, the adaptation process of the patients to fluid control will increase and fluid-electrolyte imbalances will also be regulated (Harris, Elder, Karaitis &Rangan., 2008). Failure in fluid control results in chronic fluid overload, contributing to cardiovascular mortality (Nolte Fong, Moore., 2018). When nutritional status was compared with the FCHPS and Mini Nutrition status in our study, it was found that FCHPS total score ($p < 0.009$) and attitude subdimension ($p < 0.000$) scores was well as total Mini Nutrition Assessment score ($p < 0.005$) were higher in the patient repoted better compliance to dieatary recommendations than remaining patients, supporting literature.

In this study, it was found that there was a weak positive correlation among Mini Nutrition Assessment, the quality of life VAS and index scores; in addition, a strong positive correlation was found between the quality of life VAS score and the index score. Gunalay et al. (2017) reported that the patients with malnutrition and low Mini Nutrition Assessment score also had lower scores in both EQ5D index and VAS index of the quality of life. Miller et al. (2002) reported that patients who adhere to the recommended diet had better metabolic control, ie blood values such as urea, uric acid, and creatine. In addition, it has been reported that obesity-related disorders led an increase in the incidence of dialysis complications; therefore, the quality of life is higher in patients with compliance to dietary recommendations. Our findings were in agreement with the literature, and it was observed that accurate and adequate nutrition contributed positively to the quality of life in hemodialysis patients.

Conclusions: In our study, it was concluded that hemodialysis patients are at risk of malnutrition.

It was determined that knowledge, attitude and behavior regarding fluid control were ahead of curve and and quality of life was moderate in hemodialysis patients. It was observed that quality of life was improved by improving nutritional status. The holistic care approach by nurses will contribute to enhance compliance potential regarding fluid restrictions and dietary recommendations in patients undergoing hemodilaysis and improve quality of life.

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