ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

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The Effects of Fluid Management Training Given to Hemodialysis Patients on Their Fluid Control Skills, Pre- and Post-Dialysis Dry Weights and Quality of Life

Hemodiyaliz Hastalarına Verilen Sıvı Yönetimi Eğitiminin Sıvı Kontrolü, Diyaliz Giriş Çıkış Kuru Ağırlıkları ve Yaşam Kalitesi Üzerine Etkileri

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This study was prepared based on the findings of Tuba KARABEY's thesis study titled "The effect of fluid management training on hemodialysis patients on fluid control, dialysis intake DRY weight and quality of life" (Sivas: Cumhuriyet University; 2017).

ABSTRACT Objective: The study was conducted to assess the effect of fluid management training given to hemodialysis patients on their fluid control skills, pre-and post-dialysis dry weights and quality of life. **Material and Methods:** This experimental and cross-sectional study was conducted to assess the effect of fluid management training given to hemodialysis patients on their fluid control skills, pre- and post-dialysis dry weights and quality of life. The study involved 80 patients who underwent dialysis in the Hemodialysis Unit in 2016. Of them, 40 were assigned to the intervention group and 40 were assigned to the control group using the simple random sampling method. The Patient Information Form, the Fluid Control and the Short Form-36 Quality of Life Scale were used. The data collected were analyzed using the SPSS 22.0 package program. For the statistical analysis, the Chi-Square, Friedman's test and Mann-Whitney U test were used. **Results:** Our result showed that the fluid intakes of the patients in the intervention group in the last two consecutive follow-ups decreased statistically significantly compared to their pre-observation fluid intakes, that there was a decrease in their pre-and post-dialysis dry weights and that their quality of life increased as their fluid control improved. **Conclusion:** Fluid management training given to the hemodialysis patients positively affected their fluid control skills, pre-and post-dialysis dry weights and quality of life.

Keywords: Fluid balance; hemodialysis; patient education; quality of life

ÖZET Amaç: Bu çalışma hemodiyaliz hastalarına verilen sıvı yönetimi eğitiminin, sıvı kontrolü, diyaliz giriş çıkış kuru ağırlıkları ve yaşam kalitesi üzerine etkilerinin değerlendirilmesi amacıyla yapılmıştır. **Gereç ve Yöntemler:** Deneysel ve kesitsel olarak yapılan çalışmaya 2016 yılında Hemodiyaliz Ünitesinde diyalize giren 80 hasta alınmış ve basit rastgele örnekleme yöntemi ile bu hastaların 40'ı müdahale grubuna, 40'ı kontrol grubuna atanmıştır. Çalışma verilerinin toplanmasında Hasta Bilgi Formu, Sıvı Kontrol Ölçeği ve Short Form-36 Yaşam Kalitesi Ölçeği kullanılmıştır. Veriler SPSS 22,0 paket programına yüklenmiş ve istatistiksel analizde Ki-Kare, Friedman F, Mann-Whitney U testleri kullanılmıştır. **Bulgular:** Çalışmamızda müdahale grubundaki hastaların izlem öncesine göre özellikle ardışık son iki izlemde istatistiksel olarak önemli düzeyde sıvı alımlarının azaldığı, diyalize giriş-çıkış kuru ağırlıklarında düşüş olduğu ve sıvı kontrolü attıkça yaşam kalitelerinin yükseldiği saptanmıştır. **Sonuç:** Elde edilen bulgular doğrultusunda, hemodiyaliz hastalarına verilen sistematik sıvı yönetimi eğitiminin hastaların sıvı kontrolü, diyaliz giriş çıkış kuru ağırlıkları ve yaşam kalitesini pozitif yönde etkilediği söylenebilir. Bu bağlamda hemodiyaliz sürecinin niteliğini artırmada planlı ve sistematik eğitimin önemli olduğu ve hemşirelere de bu alanda büyük sorumlulukların düştüğü ifade edilebilir.

Anahtar Kelimeler: Sıvı dengesi; hemodiyaliz; hasta eğitimi; yaşam kalitesi

Hemodialysis process, changes in fluid electrolyte balance, increased fatigue in the patient, and weakness, and losses brought about by these changes came to the forefront.[1-4]

In the literature, it is stated that noncompliance with dietary and fluid restriction in individuals undergoing hemodialysis leads not only to fluid

electrolyte imbalances and malnutrition but also to an increase in the mortality rate.[5] In their study of hemodialysis patients, Kugler et al. (2005) reported that while 81.4% of them did not comply with the dietary restriction, 74.6% did not comply with the fluid restriction.[6]

One of the important parameters in the prevention of health problems and achievement of fluid management and control in hemodialysis patients is dry weight concept. Determining of the dry weight to assess the fluid volume in hemodialysis patients is of great importance.[7]

Today, it is emphasized that the main purpose of hemodialysis is not only to extend the life span but also to maintain and improve the quality of life.[7,8]

There should be cooperation between the members of a multidisciplinary team during the treatment process of hemodialysis patients. Therefore, nurses who have the longest interaction with patients and who can observe and evaluate the adaptation to the process have a key role in the team.[5] In the literature, it is stated that if effective nursing interventions are performed in the hemodialysis period, the individuals compliance with dietary and fluid restriction increases and some unwanted health problems can be prevented or reduced.[7,9]

In this context, in the literature, it is emphasized that if individuals undergoing hemodialysis are to improve their compliance with dietary and fluid restriction, they need training.[5,10,11] However, the literature review revealed that the effects of the training given to hemodialysis patients on the results of dry weight measurements and the compliance with fluid control and the quality of life were not investigated together but in separate studies.

In their study, Barnett et al. (2008) provided the patients who did not comply with fluid restriction with the training on the importance of fluid control, water and sodium intake, controlled weight gain and complications of excessive fluid intake, and found that there was a decrease in their average weight gain between the two dialysis sessions.[12]

Thus, it is assumed that there is a need for studies investigating the effects of the fluid-management training on these three important parameters holistically. In this respect, this present study was aimed at investigating the effect of the planned fluid management training given to hemodialysis patients on their fluid control skills, pre- and post-dialysis dry weights and quality of life.

Research Hypotheses

- H1: The planned fluid management training given to hemodialysis patients reduces the volume of fluid intake.
- H2: The planned fluid management training given to hemodialysis patients reduces their pre-dialysis dry weights
- H3: The planned fluid management training given to hemodialysis patients increases their mean knowledge scores obtained from the Fluid Control Scale.
- H4: The planned fluid management training given to hemodialysis patients increases their mean behavior scores obtained from the Fluid Control Scale.
- H5: The planned fluid management training given to hemodialysis patients increases mean attitude scores obtained from the Fluid Control Scale.
- H6: The planned fluid management training given to hemodialysis patients improves their quality of life.

MATERIAL AND METHODS

TYPE OF THE STUDY

The study is an experimental and cross-sectional one.

Population and Sample of the Study

The study was conducted in Sivas, one of the largest cities in the Central Anatolia Region of Turkey. The study sample comprised 80 patients who underwent hemodialysis between June 15, 2016 and December 15, 2016 at the Hemodialysis Unit of Sivas Numune Hospital. Of them, 40 were assigned to the intervention group and 40 were as-

signed to the control group. The participants were randomly assigned to the intervention and control groups using the random number table, and a sample group was created to include 40 patients in the intervention and 40 patients in the control group.

Inclusion Criteria

- Being able to speak and understand Turkish,
- Volunteering to participate in the study and agreeing to give the written consent,
- Being in the age range of 18-74 years,
- Having a place and time orientation,
- Not receiving mechanical ventilation support,
- Having had hemodialysis treatment for at least 3 months,
- Having no diagnosed psychiatric disorder,
- Having no vision and/or hearing impairment.

Data Collection Tools

Three forms were used to collect the study data: The Patient Information Form, the Short Form-36 Quality of Life Scale, and the Fluid Control in Hemodialysis Patients Scale.

Patient Information Form

The Patient Information Form prepared by the researchers based on literature knowledge consists of three parts. In the first part, there are eight items questioning the patient's age, gender, education, family type, occupation, income status. The second part has nine items questioning the number of weekly hemodialysis sessions, the length of each hemodialysis session, smoking habits, and alcohol use. The third part includes a chart on which pre- and post-dialysis dry weights, the volume of fluid intake and the volume of urine output are shown.

Short Form (SF)-36 Quality of Life Scale

This scale developed by Ware and Sherbourne (1992) was designed to be used in individual assessment, clinical practices and research, evaluation of health policies and investigation of general population.[13] The validity study of the Turkish version of the SF-36 was conducted by Koçyiğit et al. (1999). The SF-36 Quality of Life Scale is a self-administered scale and consists of 36 questions that measures eight domains of health-related quality of life: (1) Physical Functioning, (2) Physical Role Limitations, (3) Emotional Role Limitations, (4) Bodily Pain, (5) Social Functionality, (6) General Mental Health, (7) Energy / vitality and (8) General health. While the arithmetic mean of the first 5 of these 36 questions is considered as the Physical Component Score (PCS), the arithmetic mean of the last 5 is considered as the Mental Component Score (MCS). The arithmetic mean of all the 8 components makes the SF-36 score. The scoring for each scale ranges from 0 to 100. While 100 points indicate good health status, 0 points indicate bad health status.[14]

Fluid Control in Hemodialysis Patients Scale

The scale was developed by Vlaminck et al. (2001) to measure hemodialysis patients' knowledge of and behavior and attitudes towards fluid restriction. The scale has 24 items and three subscales: Knowledge (items 1-7), Behavior (items 8t-18) and Attitudes (items 19-24). While statements 1 and 2 in the scale refer to non-compliance with fluid restriction in terms of frequency and degree, statements 3 and 4 refer to non-compliance with dietary restriction. The degree of the non-compliance with dietary and liquid restriction is rated on a 5-point Likert scale ranging between 0 and 4 (no non-compliance=0, mild non-compliance=1, moderate non-compliance=2, severe non-compliance=3 and very serious non-compliance= 4).[15] As the scores on the scale increase, the patients' compliance with dietary and fluid restriction decreases. In a study conducted by Kara (2009), the scale was administered to 20 hemodialysis patients to obtain their opinions whether the scale was readable and comprehensible, and it was determined that the items on the scale were correctly understood by the patients.[16]

Study Plan and Implementation of the Data Collection Tools

During the study process, the participants in the intervention and control groups were scheduled to

have three follow-ups in the hemodialysis unit in the first, third and sixth months of the study. In these follow-ups, the data collection forms were filled in by the participants. For the illiterate participants, the forms were filled in by their relatives. If the illiterate participants had no relatives, then the forms were filled in by the researcher in the hemodialysis unit through the face-to-face interview.

In the first interview performed in the Hemodialysis Unit, the first two sections of the Patient Information Form, Short Form-36 and Fluid Control Scale were filled in by the participants in the intervention and control groups. Then the schedule for the three follow-ups to be carried out was determined together with the patient. Later, the participants were trained on how to monitor fluid intake and urine output. A small notebook was given to the patient or his/her relative to record the necessary information, and a urine collection container. The patient or his/her relative was asked to collect his/her 24-hour urine for 5 days and to record the total amount of urine collected on the previously provided notebook at the end of each day. Thus, the average volumes of the fluid intake and urine output were determined and the efficacy of the fluid management training was evaluated.

In the first interview in the hemodialysis unit, the participants in the intervention group were given individual fluid management training in accordance with the training booklet to be used in the research which was prepared based on the literature after they were given training on the use of Intake Output Chart. In the training, the individual characteristics of the patients were taken into consideration and their questions about the issue were answered. The training given lasted approximately 45 minutes. At the end of the training, the booklet was given to the patients or their relatives for later use.

Within the scope of fluid management, the booklet provides information on foods such as canned or frozen foods ready to eat, processed meat like bacon, chips and crackers, ready-made soups, meat/chicken bouillon cubes, homemade or ready-made tomato pastes which should be avoided due to their high salt content. In the book, it was emphasized that in order to reduce the fluid consumption, the amount of water to be consumed should be put into a measuring jug and that this water should be consumed throughout the day. It was also recommended to keep the track of the volume of water consumed on a piece of paper stuck on the refrigerator, to use a small glass to drink any kind of liquid, to avoid foods with excess salt content, to eat the fruit allowed by the dietitian between the meals, to chew thinly sliced lemon peels for dry mouth, to take pills with water drunk during meals, to keep oneself busy to forget the feeling of thirst, to rinse the mouth with water but not to drink it, to chew chewing gum and to put a cup of water on the stove or heater to humidify the room air which helps prevent dry mouth. In the booklet, it was also recommended that many fruits and vegetables such as melons, watermelons, tomatoes, lettuce and celery should be consumed in limited quantities, since they contain a lot of water. The training ended after the first interview. The patients were called 6 days before the first follow-up and reminded to keep the record of fluid intake and urine output for the last 5 days before the follow-up.

In line with the schedule previously prepared, the researcher met the patients in the hemodialysis unit at the end of the first, third and sixth months when the follow-ups were performed. While the patients in the intervention and control groups filled in the 3rd part of the Patient Information Form for the first time in the first follow-up, the Fluid Control Scale, SF-36 and 3rd part of the Patient Information Form were re-administered in the second and third follow-ups. The 3rd part of the Patient Information Form was filled in based on the data on the fluid intake and urine output volumes recorded in the notebook by the patients or their relatives during the last 5 days and the data on the pre- and post-dialysis dry weights recorded in the Hemodialysis Unit during the last 5 days.

The participants in the intervention group received the same training again at the end of each follow-up and answered the questions. The participants in the control group did not receive the

training but underwent all the other steps as did the participants in the intervention group.

Ethics of the Study

Before the initiation of the study, Sivas Cumhuriyet University, Faculty of Medicine's Clinical Studies Ethics Committee's approval (Resolution Number: 2016-05/28) was obtained and the written permission was obtained from the administration of the Sivas Numune Hospital where the study was to be conducted. Upon informing the participating patients about the study and obtaining their written consent, the data was gathered by the researches. The patients were informed that participation was voluntary, their names would be written on the data gathering forms but their personal information would only be used in this study and would be kept confidential.

Data Analysis

The data obtained from the study were analyzed using the SPSS (data 22.0) program for the analysis of the data, when the parametric test assumptions were fulfilled, the variance analysis, Tukey test and the test for the significance of the difference between the two means were used to compare the two independent groups in terms of a variable obtained from the measurement. When the parametric test assumptions were not fulfilled, the Kruskal Wallis, Mann-Whitney U test and Chi-square test were used to determine the difference between repeated measurements, the Wilcoxon test and Friedman test were used and the margin of error was accepted as 0.05.

RESULTS

Table 1 contains the descriptive characteristics of the participants in the study. There was no statistically significant difference between the intervention and control groups in terms of the descriptive characteristics of the participants ($p>0.05$). The participants' demographic and hemodialysis characteristics were similar.

The vast majority of the participants in the present study were determined not to have had any training on the disease and hemodialysis process (Table 1). The comparison of the participants in the control and intervention groups revealed that the vast majority of them had not received any hemodialysis training.

Table 2 shows the distribution of fluid intake and urine output volumes of the participants measured before and after the three consecutive follow-ups. The intra-group analysis of the control group demonstrated no statistically significant difference between the group members ($p>0.05$), which showed that the volume of fluid intake by the participants in the control group did not change in the later measurements. While the average volume of fluid intake of the participants in the control group was 2,140 ml in the first and second follow-ups, it was 2,230 ml in the third follow-up. Thus, it was determined that the volume of fluid intake of the participants in the control group in the three consecutive follow-ups did not change significantly. On the other hand, in the intervention group, the volume of fluid intake measured in three consecutive follow-ups demonstrated a statistically significant difference ($p<0.05$). In the light of this result, unlike the control group, the volume of fluid intake in the intervention group was reduced in a controlled manner during the process.

The comparison of the intervention and control groups in terms of the volume of fluid intake measured in the first and second follow-ups demonstrated a statistically significant difference ($p<0.05$), but the difference was not statistically significant in the other measurements ($p>0.05$). The results also showed that in the first and second follow-ups, the participants in the control group consumed more fluid than did the participants in the intervention group (Table 2).

Table 3 shows the distribution of the pre- and post-dialysis dry weights of the participants in the control and intervention groups measured before the study and after each of the three consecutive follow-ups. The intra-group analysis of the control group indicated no statistically significant difference between the pre- and post-dialysis dry weights measured in the three consecutive follow-ups ($p>0.05$). The table shows that although the

TABLE 1: The distribution of introductory characteristics of patients in the control and intervention groups.

Characteristics	Control Group (n=40)	%	Intervention Group (n=40)	%	Test Result (p)
Age (year)					
20-40	2	6	4	10	0.639
40-60	25	62	22	56	
60+	13	32	14	36	
Gender					
Female	15	38	20	50	0.260
Male	25	62	20	50	
Marital Status					
Married	29	72	27	60	0.887
Single	11	28	25	40	
Education					
Illiterate	12	30	13	32	0.919
Literate	14	36	14	36	
Primary Education	8	20	9	22	
High School	6	14	4	10	
Job					
Worker	4	10	4	10	0.790
Official	3	8	2	4	
Retired	9	22	6	16	
Housewife	11	28	17	42	
Self-Employment	13	32	11	28	
Per Week Hemodialysis Session					
Two	8	20	6	15	0.556
Third	32	80	34	85	
Duration of Dialysis					
4 Hours	34	84	34	84	1.000
4 Hours and Over	6	16	6	16	
Hemodialysis Training Status					
Trainee	2	6	2	4	1.000
Untrained	38	96	38	96	
Problem Life Status Due to Hemodialysis Process					
Yes	33	82	30	74	0.412
No	7	18	10	26	

mean pre-dialysis dry weight of the participants in the control group which was 68.95 kg before the follow-ups increased to 69.18 kg, in the third follow-up, their pre- and post-dialysis dry weights did not change in the three consecutive follow-ups. On the other hand, the mean pre-dialysis dry weight of the participants in the intervention group which was 70.09 kg before the follow-ups dropped to 67.55 kg and there was a statistically significant difference between their mean pre-dialysis dry weights measured during the three consecutive follow-ups ($p<0.05$).

The inter-group comparisons revealed a statistically significant difference between the groups in terms of their mean pre- and post-dialysis dry weights before the follow-up ($p<0.05$). While the mean pre-dialysis dry weight in the intervention group was higher than that of the control group, the differences between the groups in the three consecutive follow-ups were not statistically insignificant ($p>0.05$) (Table 3).

Table 4 shows the distribution of the mean scores obtained from the subscales of the Fluid

TABLE 2: The distribution of fluid intake and urine output volumes of the control and intervention group measured before and after the three consecutive follow-ups.

Characteristics	Control Group X±SD	Intervention Group X±SD	Mann-Whitney U Test Result (p)
Measured Before			
Fluid Intake *	2.140±630	2.000±0.59	0.330
Urine Output *	510±200	530±250	0.511
First Follow-Up			
Fluid Intake	2.150±730	1.640±480	**0.001**
Urine Output*	490±0.260	540±270	0.377
Second Follow-Up			
Fluid Intake	2.150±730	1.450±0.35	**0.001**
Urine Output*	490±0.25	530±240	0.345
Third Follow-Up			
Fluid Intake *	2.230±720	1.080±0.72	0.360
Urine Output *	480±240	510±280	0.770
Friedman F Test Result (P)			
Fluid Intake *	0.100	**0.001**	
Urine Output *	0.943	0.033	

* The amount of fluid was calculated in milliliters.

TABLE 3: The distribution of the pre- and post-dialysis dry weights of the participants in the control and intervention groups measured before the study and after each of the three consecutive follow-ups.

Characteristics	Control Group X±SD	Intervention Group X±SD	Mann-Whitney U Test Result (p)
Measured Before			
Pre-Dialysis Dry Weights	68.95±11.23	70.09±10.49	0.001
Post-Dialysis Dry Weights	66.22±11.63	67.45±10.44	0.004
First Follow-Up			
Pre-Dialysis Dry Weights	69.96±12.00	69.28±11.27	0.718
Post-Dialysis Dry Weights	68.39±12.74	67.41±10.90	0.714
Second Follow-Up			
Pre-Dialysis Dry Weights	69.87±11.99	69.37±11.29	0.820
Post-Dialysis Dry Weights	68.29±12.73	67.27±10.95	0.815
Third Follow-Up			
Pre-Dialysis Dry Weights	69.18±12.27	69.26±11.25	0.715
Post-Dialysis Dry Weights	68.19±13.10	67.55±10.95	0.630
Friedman F Test Result (P)			
Pre Dialysis Dry Weights	0.884	**0.001**	
Post Dialysis Dry Weights	0.200	**0.001**	

Control Scale by the participants in the control and intervention groups. The intra-group comparisons demonstrated that there were no statistically significant differences between the subscale scores obtained by the participants in the control group ($p>0.05$). However, in the intervention group, the difference between the mean scores was statistically significant ($p<0.05$).

However, according to the inter-group comparisons, while there were no statistically significant differences between the two groups in terms of the mean scores obtained from all the subscales

during the measurements made before the follow-ups and after the first follow-up ($p>0.05$), there were statistically significant differences between the two groups in the second and third follow-ups ($p<0.05$).

Figure 1 shows the distribution of the mean scores obtained from the subscales of the Quality of Life Scale (SF-36). The intra-group comparisons demonstrated that there were no statistically significant differences in the control group in terms of the mean scores the participants obtained from all the subscales ($p>0.05$). However, the differences in the intervention group were statistically significant ($p<0.05$).

The inter-group comparisons demonstrated that although there were no statistically significant differences between the two groups in terms of the mean scores obtained from all the subscales during the measurements made before the follow-ups and after the first follow-up ($p>0.05$), there were statistically significant differences between the two groups in the second and third follow-ups ($p<0.05$).

Whether there was a statistical relationship between the Fluid Control and SF-36 scales at the same follow-ups was investigated with the correlation analysis. The analysis showed that there was a significant correlation between the scales at each follow-up ($p<0.05$). There was a moderate and negative correlation between the Fluid Control and SF-36 scales before the follow-ups and after the first follow-up ($p<0.05$). However, the correlation determined between the Fluid Control and SF-36 scales in the second and third follow-ups was high and negative ($p<0.05$).

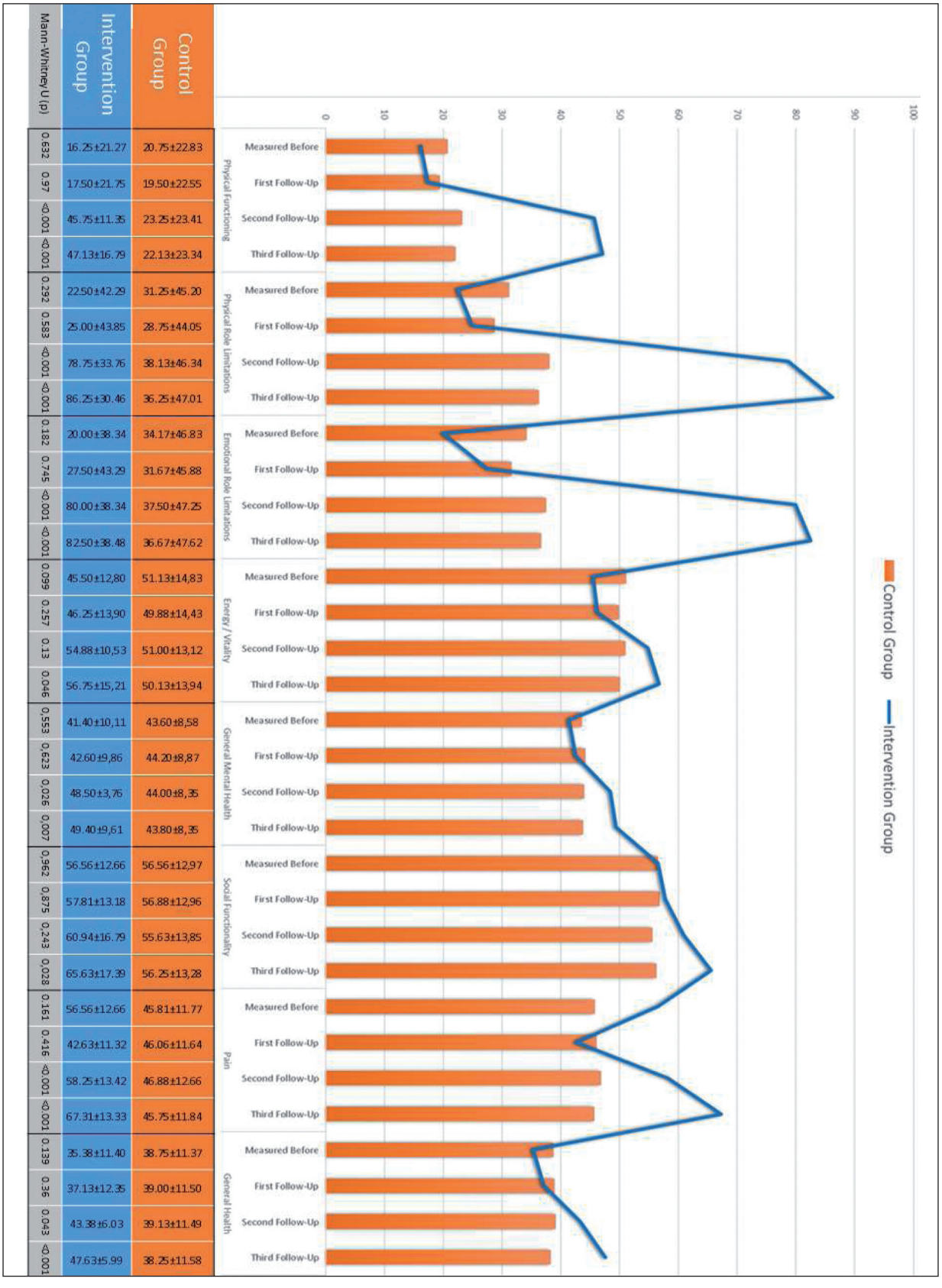
DISCUSSION

In the present study conducted to investigate the effect of the planned fluid management training given to hemodialysis patients on their fluid control skills, pre-and post-dialysis dry weights and quality of life, no statistically significant differences were determined between the intervention and control groups in terms of their descriptive characteristics ($p>0.05$). The participants' demographic characteristics and hemodialysis-characteristics were closely related to each other (Table 1).

Hemodialysis patients' receiving training on their disease and the treatment process is of importance, because the training encourages them to comply with the treatment, to protect themselves from complications and to take responsibility for their own care. However, the vast majority of the patients in the present study had not had any training on the disease and hemodialysis process before the study (Table 1). Therefore, based on the results of the present study and other studies in the literature it can be said that hemodialysis patients are not adequately supported for the problems they are to experience in the difficult process in the future and they are left alone to deal with these problems.[2,17] However, the hemodialysis nurse strengthens patients' coping skills by taking active role in resolving all the biopsychosocial problems likely to be encountered during the process by patients and their families using his/her professional knowledge and skills.[18]

In hemodialysis patients, if the weight gain between two dialysis sessions is more than 5.7% of the dry weight, this is considered as inconsistency in interdialytic weight gain.[19] Despite all the improvements in hemodialysis treatment, excessive fluid intake between the two dialysis sessions is still a serious problem.[17] However, within the scope of the present study, the intervention group was given the fluid management training at the beginning of the treatment period, and thanks to the training, an effective fluid management was achieved in the dialysis process. It was determined that the volumes of fluid intake measured in the three consecutive follow-ups in the patients in the intervention group decreased compared to the volume measured before the follow-ups, and that there was a statistically significant difference between the volumes of fluid intake und urine output and the mean pre- and post-dialysis dry weights ($p<0.005$) (Table 2, Table 3). These results obtained from the study support our hypotheses H1&H2.

For the assessment of the fluid control performed by the patients included in the present study, the Fluid Control Scale was used too. The



	Control Group	Intervention Group	Mann-Whitney U (p)
Physical Functioning – Measured Before	20.75±22.83	16.25±21.27	0.632
Physical Functioning – First Follow-Up	19.50±22.55	17.50±21.75	0.97
Physical Functioning – Second Follow-Up	23.25±23.41	45.75±11.35	<0.001
Physical Functioning – Third Follow-Up	22.13±23.34	47.13±16.79	<0.001
Physical Role Limitations – Measured Before	31.25±45.20	22.50±42.29	0.292
Physical Role Limitations – First Follow-Up	28.75±44.05	25.00±43.85	0.583
Physical Role Limitations – Second Follow-Up	38.13±46.34	78.75±33.76	<0.001
Physical Role Limitations – Third Follow-Up	36.25±47.01	86.25±30.46	<0.001
Emotional Role Limitations – Measured Before	34.17±46.83	20.00±38.34	0.182
Emotional Role Limitations – First Follow-Up	31.67±45.88	27.50±43.29	0.745
Emotional Role Limitations – Second Follow-Up	37.50±47.25	80.00±38.34	<0.001
Emotional Role Limitations – Third Follow-Up	36.67±47.62	82.50±38.48	<0.001
Energy / Vitality – Measured Before	51.13±14,83	45.50±12,80	0.099
Energy / Vitality – First Follow-Up	49.88±14,43	46.25±13,90	0.257
Energy / Vitality – Second Follow-Up	51.00±13,12	54.88±10,53	0.13
Energy / Vitality – Third Follow-Up	50.13±13,94	56.75±15,21	0.046
General Mental Health – Measured Before	43.60±8,58	41.40±10,11	0.553
General Mental Health – First Follow-Up	44.20±8,87	42.60±9,86	0,623
General Mental Health – Second Follow-Up	44.00±8,35	48.50±3,76	0,026
General Mental Health – Third Follow-Up	43.80±8,35	49.40±9,61	0,007
Social Functionality – Measured Before	56.56±12,97	56.56±12.66	0,962
Social Functionality – First Follow-Up	56.88±12,96	57.81±13.18	0,875
Social Functionality – Second Follow-Up	55.63±13,85	60.94±16.79	0,243
Social Functionality – Third Follow-Up	56.25±13,28	65.63±17.39	0,028
Pain – Measured Before	45.81±11.77	56.56±12.66	0.161
Pain – First Follow-Up	46.06±11.64	42.63±11.32	0.416
Pain – Second Follow-Up	46.88±12.66	58.25±13.42	<0.001
Pain – Third Follow-Up	45.75±11.84	67.31±13.33	<0.001
General Health – Measured Before	38.75±11.37	35.38±11.40	0.139
General Health – First Follow-Up	39.00±11.50	37.13±12.35	0.36
General Health – Second Follow-Up	39.13±11.49	43.38±6.03	0.043
General Health – Third Follow-Up	38.25±11.58	47.63±5.99	<0.001

FIGURE 1: Distribution of the mean scores obtained from the subscales of the quality of life scale (SF-36) ın the control and intervention groups.

Fluid Control Scale has three subscales: Knowledge, Behavior, and Attitude. While there were no statistically significant differences (p>0.005) between the mean scores obtained from these three subscales by the patients in the control group before the follow-ups and at the three follow-ups, knowledge, behaviors and attitudes of the participants in the intervention group improved, and their compliance with the fluid restriction increased, and there was a statistically significant difference between these mean scores (p<0.005) (Table 4). These results support our hypotheses H3, H4 and H5. In the present study and similar studies in the literature, it was concluded that the fluid management training given to hemodialysis patients before the process was effective in fluid control in the process.[2,20]

Dialysis patients are to take hemodialysis treatment and to spend most of their time in hemodialysis units in order to survive, which leads to a decrease in patients' quality of life.[2,19-21] In this context, the vast majority of the patients participating in the present study underwent hemodialysis for four sessions per week and spent a significant portion of their time in hemodialysis units. All this process causes a decrease in the quality of life of patients. Indeed, the mean scores the participants in the intervention and control groups in the present study obtained from the Physical Functioning, Physical Role Limitations, Emotional Role Limitations, Bodily Pain, Social Functionality, General Mental Health, Energy/vitality and General health subscales of the SF-36 Quality of Life Scale before the training were rather low. On the other hand, the mean scores obtained by the participants in the intervention group at the three consecutive follow-ups increased gradually, which was considered statistically significant (p<0.005).

However, in this process, there was no change in the mean scores of the participants in the control group and no statistically significant difference was found between their mean scores (p>0.005) (Table 4). The results obtained in the present study support the hypothesis H6.

In the present study, there was a statistically significant negative correlation between the mean

TABLE 4: The distribution of the mean scores obtained from the subscales of the fluid control scale by the participants in the control and intervention groups.

Characteristics	Control Group X±SD	Intervention Group X±SD	Mann-Whitney U Test Result (p)
Knowledge			
Measured Before	1.664±.50	1.600±.31	0.683
First Follow-Up	1.625±.48	1.582±.39	0.818
Second Follow-Up	1.686±.48	1.196±.26	**<0.001**
Third Follow-Up	1.646±.49	1.207±.23	**<0.001**
Friedman F (p)	0.706	**<0.001**	
Behavior			
Measured Before	1.686±.38	1.720±.24	0.646
First Follow-Up	1.705±.39	1.666±.24	0.622
Second Follow-Up	1.641±.37	1.225±.26	**<0.001**
Third Follow-Up	1.680±.38	1.189±.24	**<0.001**
Friedman F (p)	0.622	**<0.001**	
Attitude			
Measured Before	1.779±.36	1.808±.23	0.538
First Follow-Up	1.763±.36	1.721±.24	0.895
Second Follow-Up	1.792±.38	1.338±.25	<0.001
Third Follow-Up	1.779±.37	1.217±.25	**<0.001**
Friedman F (p)	0.572	**<0.001**	

scores the participants obtained from the subscales of the Fluid Control Scale and Quality of Life Scale ($p<0.005$).

CONCLUSION AND RECOMMENDATIONS

In the present study conducted to assess the effect of fluid management training given to hemodialysis patients on their fluid control skills, pre- and post-dialysis dry weights and quality of life, thanks to the training given to the intervention group at the beginning of the treatment process, an effective fluid management was achieved in the dialysis process.

In the three consecutive follow-ups conducted in the study period, the volume of fluid intake and dry weights of the patients in the intervention group were found to decrease compared to values measured before the follow-up. In addition, while there were no changes in fluid management knowledge, attitudes and behaviors of the patients in the control group before and after the three consecutive follow-ups, positive changes were observed in these subscales in the intervention group and their compliance to fluid restriction increased.

In the present study, the mean quality of life scores obtained from the Physical Functioning, Physical Role Limitations, Emotional Role Limitations, Bodily Pain, Social Functionality, General Mental Health, Energy/ vitality and General health subscales by the participants in the control and intervention groups were very low. However, the mean quality of life scores obtained in the three consecutive follow-ups conducted after the training gradually increased in the intervention group. These participants' compliance with fluid restriction increased as their quality of life increased.

In this context, it is recommended that nurses should continue to provide their professional support for patients in the hemodialysis process in order to obtain successful results and strengthen patients through repetitive and systematic trainings.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Tuba Karabey, Şerife Karagözoğlu;* ***Design:*** *Tuba Karabey, Şerife Karagözoğlu;* ***Control/Supervision:*** *Şerife Karagözoğlu, Tuba Karabey;* ***Data Collection and/or Processing:*** *Tuba Karabey, Şerife Karagözoğlu;* ***Analysis and/or Interpretation:*** *Şerife Karagözoğlu, Tuba Karabey;* ***Literatüre Review:*** *Tuba Karabey, Şerife Karagözoğlu;* ***Writing the Article:*** *Tuba Karabey, Şerife Karagözoğlu;* ***Critical Review:*** *Şerife Karagözoğlu, Tuba Karabey.*

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