RESEARCH ARTICLE

The effect of case management with haemodialysis patients on the health perception and the symptoms: The case of Turkey

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Abstract

Objectives: To establish whether case management had an effect on health perceptions and symptom relief in haemodialysis patients.

Methods: The quasi-experimental study was conducted from March to December 2013 in Ankara, Turkey, at three private dialysis centres providing haemodialysis therapy. It comprised chronic haemodialysis patients who were divided into experimental and control groups. In the first interview, the experimental group was provided with extensive training about haemodialysis and a three-month follow-up was conducted through case management. The control group was provided training only in the final interview. Data was collected using the scale for perception of health in haemodialysis patients and the scale for complaints/symptoms in haemodialysis patients. SPSS 20 was used for analysis.

Results: Of the 80 patients, 40(50%) were in each group. There was no significant difference in scale for perception of health in haemodialysis patients scores between first and final interviews ($p>0.05$), whereas the scale for complaints/symptoms in haemodialysis patients scores were lower in the final interview compared to the first $p<0.05$). In the control group, the scale for perception of health in haemodialysis patients scores were higher in the final interview compared to first ($p<0.05$).

Conclusion: Case management was found to be an effective method for minimising negative health perceptions and complaints and symptoms in haemodialysis patients.

Keywords: Symptoms, Complaints, Haemodialysis, Case management, Patient education. (JPMA 68: 1032; 2018)

Introduction

In chronic kidney disease (CKD), the patient enters the end-stage renal disease (ESRD) phase when the glomerular filtration rate (GFR) drops below 15m/min.[1] One of the renal replacement therapies (RRTs) used in this stage is haemodialysis (HD).

Both CKD and the HD procedure pose many risks for HD patients. The presence of diabetes as the primary disease, or excessive interdialytic fluid intake, increases the risk of cardiovascular disease, and this is the major cause of mortality in HD patients. Additionally, prolonged uraemia may lead to uraemic cardiomyopathy.[2] Fluid-electrolyte disturbances (hypophosphataemia, hypocalcaemia, and hypercalcaemia) also cause a range of symptoms in patients.[1,3-5] There is an important relationship between hypertension, salt and sodium. In dialysis patients, excessive salt intake results in interdialytic weight gain (IDWG) and hypertension. It is known that fluid overload in the body causes complications, such as pleural effusion, peripheral oedema, pulmonary oedema, and heart failure, in addition to hypertension.[6] Therefore, salt intake should not exceed 2gm per day for HDpatients.[7] Furthermore, it causes anaemia, fatigue, nausea/vomiting, constipation, bleeding, uraemic pruritus, muscle spasms in the gastrointestinal system and many other symptoms and complaints.[3,8,9] All these complaints impair the patients' quality of life.[10] In order to minimise the risk of morbidity in chronic HD patients, it is important to ensure dietary and fluid control. Eating and drinking are basic requirements for humans and are influenced by socio-cultural structures and traditions. For this reason, it is difficult for patients to change their usual eating and drinking habits.[11] Individuals receiving HD have different dietary habits, knowledge, living conditions, and personal reactions to the limitations prescribed. Previous studies have reported that methods, such as patient education,[12-14] self-monitoring,[15,16] and case management[17] are effective for ensuring compliance of HD patients with dietary and fluid restrictions.

The application is extremely helpful for individuals as they are able to self-monitor their intake. If desired, the Dietary Intake Monitoring Application (DIMA) could also be used for dietary counselling.[15] Case management, which is used in chronic kidney disease as well as many other chronic diseases, is a process used to coordinate the case

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provided to the target patient groups with high risk and high cost in order to improve the care and manage the costs. Recent studies have established the positive effect of case management on chronic diseases.[9,17,18] Furthermore, case management has helped minimise anxiety, made complying with dietary-fluid restrictions easier, while increasing the self-confidence and quality of life of patients with CKD.[17]

The present study was conducted to establish whether case management had an effect on health perceptions and symptom relief in HD patients.

Patients and Methods

The quasi-experimental study was conducted from March to December 2013 in Ankara, Turkey, and comprised three private dialysis centres providing HD therapy. To find a difference with 85% theoretical power and with reliability of 95%, the sample size was determined. The study sample of chronic HD patients was divided into experimental and control groups. The subjects were selected from different dialysis centres in order to avoid interaction between the patients. The subjects were aged 18-65 years under HD therapy for at least six months literate, Turkish-speaking, did not have any communication or mental problems, and volunteered to participatein the study.

Data were collected using the Patient Introduction Form, the scale for perception of health (SPHHP), and the scale for complaints/symptoms in haemodialysis patients (SC-SHP),[19] and the chronic renal failure case management-joint care protocol (CMJCP).[20]

The patient introduction form included sociodemographics, such as age, gender, marital status, educational status, occupation, primary kidney diseases, blood pressure, interdialytic weight gain (IDWG), and blood biochemistry data.

The SPHHP was developed in 2014 and consists of a single factor and 10 items. The answers to the five-point Likert scale are scored as never=0, rarely=1, sometimes=2, often=3, and always=4. When the scale score is higher, the perception of health becomes poorer and the level of disease risk increases. Cronbach's alpha reliability coefficient of SPHHP was 0.80.

The SC-SHP) scale was developed in 2014 and consists of a single factor and 22 items. The answers to the five-point Likert scale are scored as never=0, rarely=1, sometimes=2, often=3, and always=4. When the scale score is higher, the complaints/symptoms become worse and the level of disease risk increases. Cronbach's alpha reliability coefficient of SC-SHP was 0.83.

In the present study the (CMJCP) model, was created according to the Krohwinkel model developed for patients with acute renal failure, and was used by administration to chronic renal failure patients in case management. This model included a total of 13 core life activities such as personal care, exercise, excretion, dressing, and eating and drinking, and the care protocol was prepared according to this model. This care protocol guides the nurses providing care to patients who require intensive care and need RRT.[20] In the present study, case management was used to ensure the maintenance of care and control and to prepare the joint care protocol in haemodialysis patients.

The case management model and joint care protocol form were used in the experimental group, whereas this form was not used in the control group. The training of the patients was shaped through questions and assessments related to the topics of medication, dietary compliance, minimising fluid intake, and self-monitoring.

The data was collected by face-to-face interviews with the patients. Blood biochemistry data was collected from the patients' files.

In the study, three interviews were conducted with the experimental and control groups. In the experimental group, the scales were completed in the first interview, the haemodialysis patients were provided with training and an information leaflet, and the questions were answered. The SMJCP was completed. The patients used the protocol to self-control every month, and an appointment was given for the following month. In the second interview, the patients' questions were answered and information was provided about the topics they wanted. An appointment was then given for two months later and the scales were completed again in the final interview.

In the control group, the scales were completed during the first interview. However, training and leaflets were not provided. In the final interview, the control group patients were provided with guidance and leaflets, taking into consideration the rights of the patients.

Approval for the study was obtained from the ethics committees from the respective dialysis centres. All the subjects provided written informed consent.

SPSS 20 was used for data analysis. The data was expressed in terms of frequency and mean ± standard deviation (SD). The differences between the groups were analysed using the Mann-Whitney U-test for the non-normally distributed variables in paired groups, and using Bonferroni-corrected Kruskal-Wallis H-test for the non-

normally distributed variables in more than two groups. The difference between the measuring times of the values that were measured at different time points was analysed using the Wilcoxon Signed Rank Test for the non-normally distributed variables.

Results

Of the 80 patients, 40(50%) were in each of the two

Table-1: Comparison of Sociodemographic Characteristics of Experimental and Control Groups (n=80).

Sociodemographic Characteristics		Experimental Group (n=40)		Control Group (n=40)		Significance	
						U	P
Age (mean ± SD)		49.65 ± 12.06 (19-65)		51.93 ± 9.63 (23- 65)		737.5	0.547
		n	%	n	%	X^2	P
Gender	Female	25	62.5	20	50.0	0.813	0.367
	Male	15	37.5	20	50.0		
Marital Status	Married	32	80	35	87.5	0.367	0.544
	Single	8	20	5	125		
Smoking	Yes	7	175	6	15	0.000	1.000
	No	33	825	34	85		
Alcohol Use	Yes	1	25	0	0	Fisher's Exact	1.000
	No	39	975	40	100		
Educational Status	Elementary	15	375	23	575		
	Secondary	7	175	8	200		
	High-school	12	300	5	125	4.811	0.090
	University	6	150	4	100		
Occupation	Not working	4	100	7	88		
	Housewife	19	475	36	45		
	Blue-collar	1	25	1	12		
	White-collar	1	25	1	12		
	Self-employed	5	125	5	63	- n	-
	Retired	10	250	30	37.5		
Economic Status	Good	5	12.5	6	13.7		
	Average	33	82.5	26	81.3		
	Poor	2	5	2	5	-n	-

n= Statistical analysis could not be made due to the lack of count in the cell.
U=Mann-Whitney U, X2= Chi-square.

Table-2: The Scale for Perception of Health in Haemodialysis Patients (SPHHP) and the Scale for Complaints/Symptoms in Haemodialysis Patients (SC-SHP) Scores' Inra-Group Differences in First and Final Interviews in the Experimental and Control Groups (n=40).

Scale Scores	Median (IQR)	Min	Max	Wilcoxon Signed Rank Test
Experimental Group				
SPHHP				
First interview	43(38.82)	21	51	Z= -1.778
Final Interview	43 (32.38)	27	52	P= 0.075
SC-SHP				
First interview	45.5 (42.22)	29	62	Z= - 3.851
Final Interview	39.33 (38.75)	27	51	P= 0.000***
Control Group				
SPHHP				
First interview	43 (38.45)	22	58	Z= -4.554
Final Interview	47.5(50.41)	27	52	p= 0.000***
SC-SHP				
First interview	41.5(30.59)	30	56	Z= -1.260
Final Interview	44(33.75)	24	59	p= 0,208

Z= Wilcoxon sign test.

Table-3: The Scale for Perception of Health in Haemodialysis Patients (SPHHP) and the Scale for Complaints/Symptoms in Haemodialysis Patients (SC-SHP) Scores Differences in the First and Final Interviews between the Experimental and Control Groups (n=80).

Scale Scores	SPHHP Median (IQR)	SC-SHP Median (IQR)
First interview		
Experimental Group (n=40)	43 (38.45)	45.5 (44.43)
Control Group (n=40)	43 (42.55)	41.5 (36.58)
Significance	U= .718	U= .643
	p= 0,429	P= 0.131
Final Interview		
Experimental Group (n=40)	43 (29.29)	38 (30.59)
Control Group (n=40)	47.5 (51.71)	44 (50.41)
Significance	U= 351.5	U= 403.5
	p= 0.000***	P= 0.000***

U=Mann Whitney- U test.

groups. There was no statistically significant difference in age, gender, marital status, educational status, occupation, and primary kidney disease between the groups (p>0.05) (Table-1). In the experimental group, 25(62.5%) patients stated that they did not receive extensive information about their disease and HD, whereas this ratio was 24(60%) in the control group. It was found that 15(37.5%) subjects in each group received information from the nurse.

In the experimental group, there was no significant difference in SPHHP scores between the first and final interviews (p>0.05), whereas the SC-SHP scores were significantly different (Table-2). In the experimental group, the SC-SHP scores were positively lower in the final interview compared to the first interview (p<0.001). In the control group, there was no significant difference in SC-SHP scores between the first and final interviews (p>0.05), whereas the SPHHP scores were significantly different (p<0.001). There was no significant difference in the SPHHP and SC-SHP scores between the groups in the first interview (p>0.05), whereas a significant difference was found in the final interview. The scores of the control group were poorer compared with the experimental group in the final interview (p<0.001 and p<0.001) (Table-3).

Table-4: Blood Electrolytes Levels of the Experimental and Control Groups in First and Final Interview, and Inter-Groups Differences (n=80).

Variables	First Experimental Group Mean±SD	Interview Control Group Mean±SD	Final Experimental Group Mean±SD	Interview Control Group Mean±SD
Sodium (mmol/L)	137.15 ± 15.8	136.55 ± 2.75	139.80 ± 2.32	140.95 ± 3.61
Inter-Groups differences	U=275.5 p=0.001**		U=558.5 p=0.000***	
Calcium (mmol/L)	9.26 ± 1.02	11.14 ± 15.08	9.61 ± 0.93	8.77 ± 0.90
Inter-Groups differences	U=467 p=0.000***		U=275.5 p=0.000***	
Phosphorus (mmol/L)	6.19 ± 7.53	4.93 ± 1.31	4.96 ± 0.82	5.25 ± 1.30
Inter-Groups differences	U=761 p=0.707		U=657 p=0.169	
Potassium (mmol/L)	5.53 ± 0.72	4.95 ± 0.48	5.60 ± 0.73	5.28 ± 0.73
Inter-Groups differences	U=421 p=0.000***		U=562.5 p=0.022*	
Haemoglobin (g)	10.86 ± 1.31	11.17 ± 1.60	11.61 ± 1.08	10.02 ± 1.27
Inter-Groups differences	U=752.5 p=0,647		U=278.5 p=0.000***	
Haematocrit (%)	33.15 ± 4.10	31.93 ± 4.94	34.80 ± 3.58	29.91 ± 4.35
Inter-Groups differences	U=622.5 p=0.088		U=314 p=0.000***	
Interdialytic weight (IDWG)	2.33 ± 1.10	2.66 ± 01.06	1.80 ± 0.89	2.74 ± 0.86
Inter-Groups differences	U=467 p=0,174		U=348.5 p=0.000***	
Pre-dialysis systolic blood pressure (mm/Hg)	118.00 ± 21.63	126.75 ± 10.71	120.00 ± 16.95	129.75 ± 12.91
Inter-Groups differences	U=519 p=0.006*		U=429.5 p=0.000***	
Pre-dialysis diastolic blood pressure (mm/Hg)	71.50 ± 13.69	80.25 ± 6.98	70.25 ± 12.09	76.2513.28
Inter-Groups differences	U=416.5 p=0.000***		U=554 p=0.013*	

*p<0.05, **p<0.01, ***p<0, U= Mann-Whitney U test.

In the first interview, there was no significant difference in serum phosphorus levels and IDWG between the two groups ($p<0.05$), whereas sodium, calcium, potassium, and systolic and diastolic blood pressures were significantly different ($p<0.05$ each). In the first interview, the serum levels of sodium and potassium of the experimental group were higher and the calcium level was lower than the control group (Table-4).

In the final interview, there was no significant difference in serum phosphorus levels between the two groups ($p<0.05$), whereas sodium, calcium, potassium, IDWG, and blood pressures were statistically significantly different ($p<0.05$ each). In the final interview, the serum sodium levels, IDWG, and blood pressures of the experimental group were lower than the control group, whereas the calcium and potassium levels were higher.

Discussion

The present study, which was conducted to establish whether case management had an effect on health perceptions and symptom relief in HD patients, included a sample group with 40 experimental group patients and 40 control group patients. The groups were similar in terms of sociodemographic features. The similarity of two groups in terms of sociodemographics as the independent variable is important for demonstrating the efficacy of case management, which is the dependent variable.

Case management is a cost-efficient method that has become popular in healthcare in recent years. With the relevant guidance, reduced IDWG and improved compliance with fluid restriction were observed.[12] In another study, the level of information of ESRD patients increased by 66-90% after face-to-face guidance. The findings suggest that education is required for better patient outcomes and disease management.[21] A study used case management through the Rightstart education programme in a group of patients and made an assessment in months 1, 3, 6, and 12. The results revealed an increase of 56-81% in the patients' level of information.[22] No study was identified in the literature that investigated the effect of case management on the health perceptions and the complaints/symptoms.

The present study's findings about SPHHP and SC-SHP scores were similar to earlier findings in literature.[23,24]

The present study found that more than half of the patients had not received adequate education about HD. This result may be considered an indication that HD patients do not receive adequate education about the disease or the treatment. In a previous study, patients were provided with guidance on chronic renal failure at months 0, 6, and 12, and the level of information increased in month 6 and reduced in month 12. Therefore, the study concluded that the haemodialysis patients should be followed-up for a maximum period of six months and the education should be repeated.[13] When HD patients are not provided with adequate education, the patients face difficulties in dealing with the problems that arise and experience more complaints, leading to increased potential risks. The effect of regular patient education and the case management for the patient follow-up emerges at this point.

It has been demonstrated in the literature that patient education and follow-up is important for disease management, symptom control, and minimising existing or potential risks, which has positive effects on the laboratory results of the patients.[12,21,25] The present study found lower serum sodium levels, IDWG, and blood pressures in the experimental group compared to the control group in the final interview. With case management, compliance with salt and fluid restriction would be possible, and accordingly, a reduction in IDWG and blood pressures could be achieved in HD patients.

Recent studies have established a strong correlation between fluid retention and mortality. Fluid retention may cause IDWG and conditions such as oedema of the lower extremities, anasarca, pulmonary congestion, oedema, hypertension, and heart failure. Therefore, fluid management emerges as an important topic in ESRD patients.[26] The study by Zadeh et al. monitored 34,107 patients for 13 weeks and 29,207(86%) of these patients had IDWG >1.5kg.[26] It was revealed that the patients with IDWG >3kg, in particular, had higher mortality risk, and the mortality risk of the patients with IDWG >4kg increased by 28% compared to those with IDWG between 1.5 and 2 kg. It was seen that the sodium level of the experimental group was within normal values according to the KDIGO guideline.[27] Considering that the elevated sodium levels cause increased IDWG and therefore hypertension and oedema, it can be said that this is a satisfactory result. Keeping IDWG under control using case management can be expressed as a result that should be considered in terms of avoiding risks.

In the study, which was conducted with patients at a dialysis centre regarding the presence, frequency, and severity of the symptoms, the most common complaints of the patients were fatigue, sleep

problems, pruritus, skin dryness, drowsiness, and bone pain.[25] These complaints resulted from the imbalance in the laboratory findings, such as phosphorus, sodium, and parathormone, which increase the risk level of the patients. Therefore, patient follow-up with case management and laboratory result monitoring can be considered important for improving their motivation and the balance of the values.

Previous studies have established a high correlation between increased dietary potassium intake and high potassium levels. Mortality risk increased relatively in patients with a level of potassium >6 mEq/l.[28] Accordingly, it is important to maintain the potassium level within normal limits in terms of mortality risk, and it may be concluded that case management helps achieve the target value at this point. The present study found higher serum levels of calcium and potassium in the experimental group compared to the control group in the final interview. However, such an increase in the serum levels of calcium and potassium was not above the reference values and therefore, does not have much meaning in clinical terms.

In the first interview, there was no significant difference in health perceptions and complaints/symptoms between the experimental and control groups. In the final interview, the experimental group had significantly reduced complaints/symptoms after three month's of case management compared with the control group. In the control group, there was no significant change in complaints/symptoms in the final interview, but the health perception increased negatively. In the experimental group, which was followed-up through case management, a significant reduction was achieved in serum levels of sodium, IDWG, and blood pressures.

The main limitation of this study is smaller sample size. The sample could have been larger had it not been for the short duration.

Conclusion

It is recommended that nurses should use case management with a holistic approach to improve health perceptions and the managements of the patients' complaints/symptoms at haemodialysis centres. Additionally, we recommend using SPHHP to evaluate health perceptions and SC-SHP to evaluate complaints and symptoms of the patients.

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