The Relationship Between Social Support and Adherence of Dietary and Fluids Restrictions among Hemodialysis Patients in Iran

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ARTICLE INFO	ABSTRACT
	Introduction: Patient's noncompliance dietary and fluids intake can lead to a build-up of toxic fluids and metabolic end-products in the blood stream which may result in an increased morbidity and premature death. The aim of the study is investigate relationship between the social support and adherence to dietary and fluid restrictions in hemodialysis patients. *Methods:* In this correlational study upon 237 hemodialysis patients, the data was collected with the dialysis diet and fluids non-adherences hemodialysis questionnaire (DDFQ), and the multidimensional scale of perceived Social Support (MSP). Interdialytic weight gain, predialytic serum potassium levels, and predialytic serum phosphate levels was considered as biochemical indicators of dietary and fluid adherence. Data were analyzed by SPSS Ver.11.5. *Results:* About 41.1% of patients reported non-adherence to diet and 45.2% of them reported non-adherence to fluid. Frequency of non-adherence to fluid was more common in patients. The highest level of perceived support was the family support 11.19 (1.34). There was a significant relationship between social support and adherence to dietary and fluid restrictions. Noncompliances to dietary and fluid restrictions were related to laboratory results. *Conclusion:* This way those patients who more supported had more adherences of diet and fluid restrictions and had lower level of phosphorus and potassium in laboratory results. Nurses have the main role to identify different methods providing social support for patients, also to encourage the families to support their hemodialysis patients.

Introduction

Chronic Kidney Disease (CKD) as a public health problem is considered endemic across cultures globally.[1] Hemodialysis patients have many problems resulting from the disease itself and treatment process, which change their quality of life, cause depression, and sometimes even lead to suicide and early death.[2] The prevalence of CKD stages 1 to 4 increased from 10.0% in 1988-1994 to 13.1% in 1999-2004 in the USA.[3] Evidence suggests chronic renal failure has a high prevalence in

Iran.[4] In Iran, the prevalence of CKD, stages 3 to 5, in a population based study was 14.9% in 2009.[5]

Chronic renal failure involves the patients and their families due to the extensive lifestyle changes, as well as fluid and dietary restrictions.[6] The successful treatment of patients with end stage renal failure requires adherence to complex, whole of lifestyle changes, and lack of compliance with diet and fluid restrictions may lead to accumulation of metabolic by products and excess fluid in the circulatory system, leading

to increased morbidity and mortality for renal failure patients.[7]

Low adherence to dietary treatment is a significant health problem that reduces the benefits of routine treatments, exacerbates symptoms, reduces quality of life for the patient, as well as increasing costs to both the patient and the health system. Poor compliance has been estimated to cost between 100 to 300 billion dollars in the United States.[8,9] Identify factors influencing adherence to treatment regimens are one of the goals of public health, which it has been declared as an objective of the Healthy People 2010.[10]

Adherence to diet and fluids and dialysis is the cornerstone of renal failure treatment.[2] Following recommended treatments (diet and fluid restriction) by the patient is one of the most important issues in the health care programs.[2] We suggest our hemodialysis patients to be educated to follow a proper schedule for their adherence to dietary and fluid restrictions, as well as necessary medications. Therefore the nurses should identify the conditions and factors related to adherence to dietary treatment in hemodialysis patients while keeping them under close observation.[11]

The social support means providing physical and emotional support by family member and providing professional help or community support group.[11] Having access to social support, be it from the spouse, family members, friends, colleagues or the community, has been consistently linked to better health outcomes for patients with various chronic illnesses.[12] The adherences to dietary and fluid restrictions as well as medical treatment are important parts of complex and difficult treatment process in these patients.[13] Compared with chronic illnesses like cancer or cardiovascular disease, there is a paucity of research addressing the association between social support and mortality rates and adherences to dietary and fluid restrictions in dialysis patients.[12] The results of the some studies show that the social support is one of the factors, which may improve patient's quality of life.[14]

Studies by Kimmel et al., in 1995 and Moran et al., in 1997 have illustrated that there is no significant relation between the social support and adherence to recommended dietary treatment.[15,16] However, other study by including that of Kara et al., in 2007 have confirmed the relation between social support and adherence to recommended dietary treatment.[11] Understanding how having social support at the start of dialysis treatment is associated with survival and well-being may have important clinical benefits for this patient population as it can inform clinical practice for the promotion or improvement of patients' support networks.[12]

After reviewing the sources, we found no study about the relation between social support and adherence to a dietary or fluid restriction in hemodialysis patients in Iran. We observed a significant difference in adherence-related factors among Iranian and other countries, such as different healthcare system, social support and nursing care management. For example, in Iranian health care system, nursing care is limited to the hospital, and home visits are not common for treatment or follow-up. Thus, the findings of some published studies never imply to the current system of Iran.[17] Considering the importance of this broad subject, we conducted a study about the relationship between the social support and adherence to dietary and fluid restrictions in patients undergoing hemodialysis treatment in Iran.

Materials and methods

This is a correlational study performed in two large hemodialysis centres in eastern region of Iran in 2010. The study group included the patients attending in either of these two centres. The including criteria were minimum age of 18 and a history of receiving hemodialysis at least for three consecutive months. Patients were aware of their

treatment regimen. The excluding criteria were physical disabilities and mental disorders. Then, α level of 0.05, a power of 0.90 and pq=0.192 were used for sample size determination. Therefore, a sample size of 250 was calculated. A total of 273 patients who were assigned as our study group based on standards according other published studies.[7,11,16] Every participant answered the following three questionnaires through a 20-minute interview: personal data questionnaire, dialysis diet and fluid non-adherence questionnaire (DDFQ), and multidimensional scale of perceived social support (MSP). Personal data questionnaire includes information, like age, gender, marital status, history of patient, including weight before and after dialysis, and finally laboratory reports, such as rate of phosphorus; potassium; and serum albumin. DDFQ was designed by Vlaminck et al., (2001) in order to assess the behaviours related to adherence to diet and fluid limitations in hemodialysis patients; in addition, its reliability has been confirmed for the patients under hemodialysis treatment.[18]

This questionnaire consists of four subscales with two questions regard non-adherences to diet (frequency and severity), and the other two questions are about non-adherence to fluid. The severity of non-adherence is scored on a 5- point Likert scale from 0 (no) to 5 (very severe). The frequency of non-adherence is evaluated for two consecutive weeks. This questionnaire was translated into Persian for the first time and used in this research. The translation of the questionnaire was done using forward-backward translation technique. First, the questionnaire was translated from English to Persian by a researcher and an expert nurse. Then, the Persian version was reviewed by an expert with PhD degree in English Literature, a nurse with PhD degree, and an instructor specializing in English for medical sciences. Next steps, two separated copies in English (original and the re-translated copy in English) were compared, and final form in

Persian was also approved by three skilled nurses and one nutritionist. The reliability of final copy was also confirmed using the Cronbach's alpha of 0.71. The correlation between non-adherences variables as well as biochemical and biological factors were used as a measure of validity. Therefore, the translated form of this questionnaire had sufficient validity and reliability to be applied in the present study.

MSP questionnaire includes 12 questions assessing perceived social support of individuals from family, friends, and significant others. The original questionnaire designed by Zimet et al.,[19] is a 12-item scale, and each item is scored based on 7-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree). The score for each subscale ranges from 4 to 28, so total score of questionnaire is 84. Higher scores indicate higher levels of perceived social support. Present scale was used by Barutcu[20] for chronic illness such as heart failure and in this study present scale was adapted for Iranian people with 3- point Likert scale (yes=1, no=2, I am not sure=3). The score of each subscale is ranged from 4-12, so total score is 36. In order to determine the validity and reliability of this questionnaire, we applied content validity method and Cronbach's alpha (0.84), respectively.

In univariate analysis, Spearman's correlation coefficient was used to evaluate the association between non-adherence to fluid and dietary factors as well as other continuous variables. The Chi-square test was applied to assess the association between ordinal variables. To perform multivariate logistic regression, we considered degree of non-adherences to dietary and fluid as dependent variables, while in order to have cut-off point, scores 0 and 1 (no deviation and mild deviation) were considered as adherence, as well as scores 2 to 5 (moderate to very severe) were known as non-adherences. To control the possible confounding factors, and to identify independent risk factors for non-adherence to

dietary and fluid, multivariate logistic regression, adjusted odds ratios (ORs), and 95% confidence intervals (CIs) were carried out for this study. Those variables with value of P<0.2 in univariate analysis were included in the backward step wise model. All statistical analyses were performed using SPSS version 11.5 (SPSS Inc., Chicago, IL, USA). A two-tailed P<0.05 was considered statistically significant.

The ethical approval for this study was obtained from the Research Ethics Committees of Gonabad University of Medical Science. The participants were informed about the aim and method of the study, also they were told their participation was voluntary, and they had the right to withdraw at any point. Participants were informed regarding anonymity and confidentiality of the data. Signed consent forms were obtained from those who agreed to participate in this study.

Results

From 273 patients, 157 (57.5%) men and 116 (42.5%) women participated in this study. Of 273 individuals, 30 (11%) single and 243 (89%) married were identified. Mean age of patients was 46.1(15.4) (Range: 18-84, IQR: 34.5, 56.5). The descriptive statistics of MSP scores, biochemical values, and day frequency of non-adherence to dietary and fluid are summarized in Table 1.

Median frequency of non-adherence to dietary and fluid was 4 and 8 days, respectively. The degrees of non-adherence to dietary and fluid are shown in Figure 1.

The patients averagely gained 1.5 Kg of weight between two consecutive dialyses. There was no differences between men and women in terms of non-adherence to dietary (P=0.4) and fluid (P=0.6). About 87.5% single and 46.2% married patients had non-adherence to dietary, and this difference was statistically significant (P=0.02). There were also 100% single and 49.2% married patients who had fluids non-adherence (P=0.007).

Table 2 shows the correlation between non-adherence of variables and age, weight gain and biochemical factors. It reveals that increase in age significantly decreases the level of non-adherence. On the other hand, there were significant, moderate and positive correlation between degree and frequency of non-adherence as well as inter-dialysis weight gain. The frequency and degree of non-adherence were also significantly and positively correlated with serum albumin, phosphorus and potassium (P<0.05). The correlation between non-adherence variables and social support components are shown in Table 3. The degree and frequency of non-adherence are correlated negatively with total social support, family support, friend support and other significant supports (medical personnels, charity, or religion) (P<0.001).

Multivariate analysis showed that most important factor on non-adherence to dietary was found to be other significant supports (Adjusted OR=0.31, 95%CI: 0.18, 0.52). In addition, most important factors affected non-adherence to fluid were other significant supports (Adjusted OR=0.51, 95%CI: 0.32, 0.8) and friends support (Adjusted OR=0.67, 95%CI: 0.49, 0.92).

Discussion

The results of the present study showed that most of the patients have had a moderate rate of nonadherence to dietary and fluid restrictions. Kuglar et al., in 2005 and Kara et al., 2007 have reported that hemodialysis patients have a weak adherence to dietary and fluid restrictions.[11,13] Non-Adherence to fluid limitation in hemodialysis patients is one of the stressful aspects in the treatment of these patients.[11]

The frequency of Adherence to fluid was common in the patients as they reported averagely 8 days deviation from their fluid guidelines in the past 14 days. One of the reasons of this deviation could be the habit of drinking tea among Iranian people. Patients in this study, in average, had low levels of social support.

Table 1. Mean and standard deviation and quartiles of MSP scores, biochemical values, and day frequency of diet and fluids non-adherence

| Variables	Mean (SD)	IQR*
Social support	28.35 (4.88)	24.5, 32
Significant others support	9.92 (2.08)	8.5, 12
Family support	11.19 (1.34)	10.5, 12
Friends support	7.24 (2.65)	5, 9
Inter-dialytic weight gain (kg)	1.49 (0.71)	1, 2
Serum albumin (g/dl)	4.09 (0.36)	3.86, 4.34
Phosphorus (mg/dl)	6.37 (1.7)	5.25, 7.4
Potassium (meq/l)	4.76 (0.75)	4.3, 5.3
Day frequency of diet non-adherence	5.27 (4.27)	2, 7.5
Day frequency of fluids non-adherence	8.04 (4.83)	4, 14

*Inter-quartile range (25, 75)
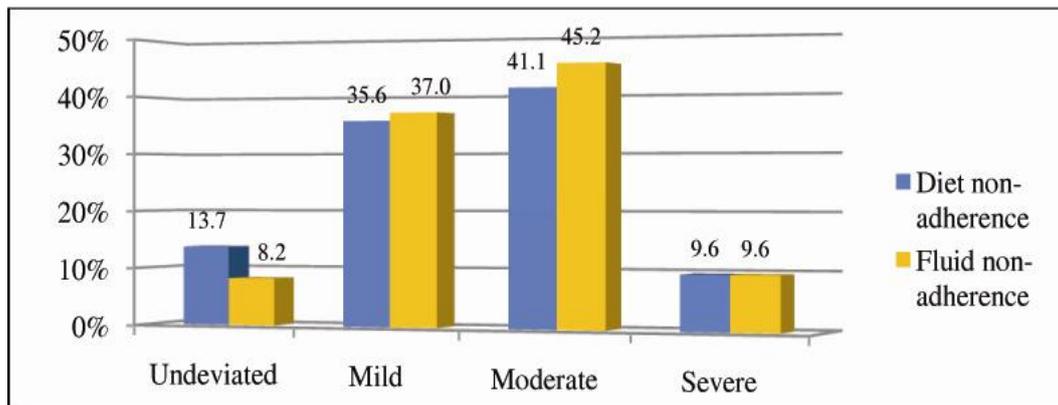
Figure 1. The degree of fluids and diet non-adherence in hemodialysis patients

Table 2. The correlation of non-adherence variables with age, weight gain and biochemical factors by spearman's rho

Variables	Statistical indicators	Age	Inter-dialytic weight gain (kg)	Serum albumin (mg/dl)	Phosphorus (mg/dl)	Potassium (meq/l)
Day frequency of diet non-adherence	r	-0.266	0.562	0.292	0.789	0.357
	p	0.023	<0.001	0.012	<0.001	0.002
Degree of diet non-adherence	r	-0.317	0.518	0.319	0.651	0.324
	p	0.006	<0.001	0.006	<0.001	0.005
Day frequency of fluids non-adherence	r	-0.275	0.669	0.306	0.623	0.331
	p	0.019	<0.001	0.009	<0.001	0.004
Degree of fluids non-adherence	r	-0.241	0.575	0.338	0.537	0.277
	p	0.040	<0.001	0.003	<0.001	0.017

Table 3. The correlation between non-adherence variables and social support components by Spearman's rho

Variables	Statistical indicators	Social support	Significant other supports	Family support	Friends support
Day frequency of diet non-adherence	r	-0.848	-0.796	-0.592	-0.649
	p	<0.001	<0.001	<0.001	<0.001
Degree of diet non-adherence	r	-0.654	-0.643	-0.468	-0.464
	p	<0.001	<0.001	<0.001	<0.001
Day frequency of fluids non-adherence	r	-0.802	-0.715	-0.469	-0.679
	p	<0.001	<0.001	<0.001	<0.001
Degree of fluids non-adherence	r	-0.672	-0.593	-0.438	-0.536
	p	<0.001	<0.001	<0.001	<0.001

Also the family was introduced as one of the most important supportive sources by these patients; whereas, the rate of support was perceived
by friends were so slight. Similar results have been observed in a study conducted by Pang et al., in 2001 and Asti et al., in 2006.[21,22]
The hemodialysis patients with regard to the type of their disease are entangled in conditions which have impact on their relationship with other individuals.[23]
The results suggest that increase in age decreases the level of nonadherence. Older people are more conservative and may have more compliance in comparison with younger ones. There were significant, moderate to positive correlation between degree and frequency of nonadherence, as well as interdialytic weight gain, serum albumin, phosphorus, and potassium. Vlaminck et al; used these biochemical values as the gold standard measurement of nonadherence.[18]
In our study, comparing the test values of the DDFQ with biochemical and biological variables confirm criterion validity of DDFQ. Kara et al., in 2007 and Kugler et al., in 2005 presented the similar results.[11,13] They declared that nonadherence to dietary and fluid limitations lead to the accumulation of nitrogen materials and electrolytes in the patient's body. Also, increase volume of fluid

consumpted by hemodialysis patients leads to increase of weight in patients, so affectstheir biochemical laboratory results.[11,13]
The findings of current study show that the patients with higher level social support had a higher level of adherence to dietary and fluid restrictions. The most important factor on diet non-adherence was found to be significant for other supports (medical personnels, charity, or religion) , while the most important factors affected non-adherence to fluid were significant for other support (medical personnels, charity, or religion) and friends support. Researchers believe these results are due to the strong support of the health system and providing medical and psychological supports from health care providers. Since hemodialysis patients need special care due to their special conditions, they need specific health care providers. Also, Sayers et al., in 2008 suggests that family members should play a greater part in improving self-care behaviours.[24]
The results of Osborn et al., in 2012 has showed social support in diabetic patients can reduce the negative effects of depression on adherence to treatment regimen.[25] The patients under the treatment of hemodialysis have introduced the family as their most important supportive resources. We believe these results may be due to the Iranian culture in which they consider the family

members as their most important support. Kara et al., in 2007 have also reached such findings in their study.[11] Often a family memeber appears as a counselor, who encourages patient to further adhere to their treatment regimen and to make neccessary adaptation to the disease.[26] Social support in patients with heart failure can lead to improve or to maintain health-related quality of life.[27] Janowski et al., have found that the patients with higher social support levels had significantly higher quality of life, lower depression levels, and higher acceptance of life with psoriasis.[28] Gallagher et al., have concluded that heart failure patients with high score of social support had more adherence to self care behaviors compared to patients with moderate and low social support.[29] Song et al., have also found that social support is an important factor in self-care behaviors in patients with type 2 diabetes.[30] Effective support from a close friends can reduce stress and depression of a patient, also encourages him to accept treatment.[11]

The findings of current study show that the patients receive a low support by the friends. One of the reason can be the nature of this disease which has impact on the relationships of the individual.[23] Other studies have showed that social support is effective in improving the quality of life and reduce stress of hospitalizations in patients,[31] moreover, low social support may lead to increase of mortality in dialysis patients.[32]

It should be considered, the social support as well as adherence of diets and fluids are processes that constantly changing. So, we assume this as limitation of the present research.

Conclusion

The results of this research showed that there is an important relation between the social support, as well as adherence to dietary and fluid restrictions among the hemodialysis patients. Though, the family has been introduced as one of the most important supportive resources for patients. With regard to the relation between adherence to dietary and fluid restrictions, as well as social, friend, and other supports (medical personnels, charity, or religion) in hemodialysis patients, the nurses and other health system personnel should find strategies to enhance communication with patinet to help them maintaining their treatment regimen, and to encourage family member, friend and significant others to involve in treatment process. Moreover, efforts should be made to prepare more effective supports for the hemodialysis patients. Perhaps, educating families of patients is one of useful approaches to provide this support.

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Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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