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Original Article

Self-Care and Its Predictive Factors in Hemodialysis Patients

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Abstract

Introduction: Chronic kidney disease is a serious problem and patients need active self-care. This study focuses on the relationship between self-care and its predictive factors in hemodialysis (HD) patients.

Methods: This multicenter correlational study was conducted on 201 HD patients referring to HD centers in the west of Tehran, Iran. A multi-stage sampling method was used to select the samples. Data were collected using self-care Scale, Paloutzian-Ellison Spiritual Well-Being Scale, and Connor Davidson Resilience Questionnaires. Data were analyzed using SPSS software version 13 and descriptive statistics and linear regression with stepwise method.

Results: The mean (SD) scores of self-care, resilience, and spiritual well-being were 35.5 (5.69), 53.4 (12.94), and 97.4 (17.9), respectively. Univariate analysis showed that self-care had a statistically significant relationship with gender, occupation, education, being diabetic, and hyperlipidemia. Self-care positively correlated with the resilience and negatively correlated with age. Multivariate regression indicated that the resilience (β=0.78, $P=0.001$), being diabetic (β=-0.09, $P=0.01$), and age (β=-0.11, $P=0.005$) could be predictors of self-care. These variables accounted for 78% of variance in self-care in HD patients.

Conclusion: Our results showed that resilience was positively correlated with self–care, but being diabetic and age were negatively correlated with self-care in HD patients. Therefore, the health care providers should pay more attention to HD patients who are diabetic and older, as they are at a higher risk of having impaired self-care.

Introduction

Chronic kidney disease (CKD) is a serious disease with considerable health consequences.[1] The most common treatment that alleviates the symptoms and rescues the patients' life is HD.[2] The prevalence of CKD is increasing in the world for many reasons.[3] An annual growth of 5-6 percent in the CKD compared to population growth has been a challenge in all countries around the world. This growth rate in Iran is higher than the average global rate.[4]

Self-care is an important component of health care research, because it enhances patients' capability to cope with the consequences of chronic conditions.[5] The CKD patients are facing complex treatment regimens and physical, psychological, and social limitations.[6] Self-care plays a key role in the disease management.[7] Self-care activities can improve the self-efficacy and performance status to high level, which in turn reduce the complications of chronic disease.[8] It also improves the quality of life and coping capability, reducing the frequency and length of hospitalization, medical costs and mortality rate in HD patients.[9,10,11] In a study in Colombia, 60% of patients had sufficient self-care abilities.[12] In Turkey, HD patients had a moderate level of self-care ability and the self-care capability of such patients has been reported desirable in Iran.[6,13]

The presence of a chronic disease is a significant potential threat.[14] Resilience can help HD patients to cope with these threats.[15] Resilience is a concept used to describe a person's capacity to overcome difficulties.[16] In a study by Hajmohammadi and Shirazi in Iran, the resilience in HD patients was reported to be at a moderate level, which can be increased by self-care education.[17,18]

Resilience and spiritual well-being has been shown to be interrelated with each other.[19] Kavak et al., showed that when the level of spiritual well-being was enhanced in cancer patients, there also seemed to be a corresponding increase in their psychological resilience.[20] Spirituality plays an important role in coping with the immediate and long-term consequences of stressful situations in most people.[21] Spirituality/religion can serve as an incentive for treatment adherence and self-care.[22] Loureiro et al., state that spiritual well-being is related to mental and physical health in HD patients.[23] The spiritual well-being leads to maintaining and improving the patient's self-esteem,

creating sense of purpose, meaningful life and increasing mental health in HD patients.[23] Taheri Kharameh et al., reported that spiritual well-being in HD patients had a desirable level.[24] However, Reig-Ferrer et al., noted that spiritual well-being in HD patients was at a low level.[25] According to the study by Pilger et al., the quality of life in HD patients was associated with spiritual well-being in older adults, either positively or negatively.[26]

Resilience and spirituality have close relationships with culture and life style in different communities.[27] Resilience is a new concept in chronic conditions and may have an active role in disease management and clinical outcomes in HD patients. The relations between spirituality and resilience and their association with self- care in HD patients have not been adequately studied by now. So this research can provide a new insight into the self-care behaviors and the concepts of resilience and spirituality. Chronic diseases affect both the patients' physical and spiritual well-being. To better understand the importance of spirituality/religion and resilience as a source of strength among HD patients, comprehensive research studies are necessary. This study evaluated the self-care and its predictive factors in hemodialysis patients.

Materials and Methods

The study was approved by the ethics committee of Kashan university of medical sciences (ethical code: 4228). A correlational research design was used in this study. The study population included patients referring to dialysis centers located in the west of Tehran City/ Iran, from Dec. 2015 and Sep. 2016. A multi-stage sampling method was used to recruit the study sample. The sample size was calculated 198, using the correlation formula with the power of 0.9 and confident coefficient of 95% and r= 0.285.[28,29] Cluster random sampling was used to select four dialysis centers from the west of Tehran (Imam Sajjad Hospital in Shahryar, Hazrat-e Fatemeh Hospital in Robat Karim, Imam Ali in Qods town and Soodeh in Islamabad). Hemodialysis patients were selected, using a consensus sampling method. In each of selected centers there were 85, 60, 55 and 95 HD patients. A total number of 201 patients who had met the inclusion criteria were included the study. The inclusion criteria were being over 20 years of age, having undergone HD for at least 3 months, having the ability to answer the questions and consenting to participate in the study. Patients who had had transplants, been hospitalized, or had history of known mental diseases were excluded from the study. The participants were identified through lists provided by HD centers. The permissions for sampling and data collection in the HD centers were obtained. All patients who participated in this study received study information and provided written informed consents. The researcher completed the questionnaires during HD sessions. Initially, the researcher explained the study's aims and invited the patients to participate. The items of the questionnaire were read out by the researcher face-to-face to the patients whose clinical condition was stable enough to participate, and who signed the written consent forms. The researcher had prior experience of working in HD unit.

The data were collected, using socio-demographic and clinical characteristics questionnaire, Self-Care Scale, Paloutzian-Ellison Spiritual Well-Being Scale,[30] and Connor Davidson Resilience Scale (CD-RISC).[31]

The socio-demographic and clinical characteristics questionnaire included variables such as age, gender, occupation, economic status, level of education, marital status, duration with HD(year), history of kidney transplantation, chronic diseases, and frequency of dialysis sessions per week.

Self-care scale is a researcher made 33-items tool to measure self-care in HD patients, and had been designed based on review articles. It is comprised of four subscales: 1-self-care of arteriovenous fistula (AVF) with 12 items (answered as yes, no), 2- skin itching with 7 items (answered as yes, no), 3- adherence to diet with 8 items (answered as yes, no) and 4- general-care with 6 items (answered as never, sometimes, most often or always). The negative items (4, 5, 6, 12, 13, 20, 26 and 27) were reversely coded for analysis. The total score of the self- care scale ranged from 0 to 45 interpreted as: low (0 to 15), moderate (16 to 30) and high (31 to 45) self-care in patients. Higher score represented higher self-care. The Cronbach's alpha coefficient for the self-care scale was determined as 0.87. The Cronbach's alpha coefficients were determined for subscales of AVF= 0.83, skin itching= 0.88, adherence to diet= 0.80, general-care= 0.79. The reliability of the scale was evaluated through test-retest method which resulted in correlation coefficient of 0.89.

Spiritual Well-being Scale is a 20-item questionnaire developed by Paloutzian-Ellison (1982). The scale consists of 10 items on religious well-being (vertical dimension) and 10 items on existential well-being (horizontal dimension). The total score of the questionnaire is the sum of the scores of two sections. Higher total score indicated higher spiritual well-being. The items of the questionnaire were scored based on a six-point Likert scale. Scores are from 1 to 6 as: strongly disagree, disagree, slightly disagree, slightly agree, agree, strongly agree. In questions 3, 4, 7, 8, 10, 11, 14, 15, 17, 19, 20, the state of completely disagree was scored as 1 and in questions 1, 2, 5, 6, 9, 12, 13, 16, 18, completely disagree was scored as 6.The total score ranged from 20 to 120 which was interpreted as: low (20-40), moderate (41-99), and high (100 to 120) levels of spiritual well-being.

In the Persian version of this questionnaire Cronbach's alpha coefficient for total scale were calculated 0.85.[32] In this study the Cronbach's alpha coefficients for the spiritual well-being scale and the two subscales (religious well-being and existential well-being) were 0.89, 0.84, and 0.87, respectively. The test-retest reliability was calculated 0.81.

The Connor-Davidson Resilience Scale (CD-RISC) is a 25-items scale and all items are scored on a 5-point Likert scale (0= false to 4= always true). The total score of the questionnaire ranges from zero to 100. Higher total score indicates a higher level of resilience.[31] The Persian version of the CD-RISC was validated by Alhosseini Almodarresi & Firouzkouhi Berenjabadi and its reliability was assessed through the internal consistency method with a Cronbach's alpha of 0.89.[33] In this study, Cronbach's alpha coefficient was calculated 0.91.

Data were analyzed, using SPSS software ver.13 (SPSS Inc., Chicago, IL). The Kolmogorov-Smirnov test was used to assess the normality. Patients' demographic and clinical data were presented, using descriptive statistics such as mean, standard deviation, and frequency tables. In univariate analyses, independent t-tests and one-way ANOVA were used for qualitative variables, and Pearson correlation for quantitative variables. In multivariate analyses, linear regression with method stepwise was used to determine predictive factors of self-care. At this stage, variables with $P \leq 0.2$ entered the model. The level of significance was set at $P < 0.05$.

Results

The participants were 21-87 years old with the mean age of 53.4 (12.8). Most of the participants were female (%56.7), married (%76.5) and had the educational level of lower than diploma (%69.7). The results indicated that most of the participants had 3 times a week of HD sessions and had a history of hypertension (Table 1).

Table 1 shows the differences in self-care according to demographic and clinical characteristics. A significant difference was found between gender (t= 2.51, P= 0.01), occupations (F= 4.89, P= 0.003), education (t= -4.27, P= 0.001), diabetes (t= 6.12, P= 0.001) and hyperlipidemia (t= 6.69, P= 0.001). Self-care was higher in men than in women. A significant difference was also observed in the self-care of patients with different educational levels; literate patients showed higher self-care than illiterate patients. The results of the analysis of variance test revealed a significant difference in self-care for different occupations. Housewives had less self-care than other groups. On the contrary, employed people were found to be more careful with their self-care (Table 1).

The correlations between self-care, resilience, age, and spiritual well-being are shown in Table 2. The self-care was positively correlated with the resilience in HD patients (r= 0.8, P = 0.001), indicating that self-care increased with the increase of resilience.

In this study, both self-care (r= -0.5, P= 0.001) and resilience (r= -0.48, P= 0.001) were negatively correlated with age, indicating that self-care and resilience decreased with an increase in age among HD patients. No significant correlation was observed between self-care and spiritual well-being (r= 0.08, P= 0.24), resilience, and age (Table 2).

In multivariate analyses, the variables of gender, marital status, educational level, transplantation history, diabetes

Table 1. Univariate analyses between of independent variables and the dependent variable (Self-Care) in HD patients

Socio-demographic variables	N (%)	*P* value	Clinical information variables		N (%)	P value
Gender[€]		0.01*	**HD Frequency per week**[€]			0.65
Female	114 (56.7)			2 times	4(1.9)	
Male	87 (43.3)			3 times	197(98.1)	
Marital status[€]		0.05	**Transplantation history** [€]			0.05
Married	153 (76.1)			No/Yes	173(86.1)/28(13.9)	
Single	48 (23.9)					
Occupation[£]		0.003*	**Chronic diseases**			
Retired	19 (9.4)		Hypertension[€]	No/Yes	66(32.8)/135 (67.2)	0.38
Employed	54 (26.9)		Hyperlipidemia[€]	No/Yes	117(58.2)/84 (41.8)	0.001*
Unemployed	22 (11)		Diabetes[€]	No/Yes	179(89)/22)11)	0.001*
Housewife	106 (52.7)					
Education[€]		0.001*	**Resource of access to knowledge**[£]			0.73
Illiterate	119 (59.2)			Physician	20(10)	
Literate	82 (40.8)			Nurse	88(44)	
				Team	92(46)	
Economic status[€]		0.25	**Duration with HD (year)**[£]			0.32
High (≥1000,000)	22 (10.9)			≤1	17(8.5)	
				2-4	132(65.6)	
Low (<1000,000)	179 (89)			≥5	52(25.9)	

[€]Independent t-test; [£]One way ANOVA; *Statistically significant.

and hyperlipidemia, age and resilience were entered into the model to buffer the effects of self-care in HD patients. Table 3 shows the Durbin-Watson statistics was less than 2.5, which indicates the independence of the residuals and there is no problem in conducting the regression. The final model showed that variables of resilience, age and diabetes explained 78% of the variance in self-care in HD patients ($P=$ 0.001) (Table 3).

Multivariate Linear Regression found the variable of resilience positively affecting the self-care of HD patients (β= 0.78, $P=$ 0.001). Age (β= -0.11, $P=$ 0.005) and diabetes (β= -0.09, $P=$ 0.01) were found to negatively affect the self-care of HD patients (Table 4). In spite of the significant relationship of gender, marital status, occupations, educational level, transplantation history and hyperlipidemia variables with self-care in univariate analysis, but with the entrance of other variables (P≤ 0.2) in the final model, the relationships was insignificant and were deleted from the model. This indicates that these variables did not exert any buffering effect on self-care.

Discussion

The findings showed that self-care was correlated positively with resilience and negatively with age and having diabetes; multivariate regression analysis demonstrated that resilience exerted a buffering effect on self-care in HD patients. Resilience can be an important factor in physical and mental health promotion.[34,35] Ma et al., found a positive correlation between resilience and health promoting behavior in HD patients.[36] Similarly, the results of a systematic review indicated that self-care behavior and resilience could affect the disease progression in chronic patients.[37] Resilience leads to purpose in life, better self-esteem, and effective interpersonal relationships.[38,39] The resilient individuals are able to handle the difficulties positively.[40] Therefore, the resilience should be considered as one of the important factors affecting self-care.[41]

The present study showed a negative correlation between age and self-care in HD patients. These findings are in line with previous studies and indicate that self-care of HD patients decrease over the time.[6,2,42] However Unsar et al., found no significant relationship between age and self-care in HD patients.[13] It seems that with the age increasing, physical problems and care requisites will increase in HD patients as they have lower energy for self-care than the younger patients.

Another result of this study revealed that spiritual well-being was not a predictor for self-care in HD patients. Others studies showed a positive relation between spiritual well - being and problem-oriented coping strategies and treatment adherence in HD patients.[43] However, some previous studies reported negative correlation or no correlation between spirituality and treatment adherence.[44,45] Furthermore Freire et al., showed that spirituality was associated with dialysis adherence, but not with medication adherence among patients.[45] It seems that some people with chronic diseases have more adherence to religious coping approaches and they consider their illness as God's will. Thereby, they rely on praying and religious deeds more than self-care activities to improve their chronic condition. Naeem found that Kashmiri Muslim men failed to self-manage their diabetes. Their dominant attitude was enjoying the life and leaving the rest to God.[46]

The findings showed that patients with diabetes undergoing dialysis had less self-care. Diabetes alone

Table 4. Multivariate linear regression analyses of self-care using stepwise method

Model	B	Std. Error	β	T	*P* value
Constant	21.41	1.76		12.1	0.001
Resilience	0.35	0.017	0.78	20.15	0.001*
Age	-0.05	0.016	-0.11	-3.03	0.005*
Diabetes	-1.7	0.64	-0.09	-2.66	0.01*

*Statistically significant.

Table 2. Bivariate correlations between self-care and quantitative variables in HD patients

Correlation of variable	Mean (SD)	Self-care	Resilience	Spiritual well-being	Age
Self-care	35.5 (5.69)	1			
Resilience	53.4 (12.94)	r= 0.8*	1		
Spiritual well-being	97.4 (17. 9)	r= 0.08	r= 0.04	1	
Age	51. 3 (12.8)	r= -0.5*	r= -0.48*	r=0.01	1

*P was significant at level < 0.01.

Table 3. Regression model to predict self-care in HD patients

Model	Source of change	Sum of squares	df	R	R2	F	*P* value	Durbin-Watson
	Regression	5099.71	3					
Stepwise	Residual	1385. 38	197	0.88	0.78	246. 52	0.001*	1. 53
	Total	6458.1	200					

*Statistically significant.

increases the risk of developing CKD by up to 12 times in men and eight times in women.[47] In a study by Sorensen et al., diabetic dialysis patients self-rated physical health was significantly reduced compared with that of the two non-diabetic dialysis patients and diabetic patients with normal kidney function.[48] Gregory & Jenkins reported the self-care of patients with diabetes undergoing dialysis as complex and needing psychological support.[47] These findings indicate that dialysis is as effective in diabetic as in non-diabetic patients.[49] Patients with diabetes undergoing dialysis have a reduction in physical health and limitations in daily activities such as climbing stairs, walking, bathing and dressing and reduced role functioning at work or at home as a result of physical health problems. A qualitative study showed that health status, self-motivation, and independence were the most important factors facilitator self-care in HD patients.[50] Accordingly, The education provided by healthcare providers related to self-care is significant and have positive effects on the overall health and well-being of patients with chronic disease such as patients with diabetes undergoing dialysis.[51] Although participating in the study was voluntary, the participants may have given unrealistic or imprecise answers to the spiritual well-being scale items, which compromise the accuracy of the results.

Conclusion

The findings of this study showed that the resilience, age, and being diabetic were important predictive factors for self-care in HD patients. The self-care increased with the increase of resilience. Both self-care and resilience decreased with an increase in the age of HD patients. It was also found that being diabetic was a predictor of decreased self-care in HD patients. Healthcare providers need to aware that diabetic dialysis patients and older patients have lower self-care and resilience than non-diabetic dialysis patients or younger patients. Therefore, they should pay more attention to HD patients who are diabetic and older, as they are at a higher risk of having impaired self-care.

Research Highlights

What is the current knowledge?

- The prevalence of CKD is increasing in the world. The growth rate in Iran is higher than the average global rate.
- Self-care enhances patients' capability to cope with the consequences of chronic conditions.
- The spiritual well-being is predictive factors of the patients' resilience .
- It is essential to identify the predictive factors of self-care in patients with CDK.

What is new here?

- In HD patients, self-care decreases with age.
- Resilience can help improve self - care.
- The spiritual well-being was not a predictor for self-care in this study and there is a need for experimental studies in this area.

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Ethical Issues

None to be declared.

Conflicts of Interest

The authors declare no conflicts of interest.

Authors' Contributions

SIA, NMA, SS: Conceptualization; FSIA, NMA, HA: Methodology; HA: Formal analysis; HA, SS: Data curation; SS, FSIA: Writing-original draft preparation; FSIA, NMA: Writing-review and editing; FSIA: Supervision; FSIA, NMA: Project administration. All authors have read and agreed to the published version of the manuscript.

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