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On the Hemodialysis Patients' Family Function in Zanjan Province in 2019

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Abstract

Background: Renal failure is a chronic disease getting more prevalent nowadays.
Objectives: Since caring for the patients is expected to result in family functioning disorders, this study was done in Zanjan Province in 2019 to determine the extent of the hemodialysis patients' family function.
Methods: This is a descriptive study. 199 patients undergoing hemodialysis treatment were selected through the stratified random sampling method. Data collection tools included demographic information questionnaire and McMaster Family Functioning Questionnaire. The data were analyzed by Kolmogorov-Smirnov test, descriptive statistics, independent t-test and Pearson correlation coefficient in the SPSS software version 25.
***Results*:** About half of the participants were male (52.3%), married (76.4%), the family caretaker (56.3%) and urban dwellers (70.4%), having insufficient income per month (75.4%). 52.7% of the patients under study were more than 60 years old. The age group 20-29 (six percent) had the lowest frequency in the population of the hemodialysis patients under study. Furthermore, 15.1% of the participants had no health insurance coverage and there was no social support system backing 67.3% of the participants. All dimensions of family functioning, under this study, fell within the normal range. The mean scores of family functioning dimensions were lower in terms of problem solving dimension than in other dimensions (The problem solving dimension score equaled 1.88 within the range of 0–4) and families functioned better in this respect. Furthermore, the results proved significant statistical relationship between number of family members, sufficient family income, and the distance from the hemodialysis centers and being covered by the social support system on the one hand and some dimensions of family functioning on the other hand ($p<0.05$).
Conclusion: Regarding the study results, the healthcare system is suggested to provide social support for the patients and their families; furthermore, education of families is recommended in order to promote favorable performance.

Keywords: family function, chronic kidney failure, hemodialysis patients

Introduction

Chronic kidney failure is one of the most prominent diseases threatening public health, resulting from the progressive and irreversible kidney failure. This will lead to the inability of the body to keep a balance between water and electrolytes and remove wastes [1].

According to Iran 2016 Annual Data Report on Dialysis, the number of renal failure patients worldwide at the end of 2016 was estimated at 3,730,000, of which 2,648,000 were treated with hemodialysis and the rest were treated with peritoneal dialysis. Due to the annual growth rate of approximately 5-6% of patients worldwide,

compared to population growth (1.1%), this disease is one of the most important medical problems in all countries of the world. The global mean of chronic renal failure was 510 per million, while its prevalence in Iran was 680 per million and above the global average [2]. Hemodialysis and its numerous sessions affect all aspects of one's life; restricting daily activities, recreational and social activities, dependence on others, restricted nutrition, job loss and financial stress as well as family problems [3,4]. An occurrence of a serious illness in the family has a profound effect on the family system, especially the role structure and functions of the family [5]. In the meantime, the better the family performs and the better the cohesion, the lesser the detrimental effects of the disease on the each of the family members and the greater the power of the system to support the patient will be. Family functioning consists of approaches that the family uses for self-maintenance and integration. Dimensions of the family functions are as follows: Problem solving, communication, roles, affective responsiveness, and affective involvement as well as behavioral control [6].

Since family's normal functioning is affected by stress and illness, it can therefore be an important component of preventing illnesses and protecting the health of each of its members [7]. Based on proof and evidence, the family involvement, invigorated by intimacy and cooperation among the members, will ward them off all the incoming life pressures [8].

Holder showed that the survival rate of hemodialysis patients was directly correlated with the quality of family support and reduced family support, which serves as a major risk factor for mortality of the group of patients [9], indicating the importance of family functioning for the patients.

Ample studies, like studies of Sánchez et al. [10], Yaqubi [11] and Birami et al. [12] have indicated malfunctioning of the family of patients suffering chronic diseases. However, the results of some studies, including the study of Pour Abdollah et al., showed that families of the cancer patients functioned normally [13].

Therefore, regarding the importance of hemodialysis patients' family function and different results pertinent to the chronic family function, and not find a study on the performance of families of hemodialysis patients in Zanjan province, this study was designed and carried out to shed light on the family function of the hemodialysis patients in Iran's Zanjan Province.

Methods

This study was a descriptive in nature, using a stratified random sampling method for the purpose of selection of the participants. The population in this study included all the hemodialysis patients referring to the kidney dialysis centers in seven cities of the Iranian Zanjan Province. The sample size was determined by Modanloo [14] study.

The study units were characterized by the following features: Getting subject to hemodialysis for at least a period of three months; being at minimum 18 years of age; having no renal transplant candidates; alertness and familiarity with time and space; and capability to answer questions. The respondents filled up the Questionnaires after receiving elaborate explanations on the aim of the study and after endorsing the informed consent either verbally or in a written form. For the illiterates or less literate (having a primary level of education), the researcher filled up the questionnaires. The data were collected in the morning and evening shifts. Each questionnaire took the respondents about 15 minutes to be filled up and the process did not coincide with the time physicians visited the patients or with the medication procedures.

This research received the IR.ZUMS.REC.1398.035 Code of Conduct for its approval. The data collection tools included a demographic information questionnaire and Psychometric the McMaster Family Assessment Device (FAD). Demographic information questionnaire included: age; gender; residence; housing condition; educational status, condition of occupation; marital status; the period of matrimonial life; number of children; age of the eldest child; number of the family members; caretaker of the household; insurance coverage; type of the health insurance; benefiting from social support system; monthly income; the time period for diagnosis of the illness; background of renal problem; and proximity to the hemodialysis center.

The McMaster Family Assessment Device (FAD) is a 60-item questionnaire, developed by Epstein,

Levin, and Bishop (1938) based on the McMaster Model. The questionnaire determines the structure, occupation, and interactive characteristics of the family and identifies six dimensions of family functioning. It also specifies the ability of the family to reconcile with family responsibilities on a four-point Likert scale of "Strongly agree" (1), "Agree" (2), "Disagree" (3), and "Strongly disagree" (4). Each scale is accorded 1 to 4 scores and can be used to distinguish between the healthy and unhealthy families from the standpoint of seven different dimensions [15]. The dimensions of family functioning based on the McMaster Family Assessment Device (FAD) are as follows: General functioning (13 questions), problem solving (6 questions), communication (7 questions), roles (9 questions), affective involvements, (8 questions), affective responsiveness (8 questions) and behavioral control (9 questions) [16]. Since the number of questions in each dimension varies with other dimensions, the scores are calculated in two ways (zero to hundred scales) and (zero to four scales) to compare and contrast different dimensions' scores with each other. In this questionnaire, lower scores signify better performance. Yousefi estimated the cut off point for the tool to be 3.43 out of 4: If one's performance stands well above 3.43, it will be interpreted as a disorder in the performance and if the subject's performance value fails to meet the point, it will be considered as healthy [17].

After its development by Epstein et al. (1983), the questionnaire's validity and reliability were assessed after its distribution among a sample of 503: The alpha coefficients fell within the range of 72% to 92%, indicating high internal consistency [18]. The questionnaire was then standardized in Iran by Zadeh Mohammadi et al. (2006) after its distribution among a group of 494 subjects. Reliability of the whole test, estimated by Cronbach's alpha, stood at 82% and the alpha of the subscales ranged between 66% and 73% and its test-retest reliability was estimated to be between 57% and 80% [19]. This study used Cronbach's alpha coefficient to estimate the tool's reliability standing at 89%. The data was put in the SPSS software version 25. The Kolmogorov-Smirnov test was used to see whether the data distribution is normal. The researcher used descriptive as well as inferential statistics; independent t-test for comparing means of two groups and Pearson correlation coefficient for deciding the degree of correlation. In this study, the P value level of significance was also set at less than 0.05.

Results

Nearly half of the patients taking part in this study were male (52.3%) and illiterate (50.8%). Furthermore, majority of the patients were urban dwellers (70.4%) and had a private home (83.4%) with insufficient monthly income (75.4%) (Table 1).

Table 1: Distribution of Some Demographic Features of the Study Samples in 2019

Frequency / Demographic Information		Number	Percentage
Sex	Female	95	47.7
	Male	104	52.3
	Total	199	100
Marital Status	Married	152	76.3
	Single	20	10.1
	Divorced and Widow(er)	27	13.6
	Total	199	100
Family Caretaker	Yes	112	56.3
	No	87	43.7
	Total	199	100
Residence	City	140	70.4
	Village	59	29.6
	Total	199	100
Housing	Private	166	83.4
	Rent	33	16.6
	Total	199	100

Level of education	Illiterate	101	50.8
	Sub-Diploma and Diploma	84	42.4
	Academic Degree	14	7
	Total	199	100
Job Status	Housewife	89	44.7
	Unemployed	27	13.6
	State Employee or Student	5	2.5
	Retired or Unable to Work	41	20.6
	Freelancer	37	18.6
	Total	199	100
Monthly Income	Sufficient	49	24.6
	Insufficient	150	75.4
	Total	199	100

Additionally, the majority of the samples fell within the age group of 60-69 years and the youngest participants fell within the age group of 20-29 years. 88.4% of the patients had no history of the disease and joined the hemodialysis cycle one to five years maximum. 15.1% of them enjoyed no health insurance coverage and for 67.3% of them there was no system to support them. Tables 2 and 3 illustrate other demographic features.

Table 2: Distribution of Certain Demographic Features of the Study Samples in 2019

Frequency	Demographic-Social Factors	Number	Percentage
Age	20-29	12	6
	30-39	20	10.1
	40-49	23	11.6
	50-59	39	19.6
	60-69	54	27.1
	70 Years Old and Higher	51	25.6
	Total	199	100
	SD±Mean	15.654±57.81	
Duration of Marital Status	1-10	33	16.5
	11-20	11	5.5
	21-30	32	16.1
	31-40	47	23.6
	41-50	41	20.6
	51-60	32	16.1
	60 Years and Higher	3	1.5
	Total	199	100
	SD ± Mean	17.71±33.82	
Number of Children	Childless	27	13.6
	۱-۳	60	30.2
	۴-۶	76	38.3
	More than 6 Years	36	18
	Total	199	100
	SD ± Mean	2.63±4.01	
Number of Family Members	1	4	2
	2-4	95	47.8
	5-7	67	33.7
	8 and More	33	16.5
	Total	199	100
	SD ± Mean	2.35±5.00	

Table 3: Distribution of the Absolute and Relative Frequencies of the Study Samples in Terms of Certain Factors Associated with the Kidney Disease in 2019

Frequency / Factors Associated with the Disease		Number	Percentage
Family Background	Yes	23	11.6
	No	176	88.4
	Total	199	100
Diagnosis Period	1-5 Years	156	78.4
	6-10 Years	30	15.1
	More than 10 Years	13	6.5
	Total	199	100
Proximity to Dialysis Center	Yes	114	57.3
	No	85	42.7
	Total	199	100
Covered by Social Support System	Yes	65	32.7
	No	134	67.3
	Total	199	100
Health Insurance	Yes	169	84.9
	No	30	15.1
	Total	199	100
Type of Insurance	Social Security	75	37.7
	Medication Services	40	20.1
	Rural Insurance	41	20.6
	Other	24	12.1
	No Insurance	19	9.5
	Total	199	100

Descriptive statistics were used to measure the mean, standard deviation, central tendency and dispersion indices.

The results showed that the mean of all dimensions of family functioning fell within the normal range and the mean scores of family function dimensions were lower (equaling 1.88 within the range of 0-4) in the problem solving dimension compared to other dimensions. The problem solving dimension of the family function was found to be performing better indeed (See Table 4). Furthermore, compared to other dimensions of family function, affective responsiveness dimension and the general function dimension had a significant statistical relationship with number of family members. This means with the increase in the number of the patient's family members, the higher the score of affective responsiveness and general function will be and the weaker family functions in those dimensions will become in fact (Table 5). Furthermore, in case of having sufficient income, the family would have gained a lower score and a better role and general functioning (Table 6).

Table 4: Mean and Standard Deviation of Family Function Dimensions of Study Samples in 2019

Dimensions	Mean	Standard Deviation	Average in 0-4 Range	Average in 0-100 Range	Confidence Interval of 0.95	
					High	Low
Problem Solving	11.32	2.924	1.88	47.00	11.735	10.917
Communications	14.37	3.177	2.05	51.25	14.816	13.927
Roles	21.21	3.469	2.36	59	21.756	20.786
Affective Responsiveness	18.40	3.181	2.30	57	18.851	17.962
Affective Involvement	17.63	4.021	2.13	53.25	18.165	17.962
Behavioral Control	19.69	3.389	2.18	54.5	20.167	19.219
General Function	27.09	5.745	2.08	52.00	27.898	26.292

Table 5: Relationship between Family Function Dimensions of the Study Samples with the Number of Family Members in 2019

No of Family Members Dimensions of Family Function	Pierson Correlation Coefficient	Pierson Test P Value
Problem Solving	0.134	0.060
Communications	0.117	0.100
Roles	0.038	0.596
Affective Responsiveness	0.186	0.008
Affective Involvement	0.093	0.192
Behavioral Control	0.109	0.125
General Function	0.141	0.047

Table 6: Comparison of the Mean Scores of the Family Function Dimensions of the Study Samples in Proportion to Income in 2019

Dimensions of Family Function	Income		Independent T-Test P Value
	Insufficient	Sufficient	
	SD±Mean	SD±Mean	
Problem Solving	10.816±2.587	11.510±3.019	0.122
Communications	13.959±2.37135	14.523±3.400	0.201
Roles	20.142±3.24037	21.664±3.4711	0.006
Affective Responsiveness	18.265±3.2453	18.449±3.1802	0.073
Affective Involvement	17.387±4.09174	17.677±4.0223	0.667
Behavioral Control	19.734±3.30262	19.684±3.4388	0.928
General Function	25.632±4.48002	27.604±6.0469	0.016

Compared to means of other dimensions of family function, the dimensions of communication and of proximity to dialysis center had statistically significant relationship and the patients' families who were distancing away from the dialysis centers had better performance in terms of the communication dimension (Table 7).

Table 7: Relationship between Family Function Dimensions of the Study Samples with Proximity to Hemodialysis Centers in 2019

Dimensions of Family Function	Proximity to the Dialysis Center		Independent T-Test
	Yes	No	
	SD ± Mean	SD ± Mean	P Value
Problem Solving	۱۱.۴۴±3.14	16.11±2.61	0.501
Communications	14.76±3.18	13.84±3.10	0.044
Roles	21.38±3.66	21.11±3.20	0.591
Affective Responsiveness	18.21±3.39	18.67±2.86	0.314
Affective Involvement	17.51±4.45	17.71±3.38	0.729
Behavioral Control	19.50±3.75	19.95±2.81	0.352
General Function	27.39±6.14	26.69±5.16	0.396

Additionally, the results indicated that families that were covered by the social support system had a weaker performance in all the subscales, excluding in terms of the behavioral control dimension (Table 8).

Table 8: Comparison of the Mean Scores of Family Function Dimensions of the Study Samples in Terms of covered by the social support system in 2019

Dimensions of Family Function	covered by the social support system		Independent T-Test
	Exists	Does Not Exist	
	SD±Mean	SD±Mean	P Value
Problem Solving	12.092±3.422	10.984±2.601	0.023
Communications	15.430±3.601	13.893±2.842	0.003
Roles	22.369±4.002	20.763±3.085	0.005
Affective Responsiveness	19.630±3.228	17.832±3.025	0.000
Affective Involvement	19.369±3.638	16.763±3.966	0.000
Behavioral Control	20.338±3.886	19.389±3.122	0.089
General Function	29.323±6.964	25.900±4.456	0.000

Discussion

This study focused on the function of the families of the hemodialysis patients in the Iranian Province of Zanjan. The findings revealed that all aspects of family functioning well fell within the expected normal range. The findings clearly indicate that members of the families of the hemodialysis patients in Zanjan Province have adequate mutual interest and emotional asset, yielding their support for each other. Additionally, the findings showed that families had better performance in terms of problem solving dimension compared to other family functioning dimensions. The families appeared to have taken right strategies in addressing the public and everyday problems and issues. Hence, that dimension of family function could be claimed being reinforced among the members. In the same vein, Goodarzi et al. studied family functioning and depression of the family caregivers of the elderly suffering from dementia, yielding similar results [20].

The findings indicated that the communication dimension fell within normal range of the mean scores of family functioning dimensions. This is in line with the findings of a study by Pour Abdollah et al. [13]. Edwards and Clark believe that problem solving and communication are the most important family functioning dimensions [21]. However, other study, conducted in another country in connection with the group of families, one of whose members are suffering from such chronic diseases as chronic gastrointestinal problems and epilepsy, has reported inadequate and poor communication running among members of the families [22].

Moreover, the results showed that in terms of the role dimension, the mean scores of family functioning dimensions fell within the normal range. Gazendam et al. conducted a study in the

Netherlands to examine the relationship between family functioning and the emotional and behavioral problems of adolescents with their parents suffering from cancer. The study's results were similar to this study's findings [23]. Given et al, however, argued that based on the available evidences, the family functioning is susceptible to changes in the advanced stages of a family member's disease [24]. Absence of changes in certain family functions, as pointed to in certain studies, might be due to the solid relationship among the family members might be due to the special and critical situations they families, especially Iranian families, lie.

In the present study, the mean scores of family functioning dimensions were within the normal range in terms of the affective responsiveness dimension. To this end, the results of some studies indicate that affective responsiveness has improved in families one of whose members suffers from chronic disease. Pour Abadullah showed that family functioning was not impaired in terms of affective responsiveness; rather, it was improved [13]. Contrary to the findings of this study, Modanloo et al. reported that family functioning of the parents whose children suffered from cancer was disrupted in terms of affective responsiveness [14].

Based on the findings, the mean scores of family functioning dimensions fell within a normal range in terms of the affective involvement dimension. A study by Gazendam indicated an improvement in the affective involvement dimension of family functioning after a member of the family was afflicted with cancer [23]. However, Modanloo's study revealed that the unhealthiest function of the family was observed in the dimension of affective involvement, being contradictory with the findings of this study. Absence of emotional contribution and zero empathy among members of the families of the patients, suffering from chronic diseases, would provoke family problems and put the family in a faulty circle because the emotional functioning of the family serves as the main basis for the establishment and survival of families and is the most vital family practices [14]. The contradictory results may be because of the fact that families in different communities use different ways of communication. Family psychologists believe that logical relationship among members of the family will encourage stronger emotional and affective intimacy among them. They believe that if families become successful to build effective relationships with each other, there will be high levels of sincerity and intimacy among them as affective involvement between them will get stronger [25].

The results of the present study also showed that the mean scores of the dimensions of family function were within the normal range in terms of the behavioral control dimension. The finding conforms to the results of a study done by Pour Abdollah et al. [13]. Results of Some other studies have shown similar findings [26,27]. On the contrary, as the study by Goodarzi et al. at the family functioning and depression level of the family caregivers of the elderly patients who suffered from dementia showed that family functioning was subject to the highest level of discrepancy and problem in terms of the behavioral control dimension [20]. Caring for the patients seems to have been the key factor in family functioning discrepancy, especially discrepancy in the behavioral control dimension of the family function, as the illness so demands in nature and as the patients are highly dependent.

According to the results of this study, the mean scores of family functioning dimensions were within the normal range in terms of the overall performance dimension. Outcome of a study by Pour Abdollah et al. [13] fall in the same vein, while Goodarzi et al. showed contrary findings [20]. The difference in the findings might be due to the nature of the chronic disease under investigation. Basically, the effect that diagnosis of a chronic and threatening disease has on the family function's dependents to a large extent on the social relationship and culture dominating a society [24,28]. The more successful a family emerges in building stronger family relationship and acting as a whole body in the face of a hardly curable disease, the more capable will it become in tolerating emotional changes observed as a result [29].

The households provided with enough income are proved to function better in terms of their role and general functioning. Researcher believes that kidney failure is an instance of special diseases and the patients are not required to pay for hemodialysis; however, a number of the following factors cause imbalance in life costs and discrepancy in favorable family functions as a

result of lowering family income: Inability of a group of patients to work; ample expenditures caused in the medication process; the transportation charges; process, the cost of the treatment And it leads to an imbalance in living expenses, and with a decline in family income, it disrupts the family's optimal performance.

This study also indicated that clients' being away from the hemodialysis centers has encouraged better family functions in terms of communication. Regarding the specific case of the group of patients, their farthest geographical distance from the hemodialysis centers seems to have made members of their family concerned. Under such conditions, the family prefers not to leave their patient(s) alone and for sure join them in the process of medication. Speaking the other way, far distance from the hemodialysis centers seems to have encouraged members of the family to feel more responsibility. McMaster's model refers to communication as a general term in order to describe healthy family behaviors. Communication and problem-solving are the most important components of family function, easing assignment and survival of roles [30].

The results of the present study showed that the more is the number of family members of the patients, the weaker family function will be in terms of the family function's affective dimension. The more are members of the family, the less sensitive they seem to become towards each. Furthermore, families might be in different life cycles such as evolutionary crises or a different condition. These also generally influences family function. The study by Pour Abdollah et al was in the same vein [13].

Furthermore, the findings of this study showed that families of the patients, who were covered by the social support system, did not function well in terms of problem solving, communication, roles, affective responsiveness, affective involvement, and general functioning. Asadi et al. studied the case of patients subject to hemodialysis treatment to seen whether there is any relationship between social support and depression. They showed on the contrary, that there was a significant reverse relationship between level of depression and social support [31]. It's worth noting that the concept of social support in this means being covered by the social supportive organizations. Moreover, those people who are in a financially weak position are provided with social support. Furthermore, since social support given to the group of patients does not often eliminate their financial problems, and in certain cases the social support only covers the member of the family afflicted with the disease and not whole members of the family, findings of this study cannot be far from expectation.

The findings of this study revealed that families of the hemodialysis patients had natural function; however, certain personal-social variables had something to do with certain dimensions of the family functions. Regarding the fact that this study pointed to the insufficient extent of social support for the patients and falling family function with respect to the patients with insufficient income, it seems that any attention to the economic standing and providing effective social support for them will a considerable effect on the function of their families. Furthermore, family briefing seems to upgrade family faction to a favorable level. Private centers' refusal to extent favorable cooperation should be accounted as an instance of the study limitations. Absence of cooperation on their part faced sampling in these centers so difficult. Furthermore, certain patients' disinterest to fill up questionnaires and their conservative in answering questions were among other limitations of the study: The hesitant patients were however, provided with enough explanations – that they will be kept anonymous and that their information will be confidential- and they were encouraged to fill the instrument at an appropriate time and within the required time span regarding their fatigue and mood. A questionnaire was the instrument for the collection of data in this study, so it was expected to come across with limitations in terms of personal information delivery.

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Conflict of interest

The authors of this article confirm that there is no conflict of interest with regards to present study.

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