

Original Article

Depression and anxiety among patients with chronic kidney disease receiving hemodialysis

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Abstract

Introduction: Depression and anxiety are among the most common comorbid illnesses in people with end-stage renal disease. The current study aimed to assess the actual pattern of symptoms of depression and anxiety in the hemodialysis population in Qazvin.

Methods: For this purpose, 80 individuals (40 hemodialysis patients and 40 individuals as the control group) have participated in this study. All participants completed Beck Depression Inventory and Cattell Anxiety Inventory. Additionally, clinical status, socio-economic and demographic variables of patients have been collected and analyzed by appropriate statistical methods (independent T-test and chi-square test).

Results: In examining the variables of depression in terms of severe and mild depression, there have been 14 hemodialysis patients (35%) versus 34 (85%) individuals from the control group, in terms of moderate depression-severe index there has been 26 (65%) versus 6 (15%). Regarding the anxiety variable in terms of the maximum mild anxiety there has been 23 (57.5%) hemodialysis patients versus 33 (82.5%) individuals from the control group, in terms of moderate-severe anxiety there has been 17 (42.5%) versus 7 (17.5%). Among symptoms, depression had a significant correlation with diabetes, high blood pressure, and duration of dialysis ($p < 0.05$). Regarding anxiety, this significant correlation was only seen with the duration of dialysis.

Conclusion: The current study showed that the prevalence of depression and anxiety in hemodialysis patients are significant and correlates with clinical variables, so for improving this clinical concern, effective interventions for mental health should be taken into consideration and the impact of these interventions should be investigated.

Declaration of Interest: None.

Keywords: Kidney Diseases, Dialysis, Depression, Anxiety.

Introduction

End-stage renal disease (ESRD) is a severe form of chronic kidney disease that requires dialysis for more than three months (1, 2). Based on existing studies, the prevalence of this disease is increasing not only in Iran, but also worldwide. stressors associated with ESRD include sexual dysfunctions, cognitive impairments,

neurological disturbances, cognitive impairments, physiological changes, and biochemical imbalances (3). The majority of ESRD patients in Iran are undergoing hemodialysis (4). Dialysis care is a lifesaving treatment for patients with end stage of renal disease (5).

Dialysis care leads to changes in occupation, marriage, family and social

lives of affected individuals. These changes provide the basis for increased anxiety and depression. The effects of disease, diet restrictions, time limits, financial burden, a sense of failure and stresses caused by the impending death awareness are factors that will impede the normal life (6-9), so determining the psychological effects of hemodialysis is very important. In the general population the prevalence and incidence of anxiety is in the range of 18 percent and 25-29 percent (10, 11). This rate for depression is 2-9 percent and 12-20 percent. The prevalence of anxiety and depression which is about 30-45 percent and 20-30, respectively is higher for patients undergoing dialysis than the general population (11, 12). This rate varies in different areas; in addition to the used instruments, it also depends on other variables such as age, race, and other socio-demographic status (13). It is therefore essential to determine the levels of anxiety and depression in different areas so by this action constant monitoring of the health of dialysis patients would take place.

On the other hand, mental health can affect the recovery process of ESRD patients through poor adherence to treatment (14, 15); as studies have shown that mortality and length of hospitalization of these patients undergoing dialysis is twice as the patients without mental disorders (16). Lopez and colleagues have shown that the rate of withdrawal from therapy in hemodialysis patients who suffer from depression is higher than other patients undergoing hemodialysis (17); therefore, the diagnosis of anxiety and depression during the early stages of chronic kidney disease (CKD) is very important because one of the significant predictors of the development of chronic kidney disease side effect is the start of hemodialysis treatment, duration of hospitalization and death (15). The current study aimed to assess the actual pattern of symptoms of depression and anxiety in the hemodialysis population in Qazvin. For this purpose the relationship between these variables and clinical

conditions, socio-economic and demographic characteristics have been examined.

Methods

This case-control study has been conducted in the hemodialysis clinic of Bu-Ali Sina Hospital in Qazvin, Iran, from July 2015 to August 2016. All patients who have been hospitalized during the study period in nephrology (40 ESRD patients) have been enrolled in the study. This study was conducted in accordance with the priorities of University of Medical Sciences of Qazvin and it did not have any moral problem and it has been approved by the university ethics committee (IR.QUMS.REC.1394.435). Inclusion criteria included signing the informed consent form and the lack of psychological disorders under medical or psychoanalysis treatments. Patients who suffered from chronic renal failure but not undergoing hemodialysis have been excluded from the study. In addition, patients who were not compliant with renal replacement therapy and their hemodialysis time were less than three months have been excluded from the study. In order to compare these disorders in dialysis patients with the general population, the above assessment also have been conducted on 40 healthy subjects. The control group had been selected from the immediate family members for better matching purposes. In addition, the control group had been selected so that patients comply with in terms of the age average and sex.

Participants were interviewed when they came for their dialysis sessions. Socio demographic and economic data (age, sex, body mass index and socioeconomic status), details of laboratory examinations, clinical conditions and other dialysis details have been collected and recorded in special forms. Symptoms of depression have been evaluated using Beck Depression Inventory and Cattell anxiety symptoms have been used for assessing anxiety.

The Kuppuswamy scale: The Kuppuswamy scale was developed by

Kuppuswamy in 1976. Socioeconomic status of patients was evaluated using KUPPUSWAMY scale of socioeconomic status. In this scale, education, occupation and monthly income have been considered (18). Similar to the Kuppuswami scale, a questionnaire was developed by the authors in Persian language. The internal consistency of the questionnaire was calculated using Cronbach's alpha (0.83). The validity of the questionnaire was calculated using the reliability index ($r_{\alpha}=.91$).

Beck's Depression Inventory: This questionnaire has a maximum score of 63; a score of 0-15 indicates a normal situation, 16-30 scores indicate mild depression, 31-46 indicates moderate depression, and 47-63 indicates severe depression (19, 20). Kaviani et al., showed that the Persian version of Beck proved a good reliability ($r=0.72$), a very good validity ($r=0.83$), and an excellent internal consistency ($\text{Alpha}=0.92$) (21).

Cattle Anxiety Inventory : Cattle Anxiety Inventory is a 40 item questionnaire. A score of 4-6 indicates moderate degree of anxiety; a score of 7-8 indicates neurotic

anxious person and finally a score of 9-10 indicates a person who clearly needs help whether to modify its position or to consult and receive psychotherapy (23, 24). Salarifar et al., showed that the Persian version of Cattle proved an acceptable reliability and validity ($r=0.81$), and an acceptable internal consistency ($\text{Alpha}=0.77$) (25).

After collecting data, the results have been analyzed using SPSS version 22. The data have been presented with the use of frequencies and percentages for categorical variables and by average and standard deviation for continuous variables. To compare continuous variables, independent T-test has been used, and for comparing categorical variables, chi-square test has been used. p -value<0.05 was considered as the significant level.

Results

A total of 40 patients in the Nephrology section of Bu-Ali Sina hospital have been studied, and 22 (55%) were males and 18 (45%) were females.

Table 1. Comparing symptoms of depression and anxiety, and other demographic and socio-economic characteristics in the two groups.

Variables	Patients	Control Group	p
age	44.12 (13.2)	43.12 (12.1)	0.724
sex/ male (female)	22 (18)	22 (18)	$p>0.05$
body mass index	22.24 (4.78)	23.11 (7.88)	0.55
Socioeconomic status			
High class	2 (5%)	5 (13%)	0.49
Middle class	11 (28%)	10 (25%)	
Low class	27 (68%)	25 (63%)	
Depression			
Maximum of mild depression	14 (35%)	34 (83%)	$p<0.001$
Moderate-severe depression	26 (65%)	6 (15%)	
Anxiety			
Maximum of mild anxiety	23 (57.5%)	33 (82.5%)	0.015
Moderate-severe anxiety	17 (42.5%)	7 (17.5%)	

In Table 1. symptoms of depression and anxiety, demographic and socio-economic characteristics have been shown for the two

groups. The average age of participants in patients group was 44.12 ± 13.2 years and it was 43.12 ± 12.1 years for the control

group. According to independent t-test, there was no significant difference in the two groups in terms of age average. Regarding the distribution of gender, socioeconomic status and body mass index there was also significant difference between the two groups. The prevalence of depression and anxiety was significantly higher in the patient group comparing to the control group.

In examining the variables of depression regarding maximum mild depression index, there has been 14 (35%) hemodialysis patients versus 34 (85%) individuals from the control group, and regarding moderate-severe index, there had been 26 (65%) patients versus 6 (15%) (p-value<0.001). In the case of anxiety variable the

maximum mild anxiety index, there has been 23 (57.5%) in hemodialysis patients versus 33 (82.5%) individuals from the control group, and in terms of moderate-severe anxiety index, there have been 17 (42.5%) patients versus 7 (17.5%) individuals (p-value=-.015) (table 1).

45 percent of patients in this study were female and 67.5% were married. The initial analysis of the Beck questionnaire showed that 70% of patients suffered from some degree of depression. About 65% of them had moderate to severe depression. Initial analysis of Cattell questionnaire showed that 52.5 percent of patients had some degree of anxiety. About 42.5 percent of them had moderate to severe anxiety.

Table 2. Relationship between depression and anxiety with demographic data and clinical characteristics

Variable	Categories	depression		p	anxiety		p
		yes	no		yes	no	
sex	male	15(53.6%)	7(58.3%)	0.781	12(57.1%)	10(52.6%)	0.775
	female	13(46.4%)	5(41.7%)		9(42.9%)	9(47.4%)	
age	<50	18(64.3%)	8(66.7%)	0.885	14(66.7%)	12(63.2%)	0.816
	>50	10(35.7%)	4(33.3%)		7(33.3%)	7(36.8%)	
marital status	single	6(21.4%)	2(16.7%)	0.788	5(23.8%)	3(15.8%)	0.727
	married	18(64.3%)	9(75)		13(61.9%)	14(73.7%)	
	widowed	4(14.3%)	1(8.3%)		3(14.3%)	2(10.5%)	
education status	under diploma	12(42.9%)	7(58.3%)	0.667	8(38.1%)	11(57.9%)	0.397
	diploma	13(46.4%)	4(33.3%)		11(52.4%)	6(31.6%)	
	university education	3(10.7%)	1(8.3%)		2(9.5%)	2(10.5%)	
diabetes	yes	26(92.9%)	8(66.7%)	0.034	18(85.7%)	12(63.2%)	0.1
	no	2(7.1%)	4(33.3%)		3(14.3%)	7(36.8%)	
hypertension	yes	17(60.7%)	2(16.7%)	0.011	10(47.6%)	4(21.1%)	0.079
	no	11(39.3%)	10(83.3%)		11(52.4%)	15(78.9%)	
duration of dialysis	<12	12(42.85%)	2(16.66%)	0.04	9(42.85%)	2(10.52%)	0.046
	13-24	6(21.42%)	5(41.66)		5(23.80%)	3(15.78)	
	25-36	6(21.42%)	0(0%)		5(23.80%)	7(36.84)	
	>36	4(14.28%)	5(41.66)		2(9.52)	7(36.84)	

Table 2. summarizes the sociodemographic and clinical characteristics of Patients with depression and anxiety. Among the studied patients symptoms of depression have been significantly higher in diabetic and hypertension individuals. In addition, there

has been a significant correlation between duration of dialysis and depression so that symptoms of depression have been observed more among hemodialysis patients who were undergoing dialysis for less than a year. Unlike mentioned

variables, there has been no significant association between age, sex, marital status, and education of the depressed patients (Table 2). The other part of Table 2. summarizes the sociodemographic and clinical characteristics of patients with anxiety. Like depression, there was a significant correlation between the duration of dialysis and symptoms of anxiety. Except for the mentioned variable, there was no significant correlation between other demographic and clinical characteristics.

Conclusion

Since diagnosis and treatment of anxiety and depression is very important during the early stages of chronic kidney disease, the current study aimed to assess the true pattern of symptoms of depression and anxiety in hemodialysis population in the city of Qazvin. The results showed that the prevalence of depression and anxiety is significantly higher comparing to control group. The prevalence of depressive symptoms in the current study was 70%, which is higher than previous studies reported in the literature review. For example, in a study by Lopes et al., 56.9% of patients had been suffering from some degree of depression (26). The difference in the prevalence can be the result of different screening assessment for measuring these different disorders; because the cut-off point within these tools can affect the detection point (13). In a study by Caren et al., Beck questionnaire have showed that 48% of ESRD patients suffer from some degrees of depression (27). Studying literature shows that in addition to mentioned case, socioeconomic and demographic variables are also effective in the degree of depression and anxiety (28). Therefore, in the current study a control group has been used so the progress of comparison would take place more realistically. The results of table 1 showed that there is no statistically significant difference between the two groups in terms

of age, sex, body mass index and economic status.

On the other hand, in this study the anxiety disorder was 52.5% among hemodialysis patients. These values for depression and anxiety have been slightly higher than most Western countries. Such results in a country like Iran is somewhat expected. In a study conducted by Nazemian and colleagues the rate for depression and anxiety were 64.5% and 51.4% respectively (4). Despite the high levels of anxiety and depression scores in hemodialysis patients of the current study, which is a serious problem, there was no statistically significant association between depression and anxiety with the examined demographic data. For example, there was no significant correlation between gender and mental health variables in this study. Nazemian and colleagues, also have found similar results in their study (4). Unlike the current study, depression in women was higher in previous studies (29, 30). These studies claimed higher incidence of depression and anxiety symptoms in women to be due to that fact that women are vulnerable to stressors (28).

In these studies, there has been an association only between depression with variables such as duration of dialysis, diabetes and hypertension. Regarding anxiety, such association have only found with the duration of dialysis. Recent and possible evidence in this field suggest that coming to clinic for hemodialysis is not only stressful but common events such as getting plugged into hemodialysis machine by a new personnel or hearing the alarm during dialysis also increases the anxiety of the patient (13). In the current study, the duration of hemodialysis of less than one year had been associated with symptoms of depression and anxiety. This was consistent with the results of a study by Vasilios and colleagues in which they have reported that the initial stage of ESRD and the first year after initiation of dialysis is associated with greater risks of depression and anxiety (31). Perhaps one of the reasons is that there is a

need for time to comply would be required to adapt with this new situation.

Studies have shown that symptoms of depression are significantly associated with comorbid conditions such as mellitus diabetes and hypertension (32). This has led to the examination of such associations in the current study. The results showed that depression is significantly higher only in patients with diabetes and hypertension; and regarding anxiety such association has not been observed. Sanathan and colleagues also have found similar results (28). Depression and anxiety in mentioned study are significant and require an appropriate approach to reduce such disorders. Cognitive behavioral therapy and interventions that target these symptoms can be effective in such situations (33, 34).

One of the limitations of the current study was the possibility of bias in collecting the information of illiterate patients. Another limitation of the study was its short period and choosing only one hospital for the study. Therefore, the study population was limited. Since the number of controlled studies in this area is limited, this was one of the strengths of this study.

This study showed that depression and anxiety are common in hemodialysis patients comparing to control group. In a more detailed study, it has been found that depression is associated with diabetes, high blood pressure, and duration of dialysis. Regarding anxiety such association was only significant with the duration of dialysis. It is therefore necessary that primary care should be established by a reaction-based system to maintain necessary and effective measured for mental health so that creates a better infrastructure for management of chronic kidney disease on hemodialysis treatment; and ultimately the effects of these interventions should also be investigated.

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