

Depression and chronic renal patients on hemodialysis: associated factors

Depressão e pacientes renais crônicos em hemodiálise: fatores associados

Depresión y pacientes renales crónicos en hemodiálisis: factores asociados

Carolina Renz Pretto¹

ORCID: 0000-0002-6925-7969

Marina Brites Calegari da Rosa¹

ORCID: 0000-0003-1880-355X

Cátia Matte Dezordi¹

ORCID: 0000-0001-5540-4393

Sabrina Azevedo Wagner Benetti¹

ORCID: 0000-0002-1953-8762

Christiane de Fátima Colet¹

ORCID: 0000-0003-2023-5088

Eniva Miladi Fernandes Stumm¹

ORCID: 0000-0001-6169-0453

¹ Universidade Regional do Noroeste do Estado do Rio Grande do Sul. Ijuí, Rio Grande do Sul, Brazil.

How to cite this article:

Pretto CR, Rosa MBC, Dezordi CM, Benetti SAW, Colet CF, Stumm EMF. Depression and chronic renal patients on hemodialysis: associated factors. Rev Bras Enferm. 2020;73(Suppl 1):e20190167. doi: <http://dx.doi.org/10.1590/0034-7167-2019-0167>

Corresponding author:

Carolina Renz Pretto
E-mail: carol.renzpretto@gmail.com



EDITOR IN CHIEF: Antonio José de Almeida Filho
ASSOCIATE EDITOR: Priscilla Broca

Submission: 03-07-2019 **Approval:** 09-15-2019

ABSTRACT

Objective: to verify the association of sociodemographic and clinical variables, life habits and functional capacity with symptoms indicative of depression in chronic renal patients on hemodialysis. **Method:** cross-sectional study developed from February to October of 2017 with 183 patients undergoing hemodialysis in two renal units located in the state of Rio Grande do Sul. Data collected with clinic and sociodemographic questionnaire and Beck Depression Inventory. Analysis with descriptive and analytical statistics and the chi-square test. **Results:** 55.2% of participants were elderly, 66.4% men, 90.7% retired, and 60.3% presented depressive symptoms. An association was found between symptoms indicative of depression and the female sex, greater number of comorbidities and post-hemodialysis interurrences, emotional and physical symptoms, inactivity, failing to perform usual activities and the need for assistance in day-to-day. **Conclusion:** depressive symptoms are associated with burden of comorbidities, greater number of disease complications, hemodialytic interurrences and functional dependence. Physical exercise practice can be an effective care strategy. **Descriptors:** Depression; Chronic Renal Insufficiency; Exercise; Activities of Daily Living; Renal Dialysis.

RESUMO

Objetivo: verificar a associação entre variáveis sociodemográficas, clínicas, hábitos de vida e capacidade funcional com indicativos de depressão de pacientes renais crônicos em hemodiálise. **Método:** pesquisa transversal, desenvolvida de fevereiro a outubro de 2017 com 183 pacientes em hemodiálise de duas unidades renais do estado do Rio Grande do Sul. Coleta de dados a partir de questionário sociodemográfico e clínico e Inventário de Depressão de Beck. Análise com estatística descritiva e analítica e uso do teste qui-quadrado. **Resultados:** 55,2% dos participantes são idosos, 66,4% homens, 90,7% aposentados, 60,3% apresentaram sintomas depressivos. Houve associação entre indicativos de depressão com sexo feminino, maior número de comorbidades e intercorrências pós-hemodiálise, sintomas físicos, emocionais, inatividade, deixar de realizar atividades habituais e a necessidade de auxílio no dia a dia. **Conclusão:** sintomas de depressão estão associados à sobrecarga das comorbidades, maior número de complicações da doença, intercorrências hemodialíticas e dependência funcional. Exercícios físicos podem ser estratégias efetivas de cuidado.

Descritores: Depressão; Insuficiência Renal Crônica; Exercício; Atividades Cotidianas; Hemodiálise.

RESUMEN

Objetivo: averiguar la asociación entre variables sociodemográficas, hábitos de vida y capacidad funcional con indicativos de depresión de pacientes renales crónicos en hemodiálisis. **Método:** investigación transversal desarrollada desde febrero a octubre de 2017, con 183 pacientes en hemodiálisis de dos unidades renales del estado de Rio Grande do Sul. Recolección de datos con cuestionario sociodemográfico y clínico e Inventario de Depresión de Beck. Análisis con estadística descriptiva y analítica y teste Chi-cuadrado. **Resultados:** 55,2% de los participantes son ancianos, 66,4% hombres, 90,7% jubilados, 60,3% presentaron síntomas depresivos. Hubo asociación entre indicativos de depresión con sexo femenino, mayor número de comorbidades y de complicaciones post diálisis, síntomas físicos, emocionales, inactividad, dejar de hacer actividades habituales y necesitar de ayuda en el día a día. **Conclusión:** síntomas de depresión se asocian a sobrecarga de las comorbidades, mayor número de complicaciones de la enfermedad, ocurrencias post diálisis y dependencia funcional. Ejercicios físicos pueden ser estrategias efectivas de cuidado.

Descriptor: Depresión; Insuficiencia Renal Crónica; Ejercicios; Actividades Cotidianas; Diálisis Renal.

INTRODUCTION

Worldwide, an estimated 322 million people have depression (27% in the Western Pacific - India and China, 21% in Southeast Asia, 16% in the Eastern Mediterranean and 15% in the Americas) associated with health loss, disability and suicide. In Brazil, approximately 5.8% of the population has the disease⁽¹⁾. Depressive disorders comprise a set of disorders characterized by sad, irritable mood, coupled with somatic and cognitive changes that affect individual functioning⁽²⁾.

Studies have shown the association between depression and chronic kidney disease (CKD)⁽³⁻⁵⁾, which is the loss of renal function and/or presence of renal damage for more than three months with progressive metabolic and endocrine changes and systemic repercussions⁽⁶⁾. Among renal replacement therapies, hemodialysis is the most used, and in Brazil, in 2016, 92.1% of the 122,825 patients with CKD were on hemodialysis treatment⁽⁷⁾. Dialysis therapy and kidney disease affect patients' physical and psychosocial conditions⁽⁸⁾, which predisposes them to depression.

Research has investigated the presence of depression in patients with kidney disease and the complications presented by subjects undergoing different modalities of dialysis treatment, particularly hemodialysis. However, these have been general studies⁽⁹⁻¹⁰⁾ and were found no publications addressing the association between depressive symptoms and complications, specifically during or after the dialysis session.

Scientific productions on physical and emotional symptoms and those indicative of depression are scarce and generally addressed in an integrated manner. Fatigue in renal patients and the relationship with depression has been the subject of studies, although still poorly addressed⁽¹¹⁾, as well as irritability⁽¹²⁾, sadness⁽¹³⁾ and suicidal ideation⁽¹⁴⁻¹⁵⁾. Anxiety and depression are jointly evaluated in patients with CKD⁽¹⁶⁻¹⁷⁾ and few studies explore the relationship between them⁽⁵⁾. Gastrointestinal symptoms are often linked to the uremic condition and there is a clear gap in the association with psychosomatic disorders⁽¹⁸⁾. On the other hand, the link between sleep disorders and depression seems to be well understood⁽¹⁹⁻²⁰⁾.

Several studies address sociodemographic factors and relate them to depression in patients on dialysis treatment, along with other conditions^(4,21-22). Similarly, they seek for an association with comorbidities^(16,23), but few consider the effect of multiple conditions. Regarding lifestyle and psychoemotional disorders, studies on the theme especially evaluate the effect of physical activity⁽²⁴⁾, but rarely explore the association with diet or water intake in CKD⁽²⁵⁾. Regarding functional status, studies have analyzed the relationship with depression and show worse outcomes for functional dependent patients⁽²⁶⁻²⁷⁾.

Given the knowledge gap, the evaluation of the association between depressive symptoms and complications during or after hemodialysis, physical symptoms (fatigue, gastrointestinal symptoms), emotional symptoms (irritability, sadness, anxiety), multiple comorbidities, diet and water intake is the target of this study and shows its innovative character.

OBJECTIVE

To assess the association of sociodemographic, clinical, lifestyle and functional capacity variables with symptoms indicative of depression in chronic renal patients undergoing hemodialysis.

METHODS

Ethical aspects

Data from this article are part of a master's dissertation, in which were respected the ethical precepts of research with human beings, according to Resolution number 466 of December 12, 2012 of the National Health Council⁽²⁸⁾. Project approved by the Research Ethics Committee.

Design, place of study and period

Cross-sectional, analytical study based on guidelines of The Strengthening of the Reporting of Observational Studies in Epidemiology (STROBE), directed at cross-sectional studies. It was conducted from February to October 2017 at renal reference units for the Northwest and Missões region in the state of Rio Grande do Sul. The first unit is part of a philanthropic health care institution and the second unit is a for-profit, privately run clinic that has greater demand from patients of the Unified Health System (Brazilian SUS).

Population or sample; inclusion and exclusion criteria

The study population was of 238 patients but were included 183 patients who met the following inclusion criteria: over 18 years of age and diagnosis of chronic kidney disease. Exclusion criteria were difficulty in understanding the instrument questions (observed during the interview), and performing occasional hemodialysis in the units of study, because the patient was passing through the city (travels or other necessity).

Study protocol

Data collection involved individual interviews during hemodialysis sessions. A sociodemographic and clinical questionnaire and the Beck Depression Inventory (BDI) were used. The questionnaire included identification variables - age, sex, marital status, educational level and income; clinical variables - hemodialysis time, comorbidities, CKD complications, complications during and after dialysis session, physical and emotional symptoms, nutritional and psychological evaluation; lifestyle habits - leisure, physical activity, water intake and salt intake; and functional capacity data - failure to perform usual activities and need for help in daily life.

The comorbidities were: Systemic Arterial Hypertension (SAH), Diabetes Mellitus (DM), heart failure, pericarditis, osteopathy, acute myocardial infarction, cerebrovascular diseases and liver disease. The complications of CKD included: cramps, headache, pruritus, weight loss or gain, infertility, hypotension, Systemic Arterial Hypertension, weakness, pain, arrhythmia, recurrent infections, anemia, constipation and edema. Complications during hemodialysis included the following: cramps, hypotension, cold, pain, bleeding, dyspnea, SAH, hypoglycemia and gastralgia. Complications after dialysis sessions included hypotension, weakness, nausea, dizziness, fistula pain or no symptoms.

The Beck Depression Inventory (BDI) was used to evaluate signs indicative of depression. It includes 21 items on sadness, pessimism, failure, guilt, punishment, lack of satisfaction, self-dislike, self-accusation, suicidal ideas, crying, irritability, social

withdrawal, indecisiveness, body image change, work difficulty, sleep disorders, fatigability, lack of appetite, weight loss, somatic preoccupation and loss of libido. Each item is scored from 0 to 3; a total sum of less than 10 indicates no depressive symptoms, 10 to 18 indicates mild depression, 19 to 29 indicates moderate depression, and 30 to 63 extreme depression⁽²⁹⁾.

Analysis of results and statistics

Data were inserted into an Excel spreadsheet and analyzed using the SPSS version 21.0. Descriptive and analytical statistics were performed. Joint frequency distributions and two study variables (cross-table representation of variables) were observed simultaneously in order to identify the relationship. Descriptive measures of mean and standard deviation were adopted, and the chi-square test was performed with a significance level of 0.05.

RESULTS

Of the 183 study participants, 55.2% (101) were elderly, male sex predominated with 66.4% (116) and retirees with 90.7% (166), as shown in Table 1.

Regarding clinical aspects, participants' mean time of hemodialysis was 3.05 years (± 2.81), the mean of comorbidities was 1.66 (± 1.01), of CKD-related complications was 4.79 (± 2.23), of complications during hemodialysis was 1.51 (± 0.98), and after session it was 1.04 (± 0.85). There was prevalence of symptoms indicative of depression in 60.3% (111) of patients; 36.4% (67) had mild symptoms, 22.3% (41) moderate symptoms and 1.6% (3) had severe symptoms.

Table 1 – Sociodemographic data of chronic renal patients on hemodialysis (N=183), Ijuí, Rio Grande do Sul, Brazil, 2017

Sociodemographic data	Number of patients (%)
Age	
≥ 60 years	101 (55.2)
Sex	
Male	116 (66.4)
Income	
Retirement	166 (90.7)
Marital status	
With partner	119 (65.0)
Schooling	
Low*	147 (80.3)

Note: *illiterate or elementary school.

Table 2 shows the association between depressive symptoms and the female gender, a higher number of comorbidities, more than one complication and symptoms after hemodialysis ($p < 0.05$).

Table 3 shows patients' physical and emotional symptoms and the relationship with symptoms indicative of depression. The strong association between them ($p < 0.05$) is evident, particularly of depressive symptoms with anxiety, sleep disorder, gastralgia and sadness ($p < 0.001$).

Table 4 shows the relationship between depressive symptoms, functional capacity and lifestyle, such as leisure, physical activity, water intake, salt intake and others.

Table 2 – Association between symptoms indicative of depression and sociodemographic variables, comorbidities, complications and hemodialysis complications, Ijuí, Rio Grande do Sul, Brazil, 2017

Variables	With indicative of depression n (%)	No indicative of depression n (%)	p value
Age			
< 60 years	32 (44.4)	49 (44.5)	0.722
> 60 years	40 (55.5)	61 (55.4)	
Sex			
Male	53 (73.6)	63 (56.8)	0.021
Female	19 (26.4)	48 (43.2)	
Income			
Retirement	63 (87.5)	103 (92.8)	0.228
Others	9 (12.5)	8 (7.2)	
Marital status			
With partner	46 (63.9)	73 (65.8)	0.795
No partner	26 (36.1)	38 (34.2)	
Schooling			
Illiterate	7 (9.7)	9 (8.1)	0.706
Literate	65 (90.3)	102 (91.9)	
Time on HD			
< than average ^a	48 (67.6)	73 (67.0)	0.930
> than average	23 (32.4)	36 (33.0)	
Comorbidities			
< than average ^b	39 (54.2)	43 (38.7)	0.040
> than average	33 (45.8)	68 (61.3)	
Complications			
< than average ^c	23 (65.7)	21 (48.8)	0.135
> than average	12 (34.3)	22 (51.2)	
Complications during HD			
< than average ^d	37 (51.4)	56 (50.5)	0.901
> than average	35 (48.6)	55 (49.5)	
Complications after HD			
< than average ^e	57 (79.2)	70 (63.1)	0.021
> than average	15 (20.8)	41 (36.9)	
No symptoms	28 (39.4)	24 (21.6)	0.009
Presence of symptoms	43 (60.6)	87 (78.4)	

Note: ^a≤ 3.05 years; ^b≤ 1.66 comorbidities; ^c≤ 4.79 complications related to chronic kidney disease; ^d≤ 1.51 complications during hemodialysis; ^e≤ 1.04 complications after the session; HD: hemodialysis.

Table 3 – Physical and emotional symptoms presented by patients and relationship with symptoms indicative of depression, Ijuí, Rio Grande do Sul, Brazil, 2017

Symptoms	With indicative of depression n (%)	No indicative of depression n (%)	p value
Anxiety			
Yes	34 (47.9)	85 (76.6)	<0.001
No	37 (52.1)	26 (23.4)	
Fatigue			
Yes	31 (43.7)	74 (66.7)	0.004
No	40 (56.3)	37 (33.3)	
Sleep disorders			
Yes	34 (47.9)	85 (76.6)	<0.001
No	37 (52.1)	26 (23.4)	
Gastralgia			
Yes	16 (22.5)	55 (50)	<0.001
No	55 (77.5)	55 (50)	

To be continued

Table 3 (concluded)

Symptoms	With indicative of depression n (%)	No indicative of depression n (%)	p value
Irritability			
Yes	21 (29.6)	52 (46.8)	0.020
No	50 (70.4)	59 (53.2)	
Sadness			
Yes	21 (29.6)	68 (61.3)	<0.001
No	50 (70.4)	43 (38.7)	
Suicidal ideation			
Yes	2 (2.8)	16 (14.4)	0.018
No	69 (97.2)	95 (85.6)	

The table shows a strong association between the lack of physical activity and the need for daily assistance and symptoms indicative of depression ($p < 0.001$). Failing to perform usual activities is also related to depressive symptoms ($p < 0.05$).

Table 4 – Relationship between physical activity, leisure, daily activities, nutritional and psychological assessment, water intake, salt intake and symptoms of depression, Ijuí, Rio Grande do Sul, Brazil, 2017

Variables	With indicative of depression n (%)	No indicative of depression n (%)	p value
Leisure			
Yes	54 (75,0)	74 (67,9)	0,305
No	18 (25,0)	35 (32,1)	
Physical activity			
Yes	47 (65,3)	36 (32,4)	<0,001
No	25 (34,7)	75 (67,6)	
Failing to perform usual activities			
Yes	49 (68,1)	90 (81,1)	0,044
No	23 (31,9)	21 (18,9)	
Assistance in day to day			
Yes	15 (20,8)	62 (56,4)	<0,001
No	57 (79,2)	48 (43,6)	
Nutritional assessment			
Yes	47 (65,3)	57 (52,3)	0,116
No	25 (34,7)	52 (47,7)	
Psychological assessment			
Yes	30 (41,7)	38 (34,5)	0,450
No	42 (58,3)	72 (65,5)	
Water intake			
Moderate	31 (43,1)	56 (50,5)	0,707
Normal	18 (25,0)	24 (21,6)	
Excessive	7 (9,7)	7 (6,3)	
Low	16 (22,2)	24 (21,6)	
Salt intake			
Moderate	41 (66,9)	65 (58,6)	0,817
Normal	9 (12,5)	11 (9,9)	
Excessive	0 (0,0)	1 (0,9)	
Low	22 (30,6)	34 (30,6)	

DISCUSSION

The results show a high percentage of symptoms indicative of depression, above 60%, which is in line with the literature and

acts as a subsidy for actions of renal unit teams towards reducing damages to these individuals' health. A study with hemodialysis patients showed that 71.1% had depressive symptoms, mostly mild⁽²⁹⁾. Depression scores are three to four times higher in patients with CKD compared to the general population and two to three times higher compared to individuals with other chronic diseases⁽³⁰⁾. This is possibly the result of disease burden and its imposed limitations, which include work, functional capacity and emotional state.

The analysis of patients' sociodemographic characteristics demonstrates they are similar to data from a Dutch study of patients in stages 2-5, in which 57% were men, mean age of 67.9 years, 58% were married and 84% were unemployed⁽³¹⁾. In the present study, the vast majority is retired and just over half are elderly, which shows the impact of the disease/treatment on the work situation. When observing the association between depressive symptoms and sociodemographic characteristics, appears the relationship with the female sex, as described in the literature⁽²²⁾. This may be due to biological and emotional aspects, coping strategies, social role and cultural issues related to gender.

No relationship was found between depressive symptoms and age, education, income and marital status. However, in publications, there is divergence between the higher prevalence of depression in younger⁽²⁵⁾ or elderly individuals⁽⁴⁾. Regarding educational level, no association with depressive symptoms was found in the literature either⁽¹⁶⁾. In relation to income, a study revealed that depressed patients had lower monthly income⁽³²⁾. Regarding marital status, a study with renal patients showed that living alone, being single or divorced are independent risk factors for depression⁽³³⁾. These evidences lead us to infer that better financial conditions result in fewer future concerns and that having a partner may favor coping.

The average time on hemodialysis among study participants was of 36.6 months, which is similar to a study from Australia, where the average time was 40.4 months⁽³⁴⁾. As in other investigations, in this study, dialysis time was not associated with depression^(3,19). Patients gradually develop strategies to live with the disease and come to perceive hemodialysis as a life alternative, even though the initial acceptance is difficult.

The high percentage of patients with more comorbidities and signs indicative of depression show the potential of disease overlap for emotional problems coupled with the need for prevention and control actions. In study participants, hypertension was the most common, followed by diabetes and heart failure. In a study, were evaluated combinations of chronic diseases in the elderly and the relationship with depression, and one comorbidity was found in 32.2% of them, two comorbidities in 22.4%, three in 12.4%, four in 4.3% and five in 1.0%, in addition to the high prevalence of hypertension and arthritis. Each associated chronic condition increased the level of depressive symptoms⁽³⁵⁾. Comorbidities intensify treatment demands and care and cause emotional repercussions, physical symptoms and limitations, which predisposes to depression.

In this study, there was no association between symptoms indicative of depression and complications of CKD or complications during the hemodialysis session, but there was a relationship with complications and symptoms after dialysis. In an investigation

with chronic end-stage renal patients undergoing dialysis and conservative treatment, was found an average of five or more symptoms per patient resulting from disease and treatment, and a higher number and severity in those with emotional disorders⁽⁹⁾. Symptoms after hemodialysis sessions and, more specifically, the overlap of symptoms, intensify the psychoemotional burden, which may extrapolate individual coping strategies.

Physical and emotional symptoms were also associated with depressive symptoms. Anxiety often manifests as somatic complaints together with those related to patients' clinic condition. Subjects with anxiety disorders have more severe disease, psychosocial impairment and poorer quality of life⁽³⁶⁾. A study with hemodialysis patients showed a strong correlation between anxiety and depression⁽⁵⁾. The diagnosis and treatment of anxiety can slow the progression to depression and favor the perception of other needs.

Data presented showed that more than half of patients with signs of depression reported fatigue. In a study, this symptom was present in 43% of participants, associated with depression and serum interleukin-6 levels⁽¹¹⁾. It is critical to identify fatigued patients and implement actions for self-care, lifestyle changes and adaptation to promote vitality.

As for sleep disorders and association with depressive symptoms, results are in agreement with those of a study with hemodialysis patients, in which patients with poorer sleep quality had higher scores indicative of depression⁽¹⁹⁾. Another study has shown that individuals undergoing dialysis have shorter total sleep time and rapid eye movement (REM) sleep compared to those on conservative treatment and volunteers. Chronic kidney disease patients showed lower sleep efficacy, their disorders were inversely related to hemoglobin and creatinine clearance, and positively related to phosphate⁽²⁰⁾. These data lead to the inference that disease and dialysis can trigger sleep disorders and are associated with signs of depression. The treatment of metabolic disorders may decrease the occurrence of these disorders.

In the present study, gastralgia was associated with symptoms of depression. This is in line with the literature, in which patients with gastrointestinal disorders were compared to healthy patients, and presented higher levels of anxiety, depression and prolonged exposure to stressors⁽³⁷⁾. In a study with CKD subjects, was found a higher number of gastrointestinal symptoms in those with glomerular filtration rate $<45\text{mL}/\text{min}/1.73\text{m}^2$, low protein intake and hypoalbuminemia⁽³⁸⁾. Hence the conclusion that interventions capable of promoting proper diet adherence and decreased stressors may reduce gastrointestinal symptoms.

Irritability characterized by anger-prone mood in response to minimal insults, rude or vindictive behavior is a common symptom, particularly in individuals with Bipolar and Major Depressive Disorder⁽²⁾. In this study, irritability was reported by 46.8% of patients, which warns of the severity of signs indicative of depression and other emotional disorders. A study with patients with major depressive episodes found irritability in 32.3% of them, moderately correlated with hypomania, anxiety and emotional reactivity, and independently associated with irritable temperament, mixed depressive states and depression⁽¹²⁾. Practices with instrumental music, manual activities and physical exercises can be performed both during dialysis and at home to alleviate this symptom.

Participants with symptoms indicative of depression also presented sadness, which is according to information provided in the Diagnostic and Statistical Manual of Mental Disorders. Sadness is perceived as part of life, but related to depressive disorders when combined with four other symptoms for more than two weeks⁽²⁾. A study with hemodialysis patients and family members showed they relate depression to sadness, isolation and bad thoughts linked to CKD⁽¹³⁾. The restrictions imposed by the disease/treatment and changes in routine can lead to sadness and develop into depression, which demonstrates the importance of actions that help with adaptation.

Suicidal ideation was reported by 14.4% of patients with depressive symptoms in this study, which requires immediate action and follow-up by the multidisciplinary team. In a study conducted in Lebanon, suicidal ideation was found in 37% of patients with CKD, 31% at low risk and 6% at moderate risk. Authors observed a correlation of comorbidities with depression and suicidal ideation, with odds ratios of 4.3 and 5.8, respectively⁽¹⁴⁾. In a Brazilian study with hemodialysis and transplant patients, suicidal ideation was observed in 4% of hemodialysis patients and 6% of transplant recipients⁽¹⁵⁾. Group therapies with cognitive approach and conflict resolution may decrease depressive symptoms and suicidal ideation, and pharmacological treatment may also be an option.

In the present study, leisure was not associated with symptoms indicative of depression. On the contrary, physical inactivity was strongly associated with depression, which shows the importance of physical exercise as prevention. In this sense, a study with men undergoing hemodialysis evaluated the effects of an endurance-resistance training program. Results showed improvement in physical capacity, blood pressure, high and low density cholesterol, triglycerides, decreased anxiety and depression⁽²⁴⁾. Given the benefits of physical activity, the motivation of patients and implementation of exercise programs should become reality in dialysis units.

Functional capacity for basic activities of daily living such as bathing, dressing and walking, and for instrumental tasks such as using the telephone, cleaning the house and others, may be impaired by the disease and by hemodialysis and depression. Most patients in this study stopped performing usual activities, and more than half mentioned needing help in daily tasks, which was associated with depressive symptoms. A Korean study with patients on renal replacement therapy showed an association between renal function and disability or functional status in older adults. Results showed higher difficulties with basic activities of daily living and instrumental activities with the decrease of glomerular filtration rate, and higher mortality as a consequence⁽²⁶⁾.

A study of patients with CKD stages 3-5 and a control group (patients at similar cardiovascular risk without CKD) showed worse scores in the former, related to disability and general functionality. Results indicated age, stage of kidney disease, coronary heart disease and depression as predictors of disability and general functioning⁽²⁷⁾. These results reinforce the importance of physical exercise to improve functional capacity and especially, to prevent patient mortality.

The results of the present investigation showed no association between nutritional and psychological assessment with depressive symptoms, but follow-up over time, in addition to timely interventions, may affect the reduction of symptoms of depression and nutritional status. Water and salt intake were not associated with

depression either, but research with CKD patients showed lower adherence to the recommended diet in depressed patients⁽²⁵⁾. Long-term multiprofessional practice focused on patient education and emphasis on the management of signs/symptoms and self-care can modify their behavior in relation to the disease and treatment.

In summary, as depressive symptoms in CKD patients are associated with numerous factors, the diagnosis requires skills. The implementation of prevention measures and treatment of associated factors is the responsibility of the health team and particularly, of nursing.

Study limitations

The limitations of the study were not evaluating the direct impact of the studied variables on mortality, particularly depression, and the punctual analysis of the association between depressive symptoms and nutritional and psychological assessment.

Contribution to the area of nursing, health or public policy

This study is relevant for nursing and the multiprofessional team, as its results may stimulate health practices aimed at the care of chronic renal patients in order to modify depression scores, promote well-being and, therefore, reduce morbidity and mortality.

CONCLUSION

Signs indicative of depression in CKD patients undergoing hemodialysis are related to the burden of associated diseases, symptoms and functional dependence. Patient care requires multiprofessional care with health promotion actions, prevention of risk factors, treatment of comorbidities and complications after hemodialysis, with inclusion of family members. Physical exercises are effective strategies to decrease depressive symptoms and promote the quality of life of this population.

REFERENCES

1. World Health Organization-WHO. Depression and Other Common Mental Disorders Global Health Estimates [Internet]. Geneva: WHO; 2017 [cited 2017 Dec 05]. Available from: <http://apps.who.int/iris/bitstream/10665/254610/1/WHO-MSD-MER-2017.2-eng.pdf>
2. DSM-5. Manual diagnóstico e estatístico de transtornos mentais [Internet]. 5th ed. Porto Alegre: Artmed; 2014 [cited 2017 Dec 01]. Available from: <http://aempreendedor.com.br/wpcontent/uploads/2017/04/ManualDiagn%C3%B3stico-e-Estat%C3%ADstico-de-Transtornos-Mentais-DSM-5.pdf>
3. Teles F, Azevedo VF, Miranda CT, Miranda MP, Teixeira Mdo C, Elias RM. Depression in hemodialysis patients: the role of dialysis shift. *Clinics* [Internet]. 2014 [cited 2017 Dec 05];69(3):198-202. Available from: <http://www.scielo.br/pdf/clin/v69n3/1807-5932-clin-69-03-198.pdf>
4. Turkistani I, Nuqali A, Badawi M, Taibah O, Alserihy O, Morad M, et al. The prevalence of anxiety and depression among end-stage renal disease patients on hemodialysis in Saudi Arabia. *Ren Fail* [Internet]. 2014 [cited 2017 Dec 02];36(10):1510-5. Available from: <https://doi.org/10.3109/0886022X.2014.949761>
5. Hou Y, Li X, Yang L, Liu C, Wu H, Xu Y, et al. Factors associated with depression and anxiety in patients with end-stage renal disease receiving maintenance hemodialysis. *Int Urol Nephrol* [Internet]. 2014 [cited 2017 Dec 05];46(8):1645-49. Available from: <https://link.springer.com/article/10.1007%2Fs11255-014-0685-2>
6. Webster AC, Nagler EV, Morton RL, Masson P. Chronic Kidney Disease. *Lancet* [Internet]. 2017 [cited 2017 Dec 02];389(1):1238-52. Available from: [http://dx.doi.org/10.1016/S0140-6736\(16\)32064-5](http://dx.doi.org/10.1016/S0140-6736(16)32064-5)
7. Sesso RC, Lopes AA, Thomé FS, Lugon JR, Martins CT. Brazilian Chronic Dialysis Survey 2016. *J Bras Nefrol* [Internet]. 2017 [cited 2017 Dec 06];39(3):261-6. Available from: <http://dx.doi.org/10.5935/0101-2800.20170049>
8. Roxo NE, Barata RC. Dyadic relationship and quality of life patients with chronic kidney disease. *J Bras Nefrol* [Internet]. 2015 [cited 2017 Dec 05];37(3):315-22. Available from: <http://dx.doi.org/10.5935/0101-2800.20150051>
9. Wan Zukiman WZH, Yaakup H, Zakaria NF, Shah SAB. Symptom prevalence and the negative emotional states in end-stage renal disease patients with or without renal replacement therapy: a cross-sectional analysis. *J Palliat Med* [Internet]. 2017 [cited 2017 Dec 02];20(10):1127-34. Available from: <http://dx.doi.org/10.1089/jpm.2016.045>
10. Palmieri GA, Oller GASAO, Eid LP, Pompeo DA, Lima CEQ, Balderrama LP. Anxious and depressive symptoms in hemodialytic treatment patients. *Rev Enferm UFPE* [Internet]. 2017 [cited 2017 Dec 05];11(11):4360-8. Available from: 10.5205/reuol.23542-49901-1-ED.1111201712
11. Bossola M, Di Stasio E, Giungo S, Rosa F, Tazza L. Fatigue Is Associated With Serum Interleukin-6 Levels and Symptoms of Depression in Patients on Chronic Hemodialysis. *J Pain Symptom Manage* [Internet]. 2015 [cited 2017 Dec 03];49(3):578-85. Available from: 10.1016/j.jpainsymman.2014.07.009
12. Parneix M, Péricaud M, Clément JP. Irritability Associated With Major Depressive episodes: its relationship with mood disorders and temperament. *Turk Psikiyatri Derg* [Internet]. 2014 [cited 2017 Dec 03];25(2):106-13. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/24936757>
13. Coutinho MPL, Costa FG. Depressão e insuficiência renal crônica: uma análise psicossociológica. *Psicol Soc* [Internet]. 2015 [cited 2017 Dec 05];27(2):449-59. Available from: <http://dx.doi.org/10.1590/1807-03102015v27n2p449>
14. Macaron G, Fahed M, Matar D, Bou-Khalil R, Kazour F, Nehme-Chlela D, et al. Anxiety, Depression and suicidal ideation in lebanese patients undergoing hemodialysis. *Community Ment Health J* [Internet]. 2014 [cited 2017 Dec 05];50(1):235-8. Available from: <http://dx.doi.org/10.1007/s10597-013-9669-4>
15. Andrade SV, Sesso R, Diniz DHMP. Hopelessness, suicide ideation, and depression in chronic kidney disease patients on hemodialysis or transplant recipients. *J Bras Nefrol* [Internet]. 2015 [cited 2017 Dec 05];37(1):55-63. Available from: <http://dx.doi.org/10.5935/0101-2800.2015000>

16. Dias DR, Shiozawa P, Miorin LA, Cordeiro Q. Prevalência de sintomas depressivos e ansiosos em pacientes com doença renal crônica em programa de hemodiálise: um estudo transversal. *Arq Med Hosp Fac Cien Med* [Internet]. 2015 [cited 2017 Dec 05];60(2):65-71. Available from: <http://arquivosmedicos.fcmsantacasasp.edu.br/index.php/AMSCSP/article/view/152/161>
17. Ozcan H, Yucel A, Avşar UZ, Cankaya E, Yucel N, Gözübüyük H, et al. Kidney transplantation is superior to hemodialysis and peritoneal dialysis in terms of cognitive function, anxiety, and depression symptoms in chronic kidney disease. *Transplantation Proc* [Internet]. 2015 [cited 2017 Dec 05];47(5):1348-51. Available from: <https://doi.org/10.1016/j.transproceed.2015.04.032>
18. Chong VH, Tan J. Prevalence of gastrointestinal and psychosomatic symptoms among Asian patients undergoing regular hemodialysis. *Nephrology* [Internet]. 2013 [cited 2017 Dec 05];18(2):97-103. Available from: <https://doi.org/10.1111/nep.12000>
19. Trbojević-Stanković J, Stojimirović B, Bukumirić Z, Hadzibulić E, Andrić B, Djordjević V, et al. Depression and quality of sleep in maintenance hemodialysis patients. *Srp Arh Celok Lek*. Jul/Aug 2014;142(7-8):437-43.
20. Ezzat, Haitham; Mohab, Amr. Prevalence of sleep disorders among ESRD patients. *Ren Fail* [Internet]. 2015 [cited 2017 Dec 07];37(6):1013-19. Available from: <http://dx.doi.org/10.3109/0886022X.2015.10444012015>
21. Silva Jr GB, Daher EF, Buosi AP, Lima RS, Lima MM, Silva EC, et al. Depression among patients with end-stage renal disease in Hemodialysis. *Psychol Health Med* [Internet]. 2014 [cited 2017 Dec 07];19(5):547-51. Available from: <http://dx.doi.org/10.1080/13548506.2013.845303>
22. Moura Neto JA, Souza AFP, Moura DQ, Oliveira GM, Paschoalin SP, Paschoalin EL, et al. Modalidade de terapia renal substitutiva como preditora de sintomas depressivos. *J Bras Psiquiatr* [Internet]. 2014 [cited 2017 Dec 05];63(4):354-9. Available from: <http://dx.doi.org/10.1590/0047-2085000000045>.
23. Kim Y, Kopple J. Prevalence of depressive symptoms and associated factors in people with low estimated glomerular filtration rate: findings from a South Korea National Survey. *Nephrol Nurs J* [Internet]. 2015 [cited 2017 Dec 05];42(3):269-77. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/26207287>
24. Frih B, Jaafar H, Mkacher W, Ben Salah Z, Hammami M, Frih A. The effect of interdialytic combined resistance and aerobic exercise training on health related outcomes in chronic hemodialysis patients: the tunisian randomized controlled study. *Front Physiol* [Internet]. 2017 May [cited 2017 Dec 08];31(8):288. Available from: <http://dx.doi.org/10.3389/fphys.2017.00288>
25. Yu M, Katon W, Young B. Diabetes self-care, major depression, and chronic kidney disease in an outpatient diabetic population. *Nephron Clin Pract* [Internet]. 2013 [cited 2017 Dec 10];124(1):106-12. Available from: <http://dx.doi.org/10.1159/000355551>
26. Chin HJ, Ahn SY, Ryu J, Kim S, Na KY, Kim KW, et al. Renal function and decline in functional capacity in older adults. *Age Ageing* [Internet]. 2014 [cited 2017 Dec 07];43(1):833-8. Available from: <http://dx.doi.org/10.1093/ageing/afu07>
27. Seidel UK, Gronewold J, Volsek M, Todica O, Kribben A, Bruck H, et al. Physical, Cognitive and emotional factors contributing to quality of life, functional health and participation in community dwelling in chronic kidney disease. *PLoS ONE* [Internet]. 2014 [cited 2017 Dec 10];9(3):e91176. Available from: <http://dx.doi.org/10.1371/journal.pone.0091176>
28. Conselho Nacional de Saúde (BR). Resolução nº 466 de 12 de dezembro de 2012. [Internet]: Ministério da Saúde; 2012 [cited 2017 Oct 21]. Available from: <http://conselho.saude.gov.br/resolucoes/2012/Reso466.pdf>.
29. Schuster JT, Feldens VP, Iser BPM, Ghislandi GM. Avaliação de sintomas depressivos em pacientes com insuficiência renal crônica submetidos à hemodiálise em Tubarão – Santa Catarina – Brasil. *Rev AMRIGS* [Internet]. 2015 [cited 2017 Dec 05];59(1):15-9. Available from: http://www.amrigs.com.br/revista/5901/03_1457_Revista%20AMRIGS.pdf
30. Shirazian S, Grant CD, Aina O, Mattana J, Khorassani F, Ricardo AC. Depression in chronic kidney disease and end-stage renal disease: similarities and differences in diagnosis, epidemiology, and management. *Kidney Int Rep* [Internet]. 2017 [cited 2017 Dec 10];2(1):94-107. Available from: <http://dx.doi.org/10.1016/j.ekir.2016.09.005>
31. Loosman WL, Rottier MA, Honig A, Siegert CE. Association of depressive and anxiety symptoms with adverse events in Dutch chronic kidney disease patients: a prospective cohort study. *BMC Nephrol* [Internet]. 2015 [cited 2017 Dec 05];21(16):155. Available from: <http://dx.doi.org/10.1186/s12882-015-0149-7>
32. Liu X, Yang X, Yao L, Zhang Q, Sun D, Zhu X, et al. Prevalence and related factors of depressive symptoms in hemodialysis patients in northern China. *BMC Psychiatry* [Internet]. 2017 [cited 2017 Dec 10];17:128. Available from: <http://dx.doi.org/10.1186/s12888-017-1294-2>
33. Yoong RK, Mooppil N, Khoo EY, Newman SP, Lee VY, Kang AW, et al. Prevalence and determinants of anxiety and depression in end stage renal disease (ESRD). A comparison between ESRD patients with and without coexisting diabetes mellitus. *J Psychosom Res* [Internet]. 2017 [cited 2017 Dec 05];94(1):68-72. Available from: <http://dx.doi.org/10.1016/j.jpsychores.2017.01.009>
34. Chan R, Dear BF, Titov N, Chow J, Suranyi M. Examining internet-delivered cognitive behavior therapy for patients with chronic kidney disease on hemodialysis: a feasibility open trial. *J Psychosom Res* [Internet]. 2016 Oct [cited 2017 Dec 09];89(1):78-84. Available from: <https://doi.org/10.1016/j.jpsychores.2016.08.012>
35. Pruchno R, Wilson-Genderson M, Heid A. Multiple chronic condition combinations and depression in community-dwelling older adults. *J Gerontol A Biol Sci Med Sci* [Internet]. 2016 [cited 2017 Dec 10];71(7):910-15. Available from: <http://dx.doi.org/10.1093/gerona/glw025>
36. Cukor D, Ver Halen N, Fruchter Y. Anxiety and quality of life in ESRD. *Semin Dial* [Internet]. 2013 [cited 2017 Dec 05];26(3):265-8. Available from: <http://dx.doi.org/10.1111/sdi.12065>
37. Faruqui AA. Anxiety induced refractory gastrointestinal disorders. *J Liver Res Disord Ther* [Internet]. 2017 [cited 2017 Dec 10];3(4):90-3. Available from: <http://dx.doi.org/10.15406/jlrtd.2017.03.00062>
38. Zhang X, Bansal N, Go AS, Hsu C. Gastrointestinal symptoms, inflammation and hypoalbuminemia in chronic kidney disease patients: a cross-sectional study. *BMC Nephrol* [Internet]. 2015 [cited 2017 Dec 08];16:211. Available from: <http://dx.doi.org/10.1186/s12882-015-0209-z>