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# 7 ASSOCIATION BETWEEN STRESS/ANXIETY, DEPRESSION, PAIN AND QUALITY OF LIFE IN PEOPLE WITH CHRONIC KIDNEY DISEASE

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## ABSTRACT

**BACKGROUND:** Chronic kidney disease patients undergoing hemodialysis have a high symptom burden that contributes to increased suffering and diminishes their quality of life. Cardiovascular, musculoskeletal and psychosocial disorders affect their physical and functional capacity anxiety, stress and depression.

**AIM:** To determine the prevalence of stress/anxiety and depression in people with chronic kidney disease and to verify the association between stress/anxiety and depression with pain and quality of life.

**METHODS:** A cross-sectional, descriptive and correlational study; A random sample of 183 patients who underwent hemodialysis; application of the depression and stress anxiety scale (DASS-21), brief pain inventory (BPI), and Medical Outcomes Study Short-Form 12-Item Health Survey (SF-12).

**RESULTS:** The sample consisted mostly of men (59.6%), married (53.8%), Portuguese nationality (78.7%), mean age 59.17 years (SD ± 14.64), hemodialysis treatment 70.9 months (SD ± 54.2). 76% were retired and 24% had a regular job. The prevalence of stress and anxiety was 24% and depression was 37.2%.

**CONCLUSIONS:** Stress / anxiety and depression are prevalent in people with chronic kidney disease. Stress / anxiety and depression are associated with high levels of pain, which impacts on activities of daily living, presenting low levels of quality of life in the physical and mental components.

**KEYWORDS:** Quality of life; Depression; Anxiety; Chronic renal insufficiency

## RESUMEN

### “Asociación entre estrés / ansiedad, depresión, dolor y calidad de vida en personas con enfermedad renal crónica”

**CONTEXTO:** Las personas con enfermedad renal crónica en hemodiálisis presentan una elevada carga de síntomas que contribuyen para aumentar el sufrimiento y disminuir su calidad de vida. Presentan varios problemas cardiovasculares, musculoesqueléticos y psicosociales que afectan a su capacidad física y funcional, pudiendo aumentar la ansiedad, el estrés y la depresión.

**OBJETIVO(S):** Determinar la prevalencia de estrés / ansiedad y depresión en personas con enfermedad renal crónica y verificar la asociación entre el estrés / ansiedad y la depresión con el dolor y la calidad de vida.

**MÉTODOS:** Estudio transversal, descriptivo y correlacional, Muestra aleatoria compuesta por 183 pacientes en hemodiálisis; aplicación de la escala de ansiedad depresión y estrés (DASS-21), inventario breve de dolor (BPI) y Medical Outcomes Study Short-Form 12-Item Health Survey (SF-12).

**RESULTADOS:** La muestra consistió principalmente en hombres (59,6%), casados (53,8%), de nacionalidad portuguesa (78,7%); con edad media de 59,17 años (DP ±14,64), haciendo tratamiento hemodialítico hace 70,9 meses (DP ±54,2). El 76% estaba reformado y el 24% tenía un empleo regular. La prevalencia del estrés y la ansiedad fue del 24% y de la depresión fue del 37,2%.

**CONCLUSIONES:** El estrés / ansiedad y depresión son prevalentes en personas con enfermedad renal crónica. El estrés / ansiedad y depresión están asociados a altos niveles de dolor, que afectan las actividades de la vida diaria, y a bajos niveles de calidad de vida en los componentes físico y mental.

**DESCRIPTORES:** Calidad de vida; Depresión; Ansiedad; Insuficiencia renal crónica

## RESUMO

### “Associação entre stress/ansiedade, depressão, dor e qualidade de vida em pessoas com doença renal crónica”

**CONTEXTO:** As pessoas com doença renal crónica, em programa de hemodiálise, apresentam sintomas que contribuem para aumentar o sofrimento e diminuir a sua qualidade de vida. Apresentam vários problemas cardiovasculares, músculo-esqueléticos e psicossociais que afetam a sua capacidade física e funcional, podendo aumentar a ansiedade, stresse e depressão.

**OBJETIVO(S):** Determinar a prevalência de stresse / ansiedade e depressão em pessoas com doença renal crónica e verificar a associação entre o stresse / ansiedade e depressão com a dor e a qualidade de vida.

**MÉTODOS:** Estudo transversal, descriptivo e correlacional, Amostra aleatória composta por 183 utentes em programa de hemodiálise; aplicação da escala de ansiedade, depressão e stresse (DASS-21), inventário breve de dor e Medical Outcomes Study Short-Form 12-Item Health Survey (SF-12).

**RESULTADOS:** A amostra foi maioritariamente constituída por homens (59,6%), casados (53,8%), de nacionalidade portuguesa (78,7%), com média de idade de 59,17 anos (DP ±14,64), sob tratamento hemodialítico há 70,9 meses (DP ±54,2). 76% estavam reformados e 24% tinham um emprego regular. A prevalência do stresse e ansiedade foi de 24% e da depressão foi de 37,2%.

**CONCLUSÕES:** O stresse/ansiedade e depressão são prevalentes em pessoas com doença renal crónica. O stresse/ansiedade e depressão estão associados a altos níveis de dor, com impacto nas atividades da vida diária, e a baixos níveis de qualidade de vida nos componentes físico e mental.

**PALAVRAS-CHAVE:** Qualidade de vida; Depressão; Ansiedade; Insuficiência renal crónica

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## INTRODUCTION

Chronic kidney disease (CKD) was defined as a decreased kidney function shown by glomerular filtration rate (GFR) of less than 60 ml/min per 1.73 m<sup>2</sup>, or markers of kidney damage, or both, with a duration of at least 3 months, regardless of the underlying pathology (Webster, Nagler, Morton & Masson, 2017).

The prevalence of CKD has increased in the last 25 years and it is associated with aging and epidemiological changes, namely those related with noncommunicable diseases such as diabetes and hypertension (Xie et al., 2018). The prevalence of all stages of CKD varies between 7 to 12% worldwide. In Europe, the prevalence ranges from 2.3% in Germany, 2.4% in Finland, 4.0% in Spain to 5.2% in England (Romagnani et al. 2017). However, it is estimated that the prevalence of CKD varies both within the same country and between countries (Glasscock, Warnock, & Delanaye, 2017).

Globally, between the years of 1990 and 2016, the incidence of CKD increased by 89%, the prevalence increased by 87%, the mortality increased by 98%, and the disability-adjusted life years (DALYs) increased by 62% (Xie et al., 2018).

The person with chronic kidney disease undergoing hemodialysis has a high symptom burden that contributes to increased suffering and diminishes their quality of life (Gutiérrez Sánchez, Leiva-Santos, Sánchez-Hernández, & Gómez García, 2015). These patients have cardiovascular, musculoskeletal and psychosocial disorders that affect their physical and functional capacity (Barbero Narbona et al., 2016). A review of 55 articles published between 1992 and 2009 analyzed the prevalence of pain in hemodialysis patients (with 36 studies examining over 5200 patients) and showed that over 58% of CKD patients experience pain and 49% of patients rate their pain as moderate or severe (Davison, Koncicki, & Brennan, 2014). They also have symptoms and emotional disorders such as anxiety and depression (Gómez Vilaseca, Pac Gracia, Manresa Traguany, Lozano Ramírez, & Chevarria Montesinos, 2015) including stress. Depressive and anxiety symptoms are common amongst individuals with chronic kidney disease and are known to affect quality of life adversely (Pascoe, Thompson, Castle, McEvedy, & Ski, 2017). CKD patients with symptoms of depression, anxiety and stress had poorer quality of life than those without, highlighting the negative impact of psychological symptoms in these patients (Bujang et al., 2015).

The aim of this study was to determine the prevalence of stress/anxiety and depression in people with chronic kidney disease and to verify the association between stress/anxiety and depression with pain and quality of life.

## METHODS

This is a cross-sectional, descriptive and correlational study. A representative sample of 183 people with CKD who underwent hemodialysis in two clinics and one hospital unit in the region of Lisbon, Portugal, was obtained.

The inclusion criteria defined for the population were: people undergoing HD routinely for at least six months and aged 18 years or over. Exclusion criteria were: people with cognitive impairment and active psychiatric illness. Information regarding these conditions was obtained through medical records.

Data was collected from March to June 2015. Interviews were performed by five trained nurses during the HD session. One of the researchers met with these nurses to explain the objectives and the process of data collection, followed by a written roadmap to assist in completing the data collection instruments.

The data collection instrument consisted of sociodemographic and health variables, as well as, the depression anxiety and stress scale (DASS-21) (Lovibond, & Lovibond, 1995; Pais-Ribeiro, Honrado, & Leal, 2004; Sousa et al., 2017a) and brief pain Inventory (BPI), and Medical Outcomes Study Short-Form 12-Item Health Survey (SF-12) (Sousa, Marques-Vieira, Severino, Pozo-Rosado, & José, 2017c). The DASS-21 consists of 21 items distributed in equal numbers by three scales, depression, anxiety and stress. The subscale depression is related to the following concepts: depression and dysphoria (one item); discouragement, (one item); devaluation of life (one item); self-depreciation (one item); lack of interest or involvement (one item); anhedonia (one item); inertia (one item); the subscale is constituted by the following concepts: anxiety and autonomous system excitation (three items); musculoskeletal effects (one item); situational anxiety (one item); subjective anxiety experiences (two items); the subscale stress refers to the concepts: difficulty in relaxing two items); nervous excitement (one item); easily agitated/upset (one item); irritable/exaggerated reaction (two items); and impatience (one item). Each item is characterized by a statement which refers to negative emotional symptoms.

It intends to evaluate the extent to which they have experienced each symptom during the last week on a four-points Likert scale of severity or frequency: “It did not apply to me at all” to “It applied to me most of the time”. The highest scores on each scale refer to more negative affective states (Lovibond & Lovibond, 1995; Pais-Ribeiro, Honrado, & Leal, 2004). The DASS 21 in patients with CKD has a two-dimensional model “Depression” and “Stress / Anxiety” with valid and reproducible measurements (Sousa et al., 2017a).

SF-12 (Ferreira-Valente, Pais Ribeiro, & Jensen, 2012) is a health questionnaire developed in the United States of America, validated for several countries from different continents. It measures the perception of health-related QoL through the use of 12 items with a resumed physical and mental component in which the constructs are evaluated on a Likert type scale from three to five points (Sousa, Antunes, Marques-Vieira, Valentim, & José, 2017b). The version translated and adapted to Portuguese showed reliability and satisfactory validity (Ferreira-Valente et al., 2012).

The abbreviated BPI version consists of a diagram to register the location of the pain on a human figure, and of scales to assess the intensity and impact of pain. Pain intensity is recorded through numerical scales ranging from 0 (no pain) to 10 (the worst possible pain) and by a set of statements about life activities, general activity, mood, ability to walk, work, social relations, sleep capacity and fun, measured on a scale with ten values (from no interference (zero) to complete interference (ten)) (Ferreira-Valente et al., 2012; Sousa et al., 2017c). The Portuguese version of BPI in people with CKD presented two factors, namely pain interference and pain severity, with internal consistency with Cronbach's alpha value of 0.826 and 0.91 respectively (Sousa et al., 2017c).

Data were analyzed with descriptive and inferential statistics using the Statistical Package for Social Sciences (SPSS) 20.0 statistical software. Data obtained by SF-12 was analyzed using the Quality Metric Health Outcomes™ Scoring Software 4.5. The cut-off scores have been developed for defining mild/moderate/severe/extremely severe scores for each DASS scale (Lovibond & Lovibond, 1995). For the study of the association the Pearson correlation coefficient was used. The level of significance adopted was  $p < 0.05$ .

Retrospective license was obtained for the use of SF-12 (license No QM030904).

This study was approved by the ethics committee of the two health organizations, approval No 1/2015 of the ethics committees of Diaverum and approval No 175/2015 of the ethics committees of the Centro Hospitalar Lisboa Central. Both the purpose of the study, and the guaranteed confidentiality of data with the right to withdraw without risk to oneself were explained to the people with CKD. Informed consent was therefore obtained from those who met the inclusion criteria and agreed to participate.

## RESULTS

The sociodemographic characteristics of participants were: male (59.6%); mean age of 59.17 years old (SD = 14.64). 78.7% had Portuguese nationality and the remaining were from an African country as follows: Cape Verde 13.7%; São Tomé 3.3%; Angola 2.2% and Guinea 1.6%, and other 0.5%. Concerning the educational level, 3.3% were illiterate, 41.1% had the 4th grade, 18.9% the 6th grade, 15% the 9th grade, 12.2% the 12th grade and 9.4% have completed higher education. Regarding their marital status, most were married (53.8%), 28% were single, 11.5% widowers and 6.6% were divorced. About 76% were retired, only 24% had a regular professional activity. With regards to health data, the subjects were undergoing HD for about 70.9 months ( $\pm 54.2$ ), 61.9% had hypertension and 25.8% had diabetes.

The prevalence of stress and anxiety is 24% and depression is 37.2%. Depression was classified as mild (5-6) in 10.9% of the sample, moderate (7-10) in 15.3%, severe (11-13) in 5.5% and extremely severe ( $>14$ ) in 5.5%. Stress/Anxiety was mild (11-15) in 14.2%, moderate (16-20) in 3.8%, severe (21-26) in 4.9% and extremely severe ( $>27$ ) in 1.1%.

Stress and anxiety had a significant positive correlation with depression ( $r = 0.729$ ,  $p < 0.001$ ), with pain severity ( $r = 0.243$ ,  $p < 0.05$ ), pain interference ( $r = 0.508$ ,  $p < 0.001$ ) and negative with the physical ( $r = -0.167$ ,  $p < 0.05$ ) and mental ( $r = -0.477$ ;  $p < 0.001$ ) components of quality of life. Depression was positively and significantly associated with pain severity ( $r = 0.248$ ,  $p < 0.01$ ) and pain interference ( $r = 0.562$ ,  $p < 0.001$ ), but negatively with the physical ( $r = -0.199$ ;  $p < 0.05$ ) and mental ( $r = -0.516$ ;  $p < 0.01$ ) components of quality of life. The physical component of quality of life is positively associated with the mental component of quality of life ( $r = 0.200$ ;  $p < 0.001$ ) and negatively with pain severity ( $r = -0.341$ ;  $p < 0.001$ ) and pain interference ( $r = 0.413$ ;  $p < 0.001$ ).

The mental component is negatively correlated with pain interference ( $r = -0.445$ ;  $p < 0.001$ ), and finally the severity of pain is positively associated with pain interference ( $r = 0.533$ ,  $p < 0.001$ ).

Tabela 1 - Pearson correlation coefficient between the dimensions stress and anxiety, depression, physical component quality of life, mental component quality of life, pain severity and pain interference

	Stress and Anxiety (DASS)	Depression (DASS)	Quality of Life (Physical Component)	Mental Component Quality of Life	Pain Severity
Stress and Anxiety (DASS)					
Depression (DASS)	0.729***				
Physical Component Quality of Life	-0.167*	-0.248**			
Mental Component Quality of Life	-0.477***	-0.562***	0.200**		
Pain Severity	0.243*	0.199*	-0.341***	-0.177	
Pain Interference	0.508***	0.516**	-0.413***	-0.445***	0.533***

Legend: \*  $p < 0,05$ ; \*\*  $p < 0,01$ ; \*\*\* $p < 0,001$ .

## DISCUSSION

The present study shows a prevalence of depression, anxiety and stress amongst hemodialysis patients. These results are in line with other studies reported in a systematic review and meta-analysis in which depressive symptoms are common in adults with CKD (Palmer et al., 2013). Other authors have reported the prevalence of psychological symptoms (depression and anxiety) and their relationship with a poor quality of life among these patients (Bujang et al., 2015; Gerogianni, Lianos, Kouzoupis, Polikandrioti, & Grapsa, 2018).

In the study where Gerogianni is the first author (2018) the results indicated a significant correlation between anxiety and depression levels in hemodialysis subjects. Participants with high levels of anxiety had higher levels of depression. This situation is also confirmed in this study, as higher values of depression are associated with higher values of stress and anxiety.

Still, Yoong in co-authoring (2017) found in two studies performed in people with end-stage renal disease that a total of 233 participants (45.4%) reported elevated anxiety symptoms and 256 (49.9%) had high depressive symptoms. In a study of people with CKD, the prevalence of anxiety was 36.5% and depression of 27% (Montilla, Duschek & del Paso, 2016)

The three psychological symptoms (stress, anxiety and depression) are associated with higher pain values and lower values of quality of life in both physical and mental components. We can observe other studies in which depressive and anxious symptoms are common among individuals with CKD and are known to negatively affect the quality of life (Bujang et al., 2015; Pascoe, Thompson, Castle, McEvedy, & Ski, 2017).

On the other hand, anxiety and depression are the best predictors of the physical and mental component of quality of life (Montilla et al., 2016).

A Portuguese study with 172 people with CKD on hemodialysis verified that chronic pain occurs in 54.1% of patients and intradialytic pain in 75%, and the causes of pain were musculoskeletal (69.3%) (Sousa et al., 2018). In a study involving people with chronic disease (including CKD) it was found that the higher the level of comorbidity (diabetes, neurological sequelae, among others), the greater the prevalence of depressive symptoms and the higher the level of pain experienced (Sharpe et al., 2017). Similar results were reported in a study in the UK and Ireland involving 893 people on dialysis, who found low levels of quality of life, and a prevalence of pain in 64% of these people. Decreased quality of life was explained by the loss of mobility, pain, depression, diarrhea, drowsiness and loss of appetite (Lowney et al., 2015).

## CONCLUSIONS

CKD has become a complex public health problem. During the course of the disease, the impact of the diagnosis, the coexistence with the disease and the beginning of the treatment are situations of stress and anxiety that affect the quality of life. Therefore, knowledge about CKD is essential to solve people's health problems. This study contributed to identify the prevalence of stress, anxiety and depression in people with CKD and the association with pain and quality of life.

All psychological variables (stress, anxiety and depression) had a significant and negative impact on the dimensions of quality of life (physical and mental).

People with symptoms of depression, anxiety and stress had worse quality of life than those without symptoms, which highlights the negative impact on pain severity and interference and shows the need for intervention. Stress, anxiety and depression are more prevalent in people with CKD. High levels of stress, anxiety and depression are associated with high levels of pain causing an impact on activities of daily living, and consequently lowering levels of quality of life in the physical and mental components. Nurses should develop strategies to improve the mental health of people with CKD in order to improve their quality of life.

### IMPLICATIONS FOR CLINICAL PRACTICE

People on dialysis have experienced psychological symptoms such as depression, anxiety and stress, affecting their quality of life, requiring intervention. Being the nurse a key player, integrating the multi-professional team, responsible for the care of people with CKD, it is important to bear in mind that one of the main objectives of the nursing intervention is to provide maximum well-being and quality of life. The prevalence of stress, anxiety and depression and the association of these variables with a poorer quality of life underlies the importance of a psychotherapeutic nursing intervention in the scope of mental health during the dialysis treatment. This intervention must always be based in the therapeutic relationship and interpersonal communication between the nurse and the person (Sampaio, Sequeira, & Lluch Canut, 2018).

The psychotherapeutic interventions of the nurse specialist in mental and psychiatric health, may reduce depressive symptoms, stress and anxiety (Sampaio, Araújo, Sequeira, Lluch Canut, & Martins, 2018) and consequently improve the quality of life in people with CKD and their family caregivers. Also, humor intervention in nursing performed in people with CKD improved quality of life and subjective well-being, and decreased depressive symptoms (Sousa, 2018). Nevertheless, studies indicate the need of further research in this field (Pascoe et al., 2017).

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