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Original Research

Pain, Anxiety, and Depression in Patients Undergoing Chronic Hemodialysis Treatment: A Multicentre Cohort Study



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ABSTRACT

Background: Pain is a considerable health concern that interferes with hemodialysis treatment outcomes and can lead to a patient developing anxiety and depression.

Aims: To examine the perception of pain in patients on chronic hemodialysis therapy, and to analyze the relationship between their pain, anxiety, depression, and sociodemographic data.

Method: The research was conducted using a quantitative, observational, cross-sectional design. The study recruited 138 patients from multicentered hemodialysis units. A battery of questionnaires, including the visual analog scale (VaS) as pain intensity scale, the Hospital Anxiety and Depression Scale (HADS), and an ad hoc sociodemographic data questionnaire, were given to patients to answer during their hemodialysis sessions. A linear regression analysis was conducted to obtain the results.

Results: The mean of pain to all participants was generally low, as per AVS scale (0–10) it was 3.6 (standard deviation [SD] = 3.07). Women manifested lower levels of pain than men ($p = .015$). One in five participants in both sexes suffered from clinical anxiety and one in six participants in both sexes suffered from clinical depression. Women scored higher on both the anxiety (4.8 versus 4.2) and depression scale (6.8 versus 6.5). Those participants who manifested clinical anxiety were younger compared with those who did not (aged 56.8 versus 66.8 years). Finally, older patients (aged 68.5 years) manifested higher levels of depression.

Conclusions: The level of pain perceived by patients undergoing chronic hemodialysis therapy was generally low, especially in women. The study also demonstrated a positive association between levels of pain and anxiety and depression.

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Chronic renal insufficiency (CRI) is a serious incurable illness (Li et al., 2016). The most common therapy used worldwide is hemodialysis (HD) (Jha et al., 2013), which entails an absolute life dependency on a blood filtering machine. HD therapy is not free of complications. Therefore, the life of patients undergoing chronic HD therapy is subject to different stressful and threatening situations from the moment of diagnosis (Pabón-Varela et al., 2015). Pain is a real and present factor for patients who are on chronic HD therapy (Brkovic et al., 2016; Fleishman et al., 2018) and has been shown to have a negative effect on their quality of life as well as their physical, emotional, and social condition (Samoudi et al.,

2021; Jassal et al., 2016). In 2019, the incidence rate of HD treatment in Spain was 5,614 per million of the population and it has been increasing over the years.

Background

An estimated 2.6 million people received HD worldwide in 2010 (Liyana et al., 2015), and this high global prevalence has been confirmed in numerous studies (Hill et al., 2016). Moreover, approximately 60% of cases report some kind of pain (Lambourg et al., 2021). In a systematic review of the prevalence of pain in patients undergoing chronic HD therapy, up to 92% of studies reported chronic pain, and up to 82% reported acute pain. The main types of pain described are: general pain; pain related to arteriovenous access; headaches; and musculoskeletal, procedural,

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neuropathic, and ischemic pain (Brkovic et al., 2016). Furthermore, patients who suffer from pain have a higher age-comorbidity index than those who do not (Villate et al., 2014). Other studies have reported musculoskeletal pain as the most frequent form of chronic pain in 54% of the cases (Ghonemy et al., 2016).

Davison et al. (2014) showed that 17.5% of patients on HD therapy experienced mild pain, 27.3% moderate pain, and 55.3% severe pain. In another study (Fleishman et al., 2018), a prevalence of approximately 62% of the participants on HD therapy reported neuropathic pain. Symptom burden in end-stage renal disease should be considered, as it is substantial and may have a tremendously negative impact on patients. In this way, pain is an independent predictor of both the mental and physical composite of health-related quality of life (Sadigova et al., 2020).

The studies performed in relation to pain in patients with chronic HD show that pain management is such a complex concern that a multidisciplinary team should care for these patients in order to lessen not only the physical but also the psychological and social impact (Zyga et al., 2015). The treatment of pain in these patients is difficult to apply or is insufficiently administered (Dolati et al., 2020; Davison et al., 2014; Santoro et al., 2013). The clinical efficacy and effects of most analgesic medicine is altered by impaired renal function. There is limited information on the ability of dialysis to clear the medicines and/or their metabolites (US Food and Drug Administration). The degree to which analgesic medicine regimes require alteration with patients undergoing HD therapy depends on many different variables, such as residual kidney function, or whether the medicine has active metabolites that are dependent on kidney excretion, among others (Schug et al., 2016).

Effect of pain on anxiety and depression

Uncontrolled pain can have consequences beyond the immediate perception of pain and can negatively affect patients' well-being on multiple levels. It is known that the presence of pain has a negative impact on the quality of life of patients on chronic HD therapy and may play an important role in the comorbidity of mental health symptoms such as depression and anxiety (Fleishman et al., 2018; Theofilou et al., 2013; Weisbord, 2016).

The International Association for the Study of Pain (IASP) (Cohen et al., 2018) defines pain as "An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage" (Raja et al., 2020). The concept integrates biologic and psychologic aspects, and accordingly considers it a subjective experience. Patients can manifest a painful sensation even without tissue damage or any discernible pathophysiologic cause. Lack of control over pain often results in anxiety and worry, leading to a depressed mood and complicating the clinical situation even more. Thus, chronic pain that is accompanied by chronic anxiety can also lead to depressive states that will coexist with, or replace, anxiety. It is also known that depressive patients experience more painful stimulation and a decrease in quality of life (Cohen et al., 2016; El Filali et al., 2017).

From a biologic perspective, three broad categories of pain have been described: nociceptive pain, where the nerves are not damaged and pain results from stimulation of peripheral or visceral nociceptors, which subsequently send their signals via the spinal cord to the brain; neuropathic pain, generated from an alteration of the afferent somato-sensory pathways caused by damage of the peripheral (PNS) or central nervous system (CNS), and mixed pain, which is a combination of the two previously mentioned categories (Kowalski et al., 2014). Pain in HD patients is related to high levels of uremia which can develop with renal bone disease, osteoarthritis, calcific uremic arteriolopathy, and peripheral neuropathy. On the other hand, comorbidity of the underlying disease as well as

the disease responsible for the chronic kidney disease (CKD) has an impact on chronic pain (Davison et al., 2014). Unfortunately, only 25% of patients are effectively treated. If not treated, persistent pain may lead to various physical, psychological, or social consequences (Santoro et al., 2013). On the other hand, age and the duration of HD are factors known to enhance the onset of pain (Samoudi et al., 2021).

Studies show that there is a high prevalence of anxiety and depression levels in patients undergoing chronic HD therapy (Cohen et al., 2016; Feroze et al., 2012), specifically 32.7% of prevalence in clinically relevant anxiety symptoms (Gómez et al., 2015). In addition, anxiety has been associated with a lower quality of life and is higher in patients who are on chronic HD therapy at an older age. It has also been observed that anxiety is more prevalent in the first months of HD therapy (Gómez et al., 2015). While technology has managed to decrease the mortality of CKD patients and improve the replacement therapy of renal function, the presence of depression and anxiety in this type of patient increases their risk of morbidity (Perl et al., 2017).

The primary aim of the present study was to analyze the perception of pain in patients with chronic HD treatment in order to find associations with sociodemographic data as well as with anxiety and depression.

Methods

Aims

The aim of this study was to examine the perception of pain in patients undergoing chronic HD therapy and analyze the relationship between their pain, sociodemographic data, anxiety, and depression.

We hypothesized that both the association between pain and anxiety and the association between pain and depression would be positive, in such a way that patients suffering from high levels of anxiety and/or depression would also experience high levels of pain. Moreover, we hypothesized that sociodemographic factors such as a high level of education, high income and being professionally active would correlate negatively with levels of pain.

Design

The research was conducted using a quantitative, observational, cross-sectional, multicenter design (Watson, 2015).

Participants

All 297 patients included in the chronic HD program of a region of Catalonia (Spain) in 2014–2015 were eligible to take part in this study in a convenience sample made up of patients attending four HD centers that presented similar characteristics. Data were collected from these centers and the inclusion criteria were: patients aged >18 years; patients currently attending one of the four different HD units; and patients who voluntarily agreed to participate. The exclusion criteria were: patients who had been diagnosed with a mental health condition prior to data collection; and patients with language barriers. Figure 1 shows the number of participants included in the study. After applying the above criteria, a total of 138 patients were eligible to answer the self-assessment questionnaires (46.5%).

Data Collection

First, permission to contact the patients was requested from the clinic or hospital management as well as from the medical and

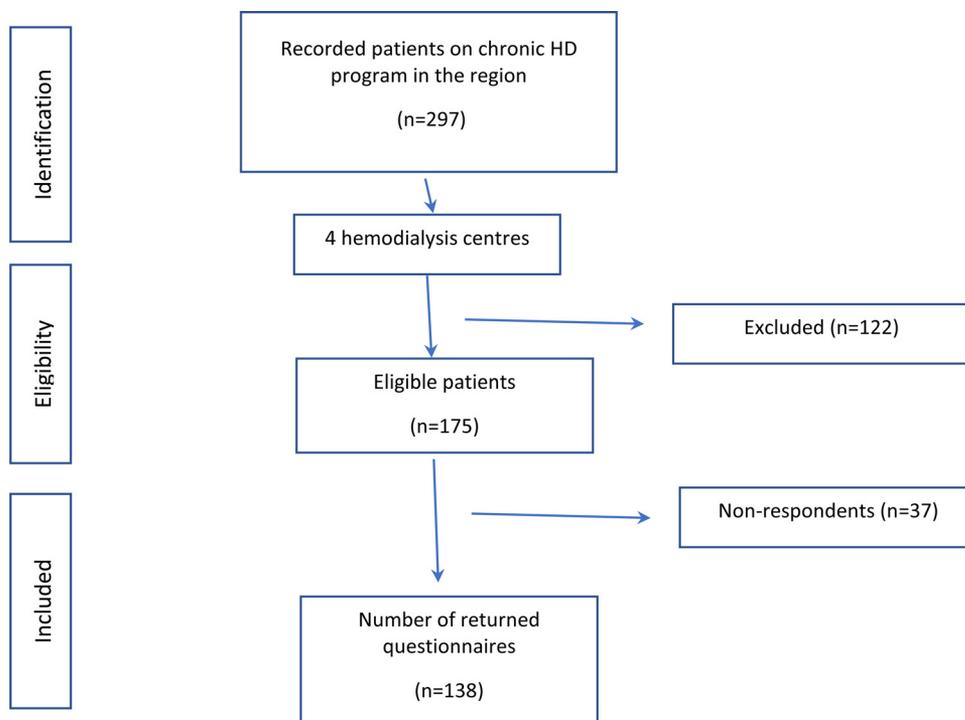


Figure 1. Flow chart of study.

nursing supervisors at the hemodialysis units. Not only the patients but also the team members working at the hemodialysis units were informed about the purpose of the study, data confidentiality, and voluntary participation. Data collection (2014–2015) was carried out when the patients were undergoing HD therapy and paper format questionnaires were handed out to be completed in situ. Some patients requested to answer them at home due to physical difficulties, such as needle insertions or not carrying reading glasses at the time of HD therapy, and these questionnaires were returned the day after undergoing therapy. The principal investigator stored and protected the data, in accordance with international current data protection and institution regulations.

Outcome Variables

The ad hoc participation questionnaire designed for sociodemographic data collection included the following variables: age and sex; level of education (primary, secondary, and university); living arrangements (alone, nursing home, living with family); employment status (employed, unemployed, retired, other); and monthly income (>€645, <€645 – based on the national minimum wage in Spain in 2016). Pain was defined as the study variable, in which the general significance of pain intensity was measured, and the patients' anxiety and depression levels were analyzed.

Instruments

In order to collect pain data, we used the visual analog scale (VAS), a unidimensional measure of pain intensity. It consists of a straight line with absence of pain represented at one endpoint (0) and extreme pain at the other (10). The patient should mark the degree of pain he or she is suffering on the straight line between the two endpoints. VAS is also used to assess pain effect (Haefeli & Elfering, 2006; Huskisson, 1974). To analyze the levels of anxiety and depression, we used the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) in its Spanish

version (1992) (Garbaldà & Ibáñez, 1992). The aim of HADS is to detect the severity of anxiety and depression symptoms and assess non-somatic aspects of these two conditions. It is an instrument with good psychometric properties in terms of factor structure, sub-scale intercorrelation, homogeneity and internal consistency. It contains 14 items with multiple answers ranging from 0 (never) to 3 (always). Anxiety and depression scores are provided independently and the core measurements are grouped in three levels: >10, between 8–10, and <8, indicating abnormal (clinical), borderline (doubtful), and normal (no presence) levels of anxiety or depression, respectively (Ryde-Brandt, 1990). Regarding the psychometric characteristics of the instrument, its high internal validity stands out with a coefficient $\alpha = 0.82$ for the anxiety subscale, $\alpha = 0.84$ for the depression subscale and $\alpha > 0.70$ for test-retest reliability. It also displays satisfactory sensitivity and specificity ($\alpha > 0.80$) (Tejero et al., 1986).

Ethical Considerations

This research study has complied with the fundamental ethical principles that govern research conduct. The anonymity of the participants was guaranteed at all times and the informed consent form was signed by them prior to the start of data collection. The study was approved by the Clinical Research Ethics Committees of Catalonia, Spain (accepted number: 2014.016; date: 24/02/2014 act #3).

Statistical Analysis

Statistical analysis was performed using Windows SPSS software, version 25.0 for IBM. Continuous variables were described as the mean (M) and standard deviation (SD) or the median and interquartile range (IQR), according to their probability distribution. Continuous variables were compared with the Student's *t* test or with a one-factor analysis of variance (ANOVA), and the categorical variables with the χ^2 test. To relate two continuous vari-

Table 1
Sociodemographic Characteristics by Gender.

	Total population N = 138	Menn = 89 (64.5%)	Womenn = 49 (35.5%)	p
Age	65.2 (15.5)	65.2 (15.1)	65.3 (16.4)	.964
Level of education				
Primary	106 (76.8)	67 (75.3)	39 (79.6)	.836
Secondary	25 (18.1)	17 (19.1)	8 (16.3)	
University	7 (5.1)	5 (5.6)	2 (4.1)	
Living arrangements				
Alone	18 (13)	8 (9)	10 (20.4)	.142
Nursing homes	2 (1.4)	1 (1.1)	1 (2)	
With family	118 (85.5)	80 (89.9)	38 (77.6)	
Employment status				
Employed	6 (4.3)	5 (5.6)	1 (2)	.009
Unemployed	6 (4.3)	3 (3.4)	3 (6.1)	
Retired	118 (85.5)	80 (89.9)	38 (77.6)	
Other situation	8 (5.8)	1 (1.1)	7 (14.3)	
Household income				
≥645€/month	83 (60.1)	60 (67.4)	23 (46.9)	.029
<645€/month	55 (39.9)	29 (32.6)	26 (53.1)	

Quantitative variables are presented with mean and standard deviation and categorical variables are presented with their absolute frequency and their percentage in parentheses.

ables, Spearman's correlation coefficient was used. A linear regression model was carried out to study the factors related to pain perception. The variables accepted for the linear regression analysis were the ones associated with pain in the bivariate analysis, firstly, sociodemographic followed by anxiety and depression. Pain was considered to be the dependent variable and age, sex, anxiety, and depression, the independent variables. In all cases, a $p < .05$ was considered statistically significant.

Results

We studied 138 people with a mean age of 65.2 years ($SD = 15.5$), with chronic renal failure, who were being treated with chronic HD therapy at the time of the study. Of the full sample, 64.5% were men ($n = 89$) between 25–91 years of age, the mean age being 65.2 years ($SD = 15.5$). Most of our population of study (85.5%) lived with family, and 85.5% were retired, with a higher proportion of men. In relation to household income, six out of 10 participants had an income equal to or greater than €645 per month, with a statistically significant percentage of men (Table 1).

With regard to the variables relating to HD therapy, we observed that the average number of days of HD therapy per week and HD hours per session were 3.04 days ($SD = 0.223$) and 3.91 hours ($SD = 0.297$), respectively. The general period of time on HD therapy was 55.20 months ($SD = 56.55$).

The mean scores on the pain scale based on sociodemographic characteristics are shown in Table 2. In relation to the participants' pain, the mean in the sample was 3.6 ($SD = 3.07$). When compared by sex, lower levels of pain were manifested in women than men ($p = .015$). Participants who were employed also had slightly higher scores than those who were retired, but without statistical significance. Participants presented similar pain scale scores based on their employment status.

The average score on the anxiety scale was 6.5 ($SD = 4.4$) and on the depression scale, 6.64 ($SD = 4.1$). Women scored higher on both the anxiety scale (4.8 versus 4.2) and depression scale (6.8 versus 6.5), with no statistical significance ($p > .05$). Of the participants, 19.6% and 16% were included in the diagnostic categories of anxiety and clinical depression, respectively. In addition, 11.6% were classified as having borderline anxiety and 21% as having borderline depression.

It is worth noting that the scores on the VAS showed a significant positive correlation between pain and levels of anxiety and depression in all cases. Scores were higher between pain and de-

Table 2
Visual Analog Scale (VAS) Pain Scores Based on Sociodemographic Characteristics.

	Mean (SD)	p
Level of education		.064
Primary	3.9 (3.1)	
Secondary	2.8 (2.6)	
University	1.7 (2.2)	
Living arrangements		.900
Alone	3.7 (3.1)	
Nursing homes	2.7 (2.4)	
With family	3.5 (3.08)	
Employment status		.933
Employed	4.4 (3.8)	
Unemployed	3.5 (3.5)	
Retired	3.5 (3)	
Other situation	3.6 (3)	
Household income		.077
≥645€/month	3.2 (2.9)	
<645€/month	4.1 (3.2)	

pression (Spearman's $\rho = 0.461$; $p < .01$); between pain and anxiety Spearman's $\rho = 0.379$; $p < .01$, and between anxiety with depression (Spearman's $\rho = 0.574$; $p < .01$).

When grouping participants according to whether they showed no anxiety ($n = 95$), doubtful anxiety ($n = 16$), or clinical anxiety ($n = 27$), we observed that those who manifested clinical anxiety were younger compared with those who did not. The difference was significant (aged 56.8 years versus 66.8 years; $F = 5.516$; $p = .005$).

When grouping participants with depression ($n = 87$), doubtful depression ($n = 29$), and clinical depression ($n = 22$), it was observed that those who manifested clinical depression were older than those who did not. The difference was not statistically significant (aged 68.5 years versus 63.9 years; $F = 0.907$; $p = .907$).

Figures 2 and 3 show the range of pain data and differences between the anxiety and depression groups. People with a no anxiety score had a median significantly lower to doubtful anxiety and clinical anxiety ($p < .001$). People with a no depression score had a much lower median than those with doubtful and clinical depression ($p < .001$).

Table 3 shows results of the linear regression model used to study the factors associated with pain perception. Age ($p = .030$), anxiety ($p = .003$), and depression ($p = .008$) were shown to be directly and significantly associated with perceived pain according to the VAS scale.

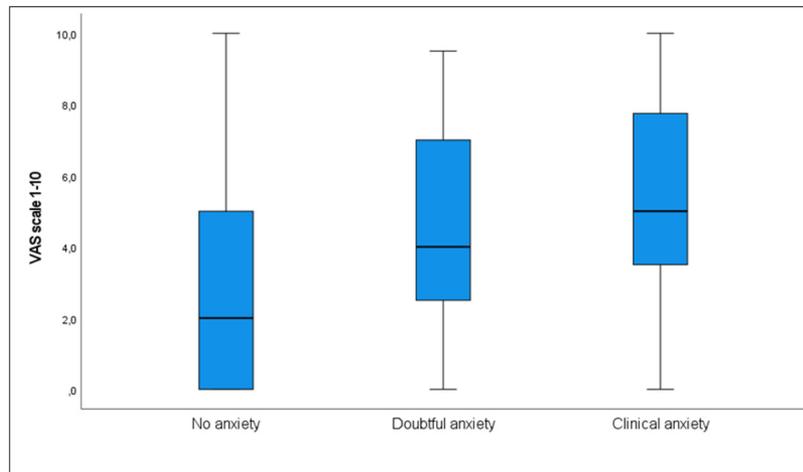


Figure 2. Boxplot of pain according to the three groups of anxiety.

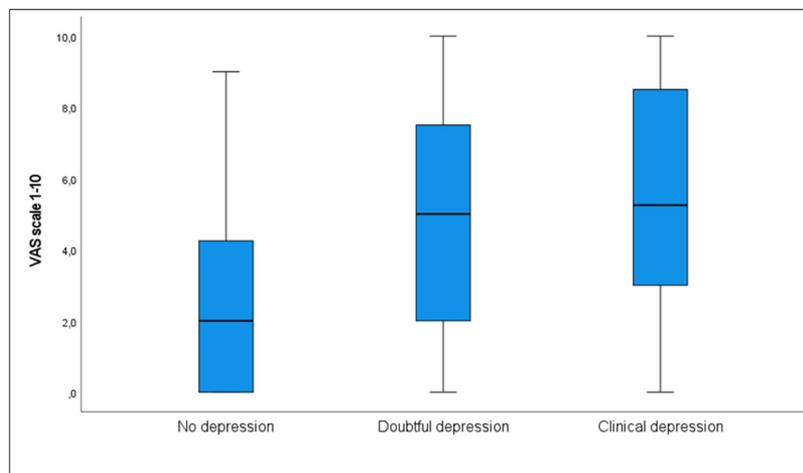


Figure 3. Boxplot of pain according to the three groups of depression.

Table 3
Linear Regression Model Studying the Associated Factors of Perceived Pain.

	Unstandardized coefficient		Standardized coefficient	t	Sig.	95.0% Confidence interval for B	
	B	Standard error	Beta			Lower limit	Upper limit
(Constant)	-2.537	1.240		-2.046	0.043	-4.990	-0.085
Age	0.035	0.016	0.175	2.191	0.030	0.003	0.066
Gender	0.990	0.472	0.155	2.099	0.038	0.057	1.923
Anxiety	0.199	0.066	0.290	3.042	0.003	0.070	0.329
Depression	0.188	0.070	0.253	2.694	0.008	0.050	0.326

R^2 (coefficient of determination) = 0.295. Sig. = significance.

Discussion

This study examined the pain experienced by people undergoing chronic hemodialysis therapy and related it to their levels of anxiety and depression. In general, the level of pain of participants was low and when comparing by sex, women manifested lower levels of pain than men. With regard to anxiety and depression, we point out that 20% of participants presented anxiety and 16% presented depression. A significant positive relation between pain and levels of anxiety and depression was present.

The mean age of the participants was 65.2 (SD = 15.5), lower than the mean age of HD patients in Spain and Europe, 78% of whom were aged >75 years (XLV Congreso Nacional de la Sociedad Española de Nefrología, 2015). However, in other studies, younger

ages have been observed. For example, in a sample of American patients, participants undergoing hemodialysis therapy had a mean age of 52 years (Li et al., 2016).

Two-thirds of the participants in our study were men, a distribution similar to American patient samples (Li et al., 2016). In contrast, similar percentages of men and women have been reported in European samples (Informe de Diálisis y, 2017). Nearly a quarter of the population of the present study had a secondary or tertiary level of education, results that did not coincide with the data on kidney disease in our region, where a higher percentage of people with this level of education was reported.

Regarding living arrangements, more than 80% of participants confirmed they were living with family, similar to the results of the latest data recorded in the same region (Martínez et al., 2015).

Stomer et al. (2019) observed a slightly higher proportion of patients with CKD living alone (26%) compared with the present sample.

The variables related to HD therapy in the present study are very similar to the therapies performed nationally and internationally (Ashby et al., 2019).

No patient manifested high levels of pain in the present study. The mean in the sample was <4, and when compared by sex, women manifested lower levels of pain than men. Contrary to other studies (Fleishman et al., 2018), results demonstrated that women were more likely to report pain and in a higher intensity than men, and this had a negative impact on the lives of these female patients on HD therapy (Fleishman et al., 2018; Marzouq et al., 2021). Fifty-seven percent of the patients in the study by Kuzstal et al. (2018) reported “moderate” pain with a mean VAS score of 5.01 ± 1.3 . However, a systematic review in 2016 concluded that a high prevalence of pain existed in HD patients (Brkovic et al., 2016).

Twenty percent of participants presented with anxiety and 16% presented with depression. It was also observed that 11.6% of participants presented with doubtful anxiety and 21% with doubtful depression. The average score on the anxiety scale was 6.5, and 6.64 on the depression scale which shows normal levels of both variables. Other research studying anxiety using the HADS instrument (Zhang et al., 2014; Li et al., 2016) showed increased frequency and severity of anxiety and depression in HD patients. Furthermore, in a population of Japanese HD patients, results showed a HADS-Anxiety score of 4.6 ± 3.6 and a HADS-Depression score of 6.0 ± 4.0 (Shimizu et al., 2018). Of the patients on HD in Lebanon, 30% and 11% had doubtful and clinical depression, respectively. Of the patients in the study by Kuzstal et al. (2018), 30.2% scored >8 in HADS and showed depressive/anxiety symptoms. On the other hand, the same study showed 25% and 14% of doubtful and clinical anxiety levels, respectively (Semaan et al., 2018), even though cut-off points of >6 for anxiety and >7 for depression were used (Preljevic et al., 2012). Studies using other instruments, such as Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI), in a prospective cohort study showed that 22% and 42% of patients from Netherlands suffered from anxiety and depression, respectively (Schouten et al., 2019), a significantly higher outcome than in the present study.

When studying the relationship between pain and levels of anxiety and depression, the scores on the VAS scale showed a significant positive relation in all cases, the highest of which were between pain and depression, pain and anxiety, and anxiety and depression. Our results are consistent with those observed by Kuzstal et al. (2018), who also detected that high levels of anxiety and depression measured with HADS corresponded to people who suffered intense pain. Depression serves to increase prevalence and intensity of pain, as measured in several other studies (Weisbord, 2016; Fleishman et al., 2018; Kuzstal et al., 2018). Our hypothesis is based on exploring the factors related to pain in patients undergoing chronic HD therapy, as often there is no other clear explanation for this patient pain. In light of this, examining the mental health status of these patients with a specific instrument would be fundamental.

The connection of pain with anxiety and depression has also been studied in other types of patients suffering from chronic pain and chronic disease, and the results are similar to our own (Bordoni et al., 2017; Tsatali, et al., 2014). Anxious patients who experience chronic pain feel it more intensely than those who do not. There is also a high prevalence of anxiety or depressive symptoms among patients with anxiety.

Fleishman et al. (2018) also used a multivariate logistic regression to identify factors associated with pain. These factors included

female sex and the presence of major depression, among others. In the present study we observed that age, anxiety, and depression have a direct and significant association with pain, and that women presented a lower perception of pain than men.

Limitations

There are several limitations which are important to consider for the present study. Firstly, this is a cross-sectional study; therefore, we cannot establish either causality or direction of the associations studied. Secondly, self-reporting measures are prone to recall bias. Since most questionnaires were completed during therapy, the presence of medical staff and other patients may have influenced the objectivity of the responses and threaten the validity of the data. Finally, pain has been measured only with the VAS instrument and no other instruments were used. Consequently, we were not able to consider other types of pain assessment tools. On the other hand, this study reinforces the existing evidence of the impact of HD therapy on patients' wellbeing and quality of life and calls for the development and implementation of effective measures in nursing practice.

Conclusions

Low levels of pain have been observed in patients undergoing chronic HD therapy, especially in women. However, a significant association has been observed between pain and both anxiety and depression. One in five participants in both sexes met the diagnostic criteria for clinical anxiety and one in six participants in both sexes suffered from clinical depression. The findings of this study reassert the status of pain, and factors that influence pain, as a considerable health concern and illustrate the importance of applying pain management nursing practices for patients undergoing chronic HD therapy to improve their quality of life and quality of care.

Implications for Nursing Practice

This study reinforces the existing evidence of detrimental mental health effects suffered by patients with CKD receiving chronic HD therapy. These detrimental health effects have a proven impact on patients' wellbeing and quality of life and effective measures need to be developed and implemented in nursing practice.

Integrating Patient-Reported Outcome Measures (PROM) assessments into the patient-centered care of persons receiving HD could provide consistency, reassurance, and enhance the care of those patients with the greatest symptom burden (Peipert & Hays, 2017).

Hemodialysis nurses should adopt a holistic view of patients with CKD in order to consider and care for many aspects of their suffering, including the management of pain. Pain management in patients with CKD is complex and requires a set of skills including recognition of types of pain, syndromes, and appropriate history-taking skills (Koncicki et al., 2017).

It has been demonstrated that emotional aspects have a high impact on morbidity and mortality (Malheiro Oliveira & Arruda Soares, 2012), and accordingly should be considered and studied within a multidisciplinary team as a treatable aspect of the patient's health, together with other physiologic aspects. To this end, constant advanced care planning in nursing is considered fundamental to improve quality of life and respond to the changes experienced individually by HD patients. This would include an emotional evaluation of the patient both in the first instance, and continuously throughout HD therapy, in order to provide the highest level of care pursuant to the information contained in the Amer-

ican Nephrology Nurses Association (ANNA) Nephrology Nursing Scope and Standards of Practice (Gómez et al., 2015).

Nursing interventions can help patients manage pain, anxiety, and depression. Within these nursing interventions, techniques such as active listening can be utilized to support patients and sustain a respectful environment. Nurses have the capacity to execute a helpful relationship and have at their disposal key resources for resolution (Coelho et al., 2020). Complementary therapies also have the potential to reduce pain among individuals and nurses can form part of patient pain management through accurate interventions (Zins et al., 2018).

The results of this study may serve as a starting point to manage pain from a different perspective, with a considered focus on addressing anxiety and depression as an effective strategy to reduce pain (*Dialysis Outcomes and Practice Patterns Study*, n.d.).

Declaration of Competing Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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