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Emotional profile of haemodialysis patients: a multicentre study

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ABSTRACT

Introduction: Chronic kidney disease causes major physical, psychological and social changes. Its impact on quality of life, together with emotional disorders, favours symptom development at higher rates than in the general population.

Objectives: To determine the emotional profile of haemodialysis patients.

Material and Method: We conducted a multicentre cross-sectional descriptive study involving haemodialysis patients from Fundación Renal centres in the Community of Madrid (Spain). Emotional profile was assessed using the Mood State Assessment Scale (EVEA).

Results: Among 245 patients, positive emotions were rated higher than negative ones, with a predominantly "cheerful" emotional profile.

Conclusions: Patients on haemodialysis show a high positive emotional profile, with predominance of joy, optimism and joviality. Negative emotional profiles such as anxiety, irritability or sadness were observed at low levels.

Keywords: haemodialysis; emotions; chronic kidney disease.

RESUMEN

Perfil emocional del paciente en hemodiálisis. Estudio multicéntrico

Introducción: La enfermedad renal crónica ocasiona grandes problemas y cambios a nivel físico, psicológico y social en las personas que la padecen. El gran impacto sobre la calidad de vida, unido a la presencia de trastornos emocionales, favorecen la aparición de síntomas en estos pacientes en mayor proporción que en la población general.

Objetivos: Determinar el perfil emocional de los pacientes en hemodiálisis.

Material y Método: Estudio descriptivo transversal multicéntrico llevado a cabo con pacientes con enfermedad renal crónica en tratamiento de hemodiálisis pertenecientes a centros de la Fundación Renal de la Comunidad de Madrid. Se empleó la Escala de Valoración del Estado de Ánimo (EVEA) para la valoración del "perfil emocional". Se realizó un análisis descriptivo de la muestra.

Resultados: Entre los 245 pacientes muestreados, se observó una mayor valoración de las emociones positivas frente a las negativas, siendo el perfil emocional "alegre" el predominante.

Conclusiones: Los pacientes en hemodiálisis presentan un alto perfil emocional positivo, predominando sensaciones de alegría, optimismo y jovialidad. Los perfiles emocionales negativos, como ansiedad, irritabilidad o tristeza, se observan

en niveles bajos. En conjunto, la terapia renal sustitutiva con hemodiálisis se asocia con un predominio de emociones positivas frente a las negativas.

Palabras Clave: hemodiálisis; emociones; enfermedad renal crónica.

INTRODUCTION

The chronic pro-inflammatory state experienced by patients with kidney disease produces alterations at multiple levels, with consequences including the malnutrition–inflammation syndrome, vascular calcification, and endocrine system disorders, among others[1,2]. However, this state not only affects physical health; numerous studies have demonstrated a close relationship between pro-inflammatory status and reduced quality of life, the presence of depression and anxiety, and increased morbidity and mortality in affected patients.[1,3-5].

Multiple investigations have shown an association between elevated levels of pro-inflammatory substances—such as C-reactive protein, cytokines, interleukins and tumour necrosis factor—and the development of depression, anxiety and other personality traits including neuroticism, hysteria, hostility and hypochondriasis, as well as with the development of conditions such as Alzheimer's disease, Parkinson's disease, schizophrenia and bipolar disorder[4-6].

Excessive and sustained overproduction of inflammatory cytokines in the brain alters multiple neuronal functions, impairing the synthesis, reuptake and release of neurotransmitters[6].

This results in behavioural changes affecting both mood and cognition, together with the development of clinical manifestations such as anorexia, reduced mobility and physical activity, and sleep disturbances—symptoms that are recognised as characteristic of depression[6].

Several studies have linked the presence of a pro-inflammatory state in patients with chronic kidney disease (CKD) to the development of emotional disorders such as depression, while its absence or effective control favours positive emotional states[1,7,8].

Depression and anxiety have been identified as the most prevalent emotional disorders among patients with CKD and are closely related to both the diagnosis of the disease and the physical and socio-familial changes it entails[9]. According to various studies, approximately 20–60% of haemodialysis (HD) patients suffer from at least one of these emotional disorders[9-12]. The presence of depression and anxiety significantly reduces quality of life and markedly increases mortality among affected patients[9,10,13,14]. These disorders are more common in women of low socioeconomic status, unemployed individuals, those who are unmarried or without a partner, and those lacking adequate family or social support[10-12].

From a clinical perspective, the presence of comorbidities, metabolic and endocrine changes, chronic pain, inflammatory and uraemic states, hypoalbuminaemia, dietary and fluid restrictions, reduced sexual function and limited physical activity are among the factors that contribute to the development or progression of depressive and anxious states in CKD patients[10-12,14].

Individuals with chronic diseases are inherently more vulnerable to mood disorders simply as a consequence of living with illness. The disease disrupts daily life, directly affecting personal, social and work relationships, independence, activities of daily living, mobility and travel, thereby exerting a negative impact on emotional well-being[14,15].

The prevalence of depressive disorder among CKD patients undergoing HD ranges from 25.8% to 68.1%, while anxiety disorders affect 21–35.3% of patients on HD-based renal replacement therapy. These emotional states are inversely associated with health-related quality of life (HRQoL)[16,17].

Depressive and anxious disorders arising in the context of chronic illness occur predominantly in women with a characteristic profile: low educational level, absence of a partner, and living alone[12,18]. Poor health status, a high number of comorbidities, limited social relationships, restricted daily activities, and symptoms such as pain further contribute to the development of depressive and anxious symptomatology[11,19,20].

The literature review conducted by Bautovich et al.[14] highlights the growing body of evidence demonstrating that anxiety and depressive disorders increase mortality and hospitalisation rates, reduce treatment adherence and HRQoL, and influence the appearance and expression of somatic symptoms. Negative emotions such as anxiety and depression can exacerbate disease progression, interfere with treatment, and increase symptom burden, thereby significantly increasing morbidity and mortality and acting as independent predictors of survival[6,7,21,22]. These negative emotional states also intensify the perception of physical symptoms and somatic complaints.

A study conducted at the Nephrology Clinical Management Unit of *Hospital Universitario Reina Sofía* (Córdoba, Spain)[23] reported that 66.7% of chronic HD patients exhibited some form of emotional disturbance, including depression, sadness, nervousness, anxiety or distress, consistent with findings from other national and international studies[10,12,24].

Any chronic disease with life-threatening potential inevitably generates anxiety and depression. In CKD, this is compounded by feelings of helplessness, limitation and dependence on dialysis machinery, profoundly affecting emotional health. Emotional disturbances are further intensified by the numerous losses patients face throughout the disease course:

loss of health, well-being, employment, social relationships and sexual function.

In light of these considerations, the present study aimed to define the emotional profile of patients receiving chronic haemodialysis as renal replacement therapy.

MATERIAL AND METHOD

Study Design and Setting

We conducted a multicentre, cross-sectional, descriptive observational study in patients with CKD undergoing haemodialysis at centres of the Spanish Renal Foundation in the Community of Madrid.

Population and Sample

The study population comprised CKD patients receiving HD treatment at the eight Spanish Renal Foundation centres in the Community of Madrid.

Inclusion criteria:

- Age ≥18 years
- Written informed consent
- Diagnosis of advanced CKD (stages 4–5)
- At least 3 consecutive months on dialysis

Exclusion criteria:

- Current diagnosed psychiatric disorder
- Cognitive impairment and/or language barriers preventing questionnaire completion

Sample Size

Convenience sampling was carried out, taking into consideration the total number of patients receiving healthcare at the eight Spanish Renal Foundation centres in the Community of Madrid (n = 815). The final sample consisted of 245 patientsfrom 7 different centres of the Spanish Renal Foundation.

Variables

- Sociodemographic variables: age, sex and treatment centre. These variables were obtained from the electronic medical record system (*Nefrosoft*®).
- Clinical variables: cause of disease, time on treatment, type of vascular access, dialysis dose (Kt), interdialytic weight gain and Charlson Comorbidity Index (CCI). These variables were obtained from the electronic medical record system (Nefrosoft®).
- Primary emotional profile variable: discrete ordinal quantitative variable with scores ranging from 0 to 40 points.

Four emotional profiles were defined: joyful, anxious, irritable–hostile, and sad–depressive.

Measurement Instrument

The primary emotional profile variable was measured using the Mood State Assessment Scale (EVEA). This Likert-type scale provides a score between 0 and 10 for each item. According to the scale guidelines[25], item scores are grouped into four subscales that define the emotional profiles used for interpretation of results. Each emotional profile yields a total score ranging from 0 to 40 points. Higher scores on the EVEA subscales indicate higher levels of sadness–depression, anxiety, anger–hostility or joy, respectively[26].

Data Collection

Data were obtained from each patient's medical record and from the assessment instrument administered by nursing staff at participating hospitals. Prior to inclusion, patients received an information sheet explaining the purpose of the study. Those who agreed to participate provided written informed consent before data collection.

Statistical Analysis

Collected data were stored in an anonymised database created using Microsoft Excel (Office 365) and subsequently cleaned and analysed using IBM SPSS version 25 and RStudio version 1.1.463.

A descriptive analysis was performed: categorical variables were summarised as frequencies and percentages, while quantitative variables were expressed as minimum, maximum, mean ($\bar{x}$), standard deviation (SD) and quartiles.

A significance level of 5% ($p<0.05$) was used in all statistical analyses.

Ethical Considerations

The study was reviewed and approved by the Clinical Research Ethics Committee of *Hospital Clínico San Carlos* (Madrid, Spain). Authorisation for data use, processing and dissemination was also obtained from the Spanish Renal Foundation. The handling of personal data complied with Spanish Organic Law 3/2018 of 5 December on the Protection of Personal Data and Guarantee of Digital Rights. In accordance with this legislation, participants were informed of their rights of access, rectification, objection and erasure of data (ARCO rights).

RESULTS

The final study sample comprised 245 patients from 7 different centres of the Spanish Renal Foundation in the Community of Madrid.

Descriptive analysis of the sociodemographic data showed that the sample consisted predominantly of men (65.7%; n=161), with women representing 34.3% (n=84). The mean age was 63.52 years (SD, 14.99), with a minimum age of 25 years and a maximum age of 90 years. Patients had been on haemodialysis for a mean duration of 81.44 months (SD, 96.62), ranging from 4 to 527 months.

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With respect to clinical variables, the mean final Kt was 52.15 L (SD, 9.09), and the mean interdialytic weight gain was 1.98 kg (SD, 0.71).

Regarding the aetiology of renal disease, 25.3% (n=62) of cases were of unknown origin, followed by type 2 diabetes mellitus in 19.6% (n=48), glomerulonephritis in 11.4% (n=28), other renal disorders in 11.8% (n=29), and hypertensive vascular nephropathy in 9.0% (n=22).

Concerning vascular access, a clear majority of patients had an arteriovenous fistula (71.8%; n=176), compared with those using central venous catheters.

The mean Charlson Comorbidity Index score was 7.68 (SD, 3.36), with minimum and maximum values of 2 and 21, respectively.

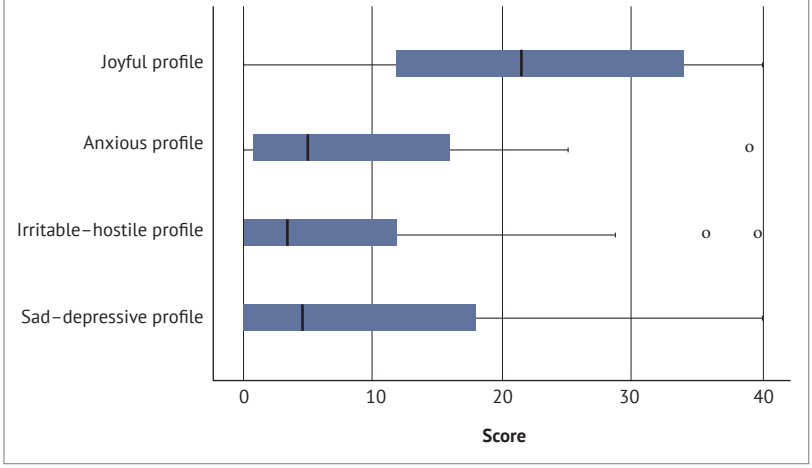

Figure 1. Emotional profile distribution.

Analysis of the emotional profile questionnaire revealed that the sample predominantly exhibited a joyful emotional profile, with scores exceeding 20 points in at least 50% of the sample and >30 points in at least 25% of patients. In contrast, negative emotional profiles (sad–depressive, irritable–hostile and anxious) showed scores <6 points in 50% of the sample **(figure 1)**.

High scores were observed for positive emotions (joyful, happy, optimistic and jovial), with at least 50% of patients scoring ≥5 points and at least 25% scoring ≥ 8 points in all four domains **(figure 2)**.

Conversely, negative emotions (angry, irritated, annoyed and anxious) showed the lowest scores, with 75% of patients scoring ≤ 3 points. The remaining negative emotions scored ≤ 5 points in 75% of patients **(figure 2)**.

DISCUSSION

The literature reports a high prevalence of negative emotional disorders such as depression and anxiety among patients with CKD on HD. Most studies indicate that 20–70% of patients experience some form of emotional disturbance, significantly affecting their quality of life[9,11,16,20,23]. However, the descriptive analysis of the emotional profile in the present study reveals a clear predominance of positive emotions (joyful, happy, optimistic and jovial) over negative emotions. The joyful profile achieved the highest scores on the EVEA scale, exceeding 20 points in at least 50% of the sample and 30 points in at least 25% of patients. In contrast, negative emotional profiles (sad–depressive, irritable–hostile and anxious) scored below 6 points in 50% of the sample.

Of note, the instrument used to assess emotional status in this study is not a diagnostic tool but a subjective self-report scale, in which patients rate from 0 to 10 the emotions experienced during the previous week. Therefore, results may be biased and influenced by the context in which the questionnaire is completed; thus, prevalence estimates of emotional disorders may vary according to the assessment tool employed[7-20]. Although the EVEA scale is not specifically designed for CKD populations, its psychometric quality and ease of administration make it a suitable instrument for mood assessment in diverse populations[25,26]. Its distinctive value lies in its ability to assess both positive and negative emotions within the same questionnaire, unlike many commonly used healthcare scales that focus on single indicators[26].

Another factor that may have influenced the findings is that patients may confuse emotional symptoms with manifestations of kidney disease itself or may conceal them due to fear of social stigma or rejection, which can lead to an underestimation of emotional disturbances in CKD[7]. Many somatic manifestations of depressive disorders—such as insomnia, loss of appetite and lack of energy—may be mistaken for symptoms of renal disease or for the social and personal changes caused by the illness, including loss of relationships, autonomy and social roles[14].

Furthermore, several studies suggest that individuals with optimistic personality traits cope better with stress and adapt more effectively to illness, which results in reduced symptom perception and even lower mortality[17,27-29]. Positive emotions are associated with lower pain scores[28], whereas negative emotions are linked to higher symptom intensity[20]. Individuals with negative emotional profiles are more prone to health problems and experience them more intensely than those with positive profiles, who display stronger coping abilities and emotional regulation[30].

Patients on HD represent a population with advanced age, multiple comorbidities, complex social circumstances and reduced HRQoL. Nevertheless, as shown in the work of

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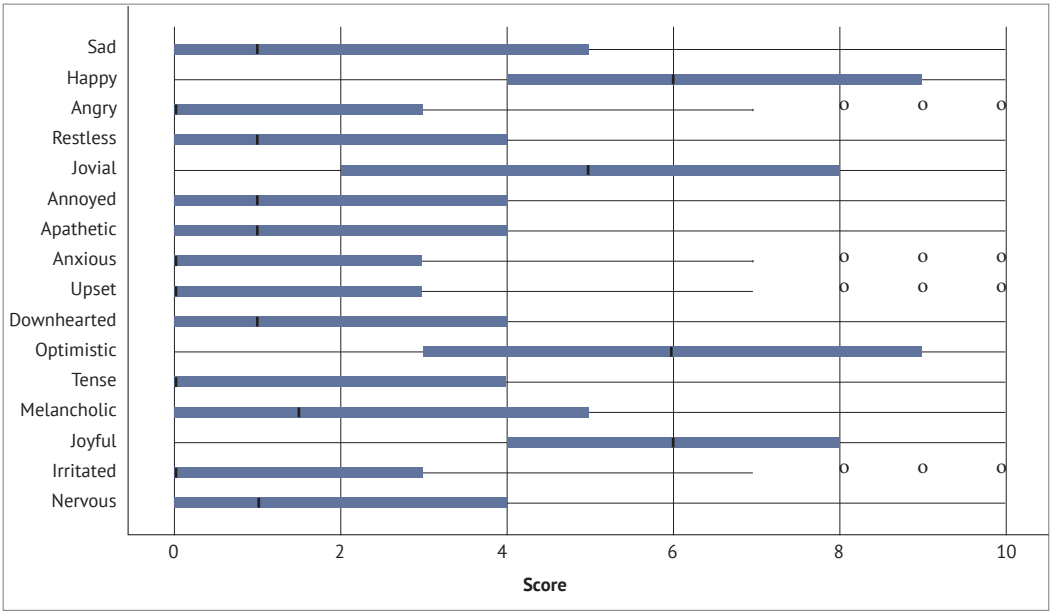

Figure 2. Distribution of emotions.

Laura L. Carstensen, older individuals develop psychological "defence mechanisms" that allow them to enjoy daily life more fully, exhibit greater empathy and gratitude, and experience more positive and fewer negative emotions than younger individuals.[31] Numerous studies have demonstrated an inverse relationship between age and negative emotions such as anxiety and depression, with positive affect and emotional well-being being more prevalent in older populations[18,31-33]. This may partly explain the high levels of positive emotions and low levels of negative emotions observed in our sample.

Happiness and other positive emotions play a crucial role in strengthening resilience, which in turn reduces negative emotions that contribute to depression[34]. Resilience is defined as an "active process resulting in positive behavioural adaptation that enables individuals to confront and overcome adverse situations with favourable outcomes"[35]. Higher resilience is inversely associated with stress and leads to improved HRQoL[36].

The concept of post-traumatic growth, described by Calhoun and Tedeschi, refers to the positive psychological changes that occur following the struggle with highly challenging life circumstances[37]. These changes promote personal, social and spiritual growth, allowing individuals to perceive life differently and derive greater enjoyment from it and from interpersonal relationships[38]. Evidence suggests that post-traumatic growth, hope and resilience are strongly associated with the predominance of positive emotions and the reduction of stress-related emotional states[39-42].

Although the results are encouraging and provide new insights into the emotional profile of haemodialysis patients, these issues must be approached from a multidimensional perspective. Clinical and psychosocial variables such as post-traumatic growth, resilience and hope should be examined in future studies using specific designs and validated instruments. This approach will enable a more comprehensive understanding of the impact of CKD on patients' quality of life and support the development of more effective, patient-centred interventions.

Limitations

Convenience sampling may have introduced selection bias, as participants may have been those with better physical and psychological health and greater motivation to participate. This could have produced selection bias, membership bias and even a Hawthorne effect, potentially inflating positive emotional profiles and reducing negative ones. Furthermore, the subjective nature of the EVEA scale represents another limitation, as it may have introduced measurement bias.

In addition, the existence of multiple emotional assessment tools with different constructs and scoring systems complicates direct comparison of results across studies.

Based on these findings, patients receiving haemodialysis as renal replacement therapy exhibit a predominantly joyful emotional profile, with high levels of joy, happiness, optimism and joviality, and low levels of negative emotions (anxiety, irritability, anger and sadness–depression).

Authors' contributions

Conceptualisation, study design, data collection, analysis and manuscript drafting: CHA. Study design, critical revision and final approval: MVP. Data collection, critical revision and final approval: HGD. Critical revision and final approval: HCMC.

All authors contributed substantially and approved the final manuscript.

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Conflicts of interest

None declared.

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