Research Article

Functional impairment associated with increased severity of mental health disorders in Latin American chronic hemodialysis patients

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Abstract

Background: End-Stage Kidney Disease (ESKD) and associated complications are related with increased prevalence of psychological disorders. There is a growing trend of elderly and high comorbid individuals beginning chronic Hemodialysis Programs (HD) while there is limited knowledge about the influence of functional impairment and comorbidity burden in the prevalence of mental health disorders and life satisfaction on HD population. The purposes of this study were to report the local prevalence of psychological disorders, life satisfaction and self-reported health status as well to describe differences in functional status and comorbidity burden scores between patients with moderate/severe psychological disorders and those none/mild alterations of a Latin American chronic HD cohort.

Methods: Transversal uni-center study in 139 Ecuadorian chronic and stable HD patients. Once patients were eligible to participate six tests were applied to explore functional status (Barthel Index and PPS score), depression, anxiety and stress prevalence (DASS-21 scale) comorbidity burden (Charlson Index), self-rated health state (EQ-5D/VAS) and satisfaction with life (SWLS score) Exclusion criteria were: Time in HD less than 6 months, recent hospitalization (less than 3 months) and severe cognitive impairment. Continuous symmetric variables were described as mean ± standard deviation or median and interquartile range if asymmetric. T-test was used for symmetric continuous variables, U-Mann-Whitney if asymmetric and chi-square for qualitative variables.

Results: A total of 79 (55%) patients were male. Mean time in HD was 73 ± 47 months, with mean age 56 ± 15.7 years. Prevalence of moderate/severe mental health disorders were: depression (28%), anxiety (37%) and stress (34%). Moderate/severe depressed patients scored significantly lower in Barthel Index (p=0.048) and those with moderate/severe stress scored significantly lower in Barthel Index (p=0.025) and PPS score (p=0.030). Time in HD > 92 months was significatively related with moderate severe/anxiety (0.044). Unsatification with life was found in 20% of patients and it was significatively related with lower functional Barthel Index (p=0.017) and PPS score (p=0.041) when compared with those satisfied with life. Patients with self-rated health status <70% on EQ-5D VAS scored significatively lower in Barthel Index (p=0.022) and PPS score (0.003) vs those with ≥70% score. No differences were found with age, CKD etiology, civil and laboral status.

Conclusions: Prevalence of mental health disorders is similar to other series reported. Patients with moderate/severe depression, stress, unsatisfaction with life, and low self-reported health state had worst functional status than those with none/mild alterations. Time in HD over 7.6 years was associated with higher intensity of anxiety.
Introduction

Chronic Kidney Disease (CKD) is a growing health care problem with a worldwide estimated prevalence of 29% in adult population and with more than 2 million people diagnosed with End Stage Kidney Disease (ESKD) who are on kidney transplant program and/or in dialysis treatments [1]. ESKD evolution, it’s associated complications (pruritus, anemia, appetite lost, physical impairment, etc), symptomatic burden, medications with adverse effects as well as dietary and fluid restrictions may produce sudden and unpleasant changes in patient’s lifestyle once they initiate in-center Hemodialysis (HD). These sudden changes accompanied with dependance feelings (to health-workers and/or to HD machines) and uncertainty about the future have been associated with increased prevalence of emotional and psychological disorders in this population [2,3].

According to several studies, ESKD patients have an increased prevalence of mental health disorders when compared with non–ESKD individual. For example, anxiety is 10% more prevalent in ESKD when compared with non–ESKD patients. Series have reported depression, anxiety and stress prevalences of 23%, 37% and 22%, respectively [3,4]. An increased prevalence of mental health disorders and decreased quality of life may worsen the natural course and evolution of ESKD patients by enhancing symptomatic perception, altering therapeutic adherence, and reducing satisfaction with life [4].

Nowadays there is an increase prevalence of elderly individuals with high comorbidity burden beginning dialysis programs with little known about the impact of functional impairment and high comorbid burden in the prevalence of mental health disorders, unsatisfaction with life and self-reported health status on ESKD population. Also, there is a lack of Latin American data reporting the prevalence of these alterations in the region.

The purposes of this study were to report the local prevalence of psychological disorders, life satisfaction and self–reported health status as well to describe differences in functional status and comorbidity burden scores between patients with moderate/severe psychological disorders and those none/mild alterations of a Latin American chronic HD cohort.

Methods

Observational transversal uni-center study in 139 Ecuadorian chronic hemodialysis patients who received HD treatment at “Clínica de los Riñones Menydiál” in Quito–Ecuador. Inclusion criteria were time on HD treatment in the studied center for ≥6 months, no recent hospitalization (less than 3 months), age ≥18 years. Exclusion criteria were severe cognitive impairment, episode of recent hospitalization, age <18 years old and time of dialysis treatment in study center less than 6 months. Once patients fulfilled inclusion criteria and accepted to participate in the study six psychological evaluations tests were applied in each studied patient. The different tests were applied by a psychologist professional before dialysis session in a quiet room with no time limit. Patients with visual or auditive impairment were accompanied by the formal caregiver which helped the patients in case of difficulties for answering the tests due to visual/hearing impairment or if patients couldn’t read or had difficulties to understand the questions. The duration of test response was from 40–50 min approximately. Instruments applied for screening of mental health disorders, functional status, comorbidity burden, satisfaction with life, and self-rated health state in studied population were the following:

Mental health disorders screening

Depression, anxiety and stress scale score–21 (DASS–21) [5]: Shortest version of “Depression, Anxiety and Stress Scale score” (DASS). It is a short and easy–to–answer self–report instrument composed by 21 questions that evaluate depression, anxiety and stress intensity [6]. Depression is evaluated by presence/absence of dysphoria, self–deprecation, lack of interest and anhedonia. Anxiety is explored by the presence of subjective symptoms of somatic fear, autonomic activation, episodes of situational anxiety and by the presence/absence subjective perceptions of anxious states. Stress is evaluated by the presence of hyperactivity states, irritability, difficulty to relax and notable impatience [6]. Each scale has seven items which are scrambled along the 21 questions of the test. The number of the questions that evaluate depression are: 3, 5, 10, 13, 16, 17 and 21. Those questions that evaluate anxiety are 2, 4, 7, 9, 15, 19 and 20, and those for stress evaluation are 1, 6, 8, 11, 12, 14 and 18. Each item has an established punctuation according to patient’s answer and all items are summed at the end of the test giving a final score which describes the intensity of psychological alteration [6,7]. Depression severity is classified according to the obtained score as: Mild 5–6 points, moderate 7–10 points, severe 11–13 points, and extremely severe ≥14 points. Anxiety intensity is classified with the following score: Mild 4 points, moderate 5–7 points, severe 8–9 points and extremely severe ≥10 points. Finally, stress intensity is classified with the following score: Mild 8–9 points, moderate 10–12 points, severe 13–16 points and extremely severe ≥17 points. The instrument has a reliability of 88% in depression; 79% in anxiety and 83% in stress screening with a full test reliability of 93% [6,7].

Satisfaction with life screening

Satisfaction with life scale (SWLS) [8]: It is one of the most used instruments to measure patient’s life satisfaction by evaluating subjective well–being and satisfaction with life [9]. It consists of five items that evaluate, according to patient’s own global judgment, the level of satisfaction with life.

Questions used in the test to evaluate life satisfaction are: First, “In most aspects of life, is my life close to an ideal perception?”, secondly, “Are my life conditions excellent?”, third, “Am I satisfied with my life?”, fourth, “Have I achieved, along my life, the things I consider important” and fifth, “If I could live again would I change anything of my life?” [9,10]. All these questions have seven different predetermined alternative answers punctuating from 1 to 7, being 1 strongly disagree, 2 disagree, 3 slightly disagree, 4 neither agree nor disagree, 5 slightly agree, 6 agree and 7 strongly agree. At the end of the test the results obtained in each question are summed with
an establish diagnosis for each range of score being from 5–9: Extremely unsatisfied, from 10–14: Unsatisfied with life, from 15–19: below average, for 20–24: Average, 25–29: very satisfied and from 30–35: extremely satisfied [11]. The reliability of this scale is high, with a Cronbach’s alpha coefficient up to 82% [10,11].

**Own perception of health status**

**Visual analogue scale (EQ-5D/VAS) [12]**: This is a patient’s self-rated overall health status based on a visual analogue scale (VAS) ranking from 0 to 100, being 0 the worst self-rating health status and 100 the best self-rated health status [13]. This test belongs to the EQ-5D test which is one of the most used generic health-related quality-of-life instruments worldwide. EQ-5D is a standardized generic instrument composed of three components [12,13]. The first component explores the state of health, the second explores a self-rated overall health status using the visual analogue scale and the third component collects demographic information, age, sex, residence, occupation, family status and incomes contributing with general and demographic information of the studied group [14]. Due to its characteristics, the EQ-5D has achieved a great reputation for its simplicity, validity and reliability, geographic spread, high quality control of the assessment protocols and translations [15].

**Functional status**

**Barthel Index [16]**: Barthel Index (BI) is used to evaluate the capacity of a person in performing basic activities in daily life, obtaining a quantitative estimation of the subject’s level of dependency and, indirectly, the impact of health problems on the dependence state7. Barthel Index assesses the ability of a person to perform in a dependent or independent way (as well as the magnitude of dependence) 10 basic activities of the daily life. The categories evaluated are eating, mobility, personal hygiene, the capacity of going up and down stairs, dressing skills, and sphincter control [18]. The evaluated categories have between 2 to 4 ranges and the values assigned to each range depends on how much help and time is needed to perform these activities. Each category is evaluated with different ranges and the scores of each range can be 0, 5, 10 or 15 points. The final score can range from 0 to 100 classifying the severity of dependance (functional impairment) according to the score obtained. Those with 0–24 points are totally dependent (extremely severe functional impairment), 25–49 points with severe dependance (severe functional impairment), 50–74 points moderate dependance (moderate functional impairment) 75–90 average dependance (functional impairment below average) >90 minimum dependance (minimal functional impairment) and 100 not dependance (No functional impairment) [18]. It is an easily applicable method with a high level of reliability and validity, easy to interpret and to apply. It is used method for measuring physical incapacity in clinical practice as well as in epidemiological investigation and public health, obtaining a reliability of 88% [17,18].

**PPS (Palliative performance scale score) [19]**: This instrument is a modification of the Karnofsky Performance Scale. It was first introduced by Anderson and Downing in 1996 as a new tool for measurement of performance status in palliative care [20]. Its indicators are based on the performance status of the patient and has been used as prognostic tool, disease progression monitoring and in health care planning and administration. This a valuable clinical assessment tool in palliative care and many of other specialties have already incorporated PPS as standard tool in their practice [20].

The test explores five categories: Mobilization, evidence of disease, self-care, food intake, and level of consciousness. The score ranges from 0 to 100 in an interval of ten points according to the observer findings in each category. Each category contains 10 different scenarios with its respective score and the final score is obtained by selecting the scenario that best fits to patient’s clinical and functional situation. It has shown a reliability around 96% [21].

**Comorbidity burden**

**Charlson Index [22]**: It was created with the objective of developing a prognostic instrument for comorbidities that, individually or combined, could affect the risk of short–term mortality [23]. Charlson comorbidity index is assessed based on the age and other 19 medical conditions which are cataloged into four groups according to the survival impact assigned to each disease, with a minimum score of 0 and maximum score of 37 [23,24]. These conditions can be obtained through clinical records, medical–administered databases, and interviews. The total score is the sum of all clinical entities of the patient resulting in 10-year survival probability with an acceptable interobserver reliability of 95% [23,24].

**Statistical analysis**

Continuous symmetric variables were described as mean ± standard deviation or median and interquartile range if asymmetric. T-test was used for comparing significative differences of medians from symmetric continuous variables, U–Mann–Whitney was used to compared significative differences in medians with non–symmetric distribution and chi–square for comparison of qualitative variables. In mental health disorders explored with DASS–21 scale, SWLS scale and self–rated health state by VAS, patients were classified according to scores obtained in each test in two groups: A pathological group and a healthy group. The divided groups which were obtained according to scores on test are specified in each instrument. Variables as age, functional impairment, comorbidity burden, sex, time on HD, were collected and compared looking for significative differences between both groups.

Once instruments were applied to studied population, they were categorized according to the score obtained in each test as follows. For DASS–21 scale subjects who obtained a score ≤ 6 points in depression scale were considered not depressed while subjects with score ≥ 7 were considered depressed. For anxiety scale, subjects who obtained a score ≤ 4 were considered without anxiety and those with score ≥ 5 were anxious. Finally, in stress scale, subjects with a score ≤ 9 were considered...
not stressed while those with score ≥ 10 were considered as stressed patients.

On SWLS test for satisfaction with life screening subjects who obtained a score ≥ 20 points were catalogued as “satisfied patients” and were compared for further analysis with patients who obtained scores <20 which were considered as “unsatisfied patients”.

On EQ/5D–VAS, used as a patient’s self-rated health status, patients were divided in four groups according to self-rated score obtained. Patients with a self-rated score >80 were considered with good self-rated health, those with 60–79 were considered with mild self-rated health impairment, those with 30–59 were considered with moderate self-rated health impairment, those with 0–29 were considered with severe self-rated health impairment. For statistical analysis patients were divided in two groups according to score obtained, those with score ≥70% were considered with impaired self-rated health impairment. For statistical analysis patients were divided in four groups according to self-rated score obtained, those with score <70% were considered with impaired self-rated health state and those with score ≥70% were considered with good self-rated health state.

Results

A total 143 chronic hemodialysis patients were receiving treatment in study center and were initially considered for study. Four patients were excluded for the following reasons: One had severe cognitive impairment and three had received dialysis treatment for less than 6 months in the center of study. Finally, 139 patients fulfilled inclusion criteria and participated in the study.

There was a male predominance in population studied (55%), a third of patients were single and more than a half were married (52%). A third of studied population completed high–school education (32%). Psychotropics, antidepressants, benzodiazepines and antipsychotics prescription prevalence was 4% for each one of them. A quarter of patients were unemployed, 40% of patients had a formal job, 12% had visited a mental health professional previously with 7% who had visited a psychiatrist and 5% to a psychologist. Table 1 shows baseline characteristics of studied population. The studied center had previous prevalence of depression and anxiety of 12%, obtained before COVID 19 pandemic.

Prevalence of mental health disorders found in the study are shown in Table 2. To note, depression prevalence was found to be present in 28% of patients, anxiety prevalence was 37% and 34% of stress prevalence was observed. Unsatisfaction with life prevalence was 20% and 53% of studied individuals scored <70% on self-rated health state.

Age was not significantly related with prevalence of moderate/severe depression (p=0.37), moderate/severe anxiety (p=0.89) moderate/severe stress (p=0.44) unsatisfaction with life (p=0.94) and overall health status self-rating scale score (p=0.20).

Sex was not significantly related with prevalence of moderate/severe depression (p=0.52), moderate/severe anxiety (p=0.69) moderate/severe stress (p=0.23) unsatisfaction with life (p=0.59) and overall health status self-rating scale score (p=0.65).

Time in HD treatment was significatively related with moderate/severe anxiety prevalence (p=0.044), these differences were observed more significatively in patients with more than 92 months in HD treatment. Time in HD was not significative related with prevalence of moderate/severe depression (p=0.90), moderate/severe stress (p=0.54) unsatisfaction with life (p=0.21) and overall health status self-rating scale score (p=0.26).

Comorbidity, measured by modified Charlson Index score, was not significative related with prevalence of moderate/severe depression (p=0.72), moderate/severe anxiety (p=0.10),

| Table 1: Baseline characteristics of studied population. |
|---------------------------------|-------------|
| **Population studied (N=139)**  | **Results** |
| Age (years)                     | 56(±15.7)   |
| Sex (%)                         | (55)        |
| - Male                          | 73(±47.1)   |
| Time in hemodialysis (months)   | 28          |
| Etiology (%)                    | 17          |
| Diabetes                        | 24          |
| Hypertension                    | 31          |
| Glomerular                      | 97          |
| Vascular Access (%)             | 67          |
| FAV                             | 3           |
| Catheter                        | 25          |
| Employment situation (%)        | 40          |
| - Unemployed                    | 35          |
| Active                          | 1           |
| Retired                         | 32          |
| Education (%)                   | 67          |
| Illiterate                      | 3           |
| High School                     | 12          |
| Other                           | 17          |
| Civil status (%)                | 28          |
| - Single                        | 52          |
| Married                         | 3           |
| Widower                         | 12          |
| Other                           | 12          |
| Previous mental health disorder (%) | 88      |
| Anxiety                         | 12          |
| Depression                      | 12          |
| Previous psychotropics prescribed (%) | 12  |
| None                            | 87 (±18.5)  |
| Antidepressant/Benzodiazepine/ Antipsychotic | 5 (±2.1)   |
| Palliative Performance score. (/100) | 93 (±14.7) |
| Modified Charlson Index score    | 61.1 (±12.8) |
| Barthel Index (/100)            | 93 (±14.7)  |
| Dry Weight (Kg)                 | 61.1 (±12.8) |

HD: Hemodialysis. Values expressed in percentage or mean +/- standard desviation.

Citation: Santacruz J, Santacruz S, Coloma G, Reinoso P, Sulbarán C, et al. (2021) Functional impairment associated with increased severity of mental health disorders in Latin American chronic hemodialysis patients. Arch Renal Dis Manag 6(1): 003-009. DOI: https://dx.doi.org/10.17352/2455-5495.000035
Table 2: Results of instruments applied on chronic hemodialysis patients for screening of mental health disorders.

| Instruments applied: | None-Mild Score | Moderate Score | Severe Score | Extremely Severe Score |
|---------------------|-----------------|----------------|--------------|------------------------|
| DASS-21 (Depression) | 0-8             | (7-10)         | (11-13)      | (14-)                  |
| DASS-21 (Anxiety)   | (0-4)           | (5-7)          | (8-9)        | (10-)                  |
| DASS-21 (Stress)    | (0-9)           | (10-12)        | (13-16)      | (17-)                  |
| Satisfaction with life scale score (SLS) | ≥20 (Satisfied) | 15-19 (Below average) | 10-14 (Unsatisfied) | 5-9 (Extremely Unsatisfied) |
| EQ-SD/VAS Patient’s self-rated health score/100 (%) | ≥80% (Good health) | 40-79% (Mild impairment) | 30-59% (Moderate impairment) | ≤29% (Severe impairment)
| DASS-21: Depression, anxiety, stress scale score. VAS: Visual analogue scale from Patient’s self-rated disorders in Latin American chronic hemodialysis patients. Arch Renal Dis Manag 6(1): 003-009. DOI: https://dx.doi.org/10.17352/2455-5495.000035

Table 3: Variables significantly related with mental health disorders, unsatisfaction with life and impaired health-status perception in chronic hemodialysis population studied.

| Variables related with mental health disorders, life satisfaction and impaired health-status: Moderate/severe depression: | p-value |
|---------------------------------------------------------------|---------|
| • Functional impairment:                                      | 0.048*  |
| - Lower Barthel Index score vs none/mild depression.          |         |
| Moderate/severe anxiety:                                      | p-value |
| • Functional impairment:                                      |         |
| - Lower Barthel Index vs those with none/mild stress          | 0.025*  |
| - Lower Palliative performance scale score vs those with none/mild stress | 0.030*  |
| *Unsatisfaction with life:                                    | p-value |
| • Functional impairment:                                      |         |
| - Lower Barthel Index vs those satisfied with life             | 0.017*  |
| - Lower Palliative Performance Scale score vs those satisfied with life | 0.041*  |
| *Self-rated health-status <70%                                 | p-value |
| • Functional impairment:                                      |         |
| - Lower Barthel Index vs those scored ≥ 70%                    | 0.022*  |
| - Lower Palliative Performance scale score vs those scored ≥ 70% | 0.003*  |
| *Satisfaction with life scale score (SWLS), Euro-QOL visual analogue scale (EQ-5D/ VAS). *: p-value calculated with t-student. #: p-value calculated with U-Mann-Whitney test

Presence of moderate/severe anxiety wasn’t related with Barthel Index score in patients (p=0.29) neither PPS score (p=0.07). Moderate severe depression wasn’t significantly related with PPS score (p=0.06). Table 3 shows variables significantly related prevalence of moderate/severe mental health disorders studied as well with unsatisfaction with life and self-rated health state <70%.

Discussion

This study shows the relationship between a prolonged time in dialysis and a significative increase in prevalence of moderate/severe anxiety (>7.6 years), as well as the relationship of impaired functional status and the increased prevalence of moderate/severe mental health disorders (depression and stress), unsatisfaction with life and decreased self-rated health state in a cohort of Latin American chronic hemodialysis patients.

Several studies have demonstrated similar prevalence of anxiety and depression in chronic dialysis population as the ones showed in our study [25-27]. These studies have also shown that stress prevalence was lower (20%-25%) than the one found in our study where it was the second most prevalent mental health alteration (34%).

The higher stress prevalence found in this cohort may be explained for several reasons. First, the COVID-19 pandemic outbreak. COVID-19 has significantly increased the prevalence of stress in HD population due to the different new stressful situations associated with the disease (isolation, death of closer relatives, lack of current and validated information, etc) [3,25,28]. This study was performed during COVID-19 pandemic, almost one year after its outbreak, so this new stressful situations in current life have directly influenced in studied population resulting in a higher prevalence of stress when compared with other series that were developed before COVID-19 outbreak [25-27]. Secondly, this higher stress prevalence may be due to absence of accurate tools to face stress in the hemodialysis patients studied and third, other studies have used different instruments with different specifity and sensibility on detecting mental health disorders [25-27].

Chronic dialysis patients have become older and more comorbid in the last years. Several factors such as aging, high comorbidty burden, ESKD associated comorbidities and ESKD progression are associated with the presence of considerable comorbidity burden, ESKD associated comorbidities and ESKD progression are associated with the presence of considerable.
functional impairment [1]. Other series have indirectly linked the association of functional impairment and high comorbidity burden with higher prevalence of mental health disorders such as anxiety and depression [26–29]. In our study we have demonstrated a significantly lower scores on functional status tests of patients with moderate/severe depression and stress vs those without or mild alterations. Also, functional status was significantly lower in patients who showed moderate/severe unsatisfaction with life as in those who showed a lower self-rated health–state score, exposing the link between functional impairment with mental health disorders prevalence, low self-rated health state and unsatisfaction with life which have influence in quality of life and early mortality on HD patients [25–29].

Our study shows that there is a significative link between a higher moderate/severe anxiety prevalence in patients with a prolonged time in dialysis (over 7.6 years). Previous series haven’t found any relation between time in dialysis treatment and an increased prevalence of anxiety [3,4]. This difference observed in our study could be explained by the fact that local transplant programs are neither effective nor active, resulting in prolonged stays on dialysis treatment whereas previous studies were developed in Spain [3,4], country known for their effective and very active transplant program that avoid such prolonged stays on dialysis treatments [30].

Limitans of the study were a small sample size, only HD population studied, which could compromise external validity, also, COVID–19 pandemic outbreak was another important limitation due to the forced use of personal special equipment (facemasks, face–shields) that negatively committed the communication with patients. Also, fear of getting infected with COVID–19 disease was another limitation which was caused for the fact of being in a small quiet room for solving the tests causing annoying and disturbance to studied patients. One more limitation was the lack of time for test response due to the rush of patients to begin dialysis session.

The strengths of the study were a homogenous population studied, the use of validated instruments to measure the pathologies analyzed and the fact that functional impairment was objectively measured and compared between pathological and non-pathological groups to analyze the presence of significative differences.

To conclude, this study demonstrates a clear relationship between a decreased functional status and a higher prevalence of moderate/severe stress and depression, unsatisfaction with life and low self–reported health–state as well as an increased prevalence of moderate/severe anxiety in patients with HD stays longer than 7.6 years. We consider that specific programs of premature identification and effective intervention in this rising elderly, functional impaired and high comorbid chronic dialysis population, might decrease the severity of mental health disorders, unsatisfaction with life, and low self-reported health–state. We suggest that psychological services should provide effective tools to deal with stressful situations to hemodialysis patients. More research studies are needed in this topic.

References

1. Muthukumaran A, Natarajan G, Thanigachalam D, Alavudeen S, Jeyachandran D, et al. (2021) The Role of Psychosocial Factors in Depression and Mortality Among Urban Hemodialysis Patients. Kidney Int Rep 6: 1437–1443. Link: https://bit.ly/3ks9W9C

2. Moya M (2017) Estudio del estado emocional de los pacientes en hemodiálisis. Enfermería Nefrología 48-56. Link: https://bit.ly/3j9J5sp

3. Perales C, Perales C, Duschek S, Reyes G, Reyes G (2013) Influencia de los factores emocionales sobre el informe de síntomas somáticos en pacientes en hemodiálisis crónica: relevancia de la ansiedad. Nefrología 33: 751-868. Link: https://bit.ly/3mH5BNe

4. Perales C, Duschek S, Reyes G (2016) Calidad de vida relacionada con la salud en la enfermedad renal crónica: relevancia predictiva del estado de ánimo y la sintomatología somática. Revista de la Sociedad Española de Nefrología 275-282. Link: https://bit.ly/3dkfJ4R

5. Román F, Santibañez P, Vinet E (2016) Uso de las Escalas de Depresión Ansiedad Estrés (DASS-21) como Instrumento de Tamizaje en Jóvenes con Problemas Clínicos. Acta De Investigación Psicológica 6: 2325 - 2336. Link: https://bit.ly/3sPoeyF

6. Mota L, Antunes A, Álves C, Lopes P, Silva S, et al. (2019) Effect of humor intervention on well-being, depression, and sense of humor in hemodialysis patients. Revista de la Sociedad Española de Enfermería Nefrológica 22: 256-265. Link: https://bit.ly/3jmiq9Q

7. Román F, Vinet E, Alarcón A (2014) Escalas de Depresión, Ansiedad y Estrés (DASS-21): Adaptaclon y propiedades psicométricas en estudiantes secundarios de temuco. Revista Argentina de Clínica Psicológica 13: 179-190. Link: https://bit.ly/3DKf5FS

8. Alpi S, Parada N, Quiceno J, Riveros F, Vera L (2019) Escala de satisfacción con la vida (SWLS): análisis de validez, confiabilidad y baremos para estudiantes universitarios de Bogotá. Psicógnose 22: 1-20. Link: https://bit.ly/2XQTVXR

9. Cárdenas M, Barrientos J, Bilbao A, Páez D, Gómez F, et al. (2012) Estructura Factorial De La Escala De Satisfacción Con La Vida En Una Muestra De Jóvenes con Problemas Psicológicos. Revista de la Sociedad Española de Enfermería Nefrológica 27: 22-26. Link: https://bit.ly/3mEu3zg

10. Sánchez M, García J, Valverde M, Pérez M (2014) Enfermedad crónica: satisfacción vital y estilos de personalidad adaptativos. Clínica y Salud 25: 85-93. Link: https://bit.ly/3kJ3LAI

11. Sánchez M, García J, Valverde M, Pérez M (2014) Enfermedad crónica: satisfacción vital y estilos de personalidad adaptativos. Clínica y Salud 25: 85-93. Link: https://bit.ly/2WvoacT

12. Dermawan F, Hunfeld J, Iskandarsyah A, Sahidah T, Supardi S, et al. (2017) original research article The Indonesian EQ-5D-5L Value Set. Pharmacoeconomics 1-13.

13. Martínez F, Roy I, Torres J (2020) Terapia sustitutiva y su impacto en la calidad de vida de pacientes con enfermedad renal crónica terminal. Atención Familiar 22: 22-26. Link: https://bit.ly/3kvEuCp

14. Pradas R, Antoñanzas F, Martínez M (2009) Utilización del cuestionario European Quality of Life-5 Dimensions (EQ-5D) para valorar la variación de la calidad de vida relacionada con la salud debida a la gripe. Gaceta Sanitaria 104–108.

15. Cabasés JM (2015) El EQ-5D como medida de resultados en salud. Gaceta Sanitaria 29: 401–403. Link: https://bit.ly/2UQyOQ3
16. Ruzafa J, Moreno J (1997) VALORACIÓN DE LA DISCAPACIDAD FÍSICA: EL INDICE DE BARTHÉL. Revista Española de Salud Pública 71: 177-137. Link: https://bit.ly/38Yw6H8

17. Contreras A, López P, Crespo R (2014) Análisis de la relación entre nivel de dependencia del paciente en hemodiálisis y sobrecarga del cuidador principal. Enfermería Nefrológica 17: 98-103. Link: https://bit.ly/3ykdf2

18. Trigás M, Ferreira L, Mejide H (2011) Escalas de valoración funcional en el anciano. Galicia Clínica 72: 11-16. Link: https://bit.ly/3ykdiYg

19. Ho F, Lau F, Downing M, Lesperance M (2008) A reliability and validity study of the Palliative Performance Scale. BMC Palliative Care 4: 1-10. Link: https://bit.ly/3sTc2QR

20. Bernabeu M, Ruiz A, Murcia J, Hernández C, Barón B, et al. (2010) Precisión de los criterios definitorios de pacientes con enfermedades médicas no neoplásicas en fase terminal. Proyecto PALIAR. Revista Española de Geriatría y Gerontología 1-10. Link: https://bit.ly/38hQphF

21. Fiorentino M, Pentakota S, Moxenthal A, Glass NE (2020) The Palliative Performance Scale predicts mortality in hospitalized patients with COVID-19. Palliat Med 34: 1228–1234. Link: https://bit.ly/38kRe1w

22. Chacón M, Parodi D, Runzer F, Parodi J, Rojas J, et al. (2020) Riesgo de mortalidad según el índice de Charlson en comparación con el índice de fragilidad en pacientes adultos mayores del Centro Médico Naval entre los años 2010 al 2015. Horiz Med 20: 1-10. Link: https://bit.ly/3zlUDkk

23. Rosas O, González E, Brito A, Vázquez O, Peschard E, et al. (2011) Evaluación de la comorbilidad en el adulto mayor. Revista médica del Instituto Mexicano del Seguro Social 49: 153-162. Link: https://bit.ly/3ymM50I

24. Martínez Y, Toapanta N, Nava N, Barbosa F, Montes R, et al. (2016) Supervivencia de pacientes de edad avanzada (≥70 años) con enfermedad crónica estadios 4-5: diálisis vs tratamiento conservador. Revista de la Sociedad Española de Nefrología 283-291. Link: https://bit.ly/3jnWc6X

25. Rivera A, López M, Sandoval R (2012) Desajuste psicológico, calidad de vida y afrontamiento en pacientes diabéticos con insuficiencia renal crónica en diálisis peritoneal. Salud Mental 35: 329-337. Link: https://bit.ly/3mDYaQl

26. Rebollo P, Mon C, Álvarez F, Vázquez A, Fernández M, et al. (2001) Síntomas físicos y trastornos emocionales en pacientes en programa de hemodiálisis periódicas. Revista Nefrología 21: 1-222. Link: https://bit.ly/2WvRs00

27. Vallejos J, Ortega E (2018) Niveles de depresión y factores sociodemográficos en pacientes con insuficiencia renal crónica en tratamiento de hemodiálisis en Perú. Ciencias Psicológicas 12: 205-214. Link: https://bit.ly/3sRsy05

28. Maldonado M, Ossorio M, del Peso G, Santos C, Álvarez L, et al. (2020) Incidencia y resultados de la COVID-19 en una unidad de diálisis domiciliaria en Madrid (España) durante el pico de la pandemia. Nefrología 41: 329-336. Link: https://bit.ly/2WvUaFR

29. Fishbein L (1994) Depression in End-Stage Renal Disease Patients. Semin Dial 181-185. Link: https://bit.ly/3kSb0Ds

30. Ministerio de sanidad y consumo. (2006, 01 04). Senefro. Link: https://bit.ly/38k4dbI

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Citation: Santacruz J, Santacruz S, Coloma G, Reinoso P, Sulbarán C, et al. (2021) Functional impairment associated with increased severity of mental health disorders in Latin American chronic hemodialysis patients. Arch Renal Dis Manag 6(1): 003-009. DOI: https://dx.doi.org/10.17352/2455-5495.000035