Quality of Life and Associated Risk Factors in Hemodialysis: Perspective from a Center in the Dominican Republic

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Abstract

Background: Chronic kidney disease has an overall prevalence of 10 %. It can progress to a condition called end-stage renal disease. Therapies such as hemodialysis are necessary at this stage. Our study aims to measure the quality of life of patients on hemodialysis.

Methods: We conducted an observational, cross-sectional study with 81 patients. Data was collected using a survey that included sociodemographic variables, the Center for Epidemiological Studies Depression Screening Index (CES-D), and the Kidney Disease Quality of Life (KDQOL-SF36). Data were analyzed using the software Epi Info™ 7.2, t-test, ANOVA, and correlation coefficient.

Results: The severity of symptoms is more significant in the female sex than in males (65.7117 vs. 74.2874). All of the components of the KDQOL-SF36 showed a negative correlation with the CES-D. Household income had a mild positive correlation with the scale (r = 0.2608, p = 0.0229). Physical activity was shown to be associated with the physical component of the scale (41.6346 vs. 35.7365, p = 0.0412). Patients with partners were associated with higher quality of life scores than single patients (53.6585 vs. 42.6783, p = 0.0348).

Conclusion: This is the first study conducted in the Dominican Republic to analyze the variables affecting the quality of life in patients in hemodialysis units. The severity of the symptoms increased in female patients, and patients without a partner are associated with worse quality of life scores.

Keywords: Nephrology, Hemodialysis, Quality of Life, Risk factors, Dominican Republic.

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Calidad de vida y factores de riesgos asociados en la hemodiálisis: perspectiva de un centro en la República Dominicana

Resumen

Introducción: la enfermedad renal crónica presenta una prevalencia global del 10 % y puede progresar a una condición llamada enfermedad renal en etapa terminal. Terapias como la hemodiálisis son necesarias en esta etapa. Nuestro estudio tiene como objetivo medir la calidad de vida de pacientes en hemodiálisis.

Método: se realizó un estudio observacional transversal, en el cual se recolectaron los datos de 81 pacientes. Para esto, se aplicó un cuestionario con las variables sociodemográficas, así como la escala CES-D y la escala KDQOL-SF36. Los datos se analizaron con el software Epi Info™ 7.2. mediante la prueba t, ANOVA y el coeficiente de correlación.

Resultados: la gravedad de los síntomas fue mayor en el sexo femenino que en el masculino (65,7117 vs. 74,2874). Los componentes de KDQOL-SF36 mostraron una correlación negativa con la puntuación de la escala CES-D. El ingreso del hogar tuvo una correlación positiva leve (r = 0,2608, p = 0,0229). La actividad física mostró estar asociada con la escala (41,6346 vs. 35,7365, p = 0,0412). Los pacientes con parejas tuvieron mejor calidad de vida que los pacientes solteros (53.6585 vs 42.6783, p = 0.0348).

Conclusiones: este es el primer estudio realizado en la República Dominicana con el fin de evaluar las variables que afectan la calidad de vida de los pacientes en hemodiálisis. La gravedad de los síntomas aumentó en pacientes del sexo femenino y vivir sin pareja estuvo asociado a un menor puntaje en las escalas de calidad de vida.

Palabras clave: Nefrología, hemodiálisis, calidad de vida, factores de riesgo, Republica Dominicana.

Introducction

Chronic kidney disease (CKD) has a global prevalence of 10 % [1] and a local prevalence of 7.7 % [2]. It is a complication of prevalent chronic conditions such as hypertension and diabetes mellitus [3]. This progressive disease eventually leads to End-Stage Kidney Disease (ESKD). At this stage, due to the deterioration of the glomerular filtration rate, there is a massive accumulation of toxic metabolites that cause a diverse array of clinical manifestations that significantly decrease the quality of life of patients [4]. Patients with ESKD must choose between different modalities of renal replacement therapy, hemodialysis (HD), and peritoneal dialysis (PD). These therapies are intrusive in the patient's life because of their long duration or frequency, dietary restrictions, lifestyle modifications, adverse effects, and complications that can occur during these sessions [1].

The World Health Organization defines the quality of life (QoL) as "individuals' perception of their position in life in the context of the culture and value systems in which they live and concerning their goals, expectations, standards, and concerns." QoL in patients with ESKD is commonly assessed with the family of KDQOL questionnaires developed by RAND Corporation and the University of Arizona. This instrument is composed of 36 items that evaluate mental and physical health and three subscales that assess symptoms, the burden of kidney disease, and the effects of kidney disease, where higher scores reflect better health-related QoL [5, 6].

Latin America has one of the highest burdens of CKD, and there is a shortage of local studies describing the situation [2]. Currently, no study in our country has attempted to measure the QoL in hemodialysis patients; furthermore, there are no standardized guidelines to manage CKD patients. On anecdotal evidence, the practice of improving QoL as a therapeutic goal is rare in our public hemodialysis units. This study was conducted to show the associated factors of QoL in our population and serve as a baseline for further studies. It is our interest that our findings could help guide our decision-making towards measures that will help to increase the QoL of our patients because, as studies suggest, low QoL scores are associated with worse prognosis [7].

Methods

The study was an observational, cross-sectional study in the nephrology unit of the Hospital Salvador B Gautier, the main internal medicine referral hospital in the Dominican Republic.

Inclusion criteria:

- Patients older than 18 years old

- Patients who agreed to participate in the study by signing an informed consent form

- Patients who have completed at least one month of hemodialysis

Exclusion criteria:

- Patients who do not meet any inclusion criteria

- Patients with cognitive impairment

- Patients with a history of kidney transplant

No sampling method was used in this study. All the patients who agreed to participate in the study were selected. Of a total population of 106 patients in the hemodialysis unit, 88

agreed to participate in the study; seven were excluded due to insufficient information, and 81 were used for the final analysis.

In the study, we gathered data on sex, age, physical activity (described as any physical activity to exercise in the previous month), diabetes and hypertension, education level, marital status, monthly household income, poverty (defined as household income lower than the national poverty line of 36,584.1 RDP per month (648.08 USD) [8, 9], the severity of depressive symptoms as assessed by the CES-D Score, a scale Published in 1977 for the first time by Radloff LS [10], that has been validated in hemodialysis patients [11], and QoL as assessed by the KDQOL Form 36 score [6]. This instrument was created by RAND Corporation and the University of Arizona in the USA. It consists of 36 items, with two scales that measure general physical and mental health and three specific scales that measure kidney disease effect, burden, and symptoms.

Data collection and analysis

The data was collected using a structured, paper-based questionnaire that included the sociodemographic variables, the CES-D scale, and the KDQOL-SF36 scale. Data was then analyzed with the software Epi Info™ 7.2.

The data analysis was performed using t-test and ANOVA to analyze quantitative and qualitative variables and Pearson correlation to analyze quantitative variables.

Bioethical implications

This study was conducted according to the ethical principles of confidentiality, no maleficence, autonomy, and justice. It complied with the Helsinki agreements on research in humans. The patients' names were taken on the data collection to identify records, but they did not make it to the final report. Patients had to sign an informed consent form to participate in the study. The study had the approval of the hospital's ethics committee (IRB 10/2021:01).

Results

Baseline characteristics of the population are shown in Table 1, while KDQOL results and their correlation to the study variables are shown in Tables 2 and 3, respectively.

Table 1. Baseline characteristics

Patients N = 81		
	No.	**%**
Age	51.06 ± 14.35	
CES-D Scale	14.83 ± 10.61	
Hemodialysis vintage	52.39 ± 67.79	
Male sex	56	69.14
Diabetes	20	24.69
Physical activity	13	16.05
Marital status, married or domestic partnership	43	53.09
Marital status, single or widow(er)	38	46.91
Higher education	7	8.64
Below the national poverty line	77	95.06
Patients N = 79		
Monthly household income	RD$13,310 (USD 235.78)	

Source: Own elaboration

Table 2. KDQOL Scale Results

Scale (number of items)	**Mean**	**Median**	**SD**	**n**
Symptom/problem list [12]	71.24	68.75	13.89	81
Effects of kidney disease [8]	59.10	59.38	21.00	79
Burden of kidney disease [4]	45.29	43.75	24.68	81
SF-12 Physical Health Composite	36.26	35.54	9.70	81
SF-12 Mental Health Composite	46.35	46.77	11.39	81

Source: Own elaboration

Discussion

The QoL of patients suffering from CKD is deeply affected. Our findings align with previous ones in the Latin American region [12–14], indicating that QoL should be considered in the clinical setting in an objective and standardized way, as there is enough evidence of this association. Moreover, while there are some knowledge gaps, it seems that, more than anything, our patients need an improvement in care. We are using evidence-based guidelines and protocols that involve the QoL and a more holistic model of care.

Our findings suggest the importance of psychosocial risk factors in patients' QoL, which feeds a debate where some authors advocate for a biopsychosocial approach to these pa-

Table 3. Association between depression and sociodemographic factors and KDQOL scores

	Effects	Burden	Symptoms	Mental composite	Physical composite
CES-D					
*r**	-0.44	-0.46	-0.46	-0.63	-0.3
P-value	<0.00001**	<0.00001**	<0.00001**	<0.00001**	0.0069**
Sex					
Male	59.2 ± 21.7	48.9 ± 23.0	74.2 ± 13.12	46.8 ± 10.8	38.60 ± 9.38
Female	60.6 ± 19.6	47.8 ± 22.4	65.7 ± 13.9	46.3 ± 12.6	32.46 ± 8.65
P-value	0.79	0.84	0.01**	0.86	0.0079**
Age					
*r**	0.0194	0.0341	-0.0201	-0.2089	-0.0553
P-value	0.86	0.76	0.86	0.0664	0.6308
HBP					
Yes	59.07 ± 20.28	48.31 ± 23.22	71.98 ± 14.01	47.26 ± 11.64	36.89 ± 9.52
No	62.05 ± 24.75	50 ± 20.88	70.08 ± 13.64	44.09 ± 9.67	35.91 ± 9.96
P-value	0.6348	0.8093	0.6456	0.4152	0.7314
DM					
Yes	59.87 ± 21.12	46.18 ± 22.80	68.75 ± 14.44	45.75 ± 11.02	37.76 ± 9.79
No	59.53 ± 21.15	49.35 ± 22.84	72.64 ± 13.66	47.01 ± 11.50	36.36 ± 9.52
P-value	0.9529	0.6081	0.2818	0.6707	0.5746
Income					
*r**	-0.0158	0.0833	0.163	0.2608	-0.0151
P-value	0.8923	0.4802	0.1595	0.0229**	0.8972
Physical activity					
Yes	55.47 ± 25.53	56.24 ± 28.63	75.64 ± 15.05	45.28 ± 13.95	41.63 ± 8.00
No	60.38 ± 20.21	47.02 ± 21.23	70.85 ± 13.61	46.97 ± 10.82	35.73 ± 9.57
P-value	0.4603	0.1844	0.2586	0.6256	0.0412**
Marital status					
Alone	59.28 ± 21.56	42.67 ± 23.60	71.30 ± 13.30	45.87 ± 11.30	38.64 ± 10.52
Partner	59.89 ± 20.80	53.65 ± 20.91	71.92 ± 14.48	47.55 ±11.43	35.15 ± 8.48
P-value	0.8999	0.0348**	0.8469	0.5181	0.109
Education					
Primary or below	59.89 ± 20.25	49.28 ± 25.48	70.07 ± 14.01	44.82 ± 10.53	35.51 ± 10.11
Secondary or above	59.37 ± 21.90	48.01 ± 20.36	73.12 ± 13.76	48.38 ± 11.86	37.80 ± 8.98
P-value	0.9146	0.8104	0.3275	0.1672	0.2913
HD Vintage					
*r**	0.1257	0.0917	0.1049	0.0556	-0.0195
P-value	0.2762	0.4306	0.3606	0.6286	0.8656

Note. *Correlation coefficient (r), ** p <0.05
Source: Own elaboration

tients [12], even recognizing the importance of economic and work-related factors [15]. In contrast, others suggest that the emphasis of research should be on "medical" factors due to the clinician's inability to influence the socioeconomic aspect of patients16 positively.

The influence of economic aspects on health is an essential factor to consider, which needs to be inquired about in the medical record. A study showed a negative correlation between the mental composite portion of the KDQOL Scale with increased medical expenses and perceived lack of difficulty in handling medical expenses [17]. This finding is similar to our study's association with monthly income. Some studies show an association between employment and QoL, which could also be associated with income [18, 19]. Interestingly, it has been suggested that having a job, being active in society, and keeping the role previous to the need for dialysis, are more critical to QoL than the perception of money by the patient [15].

Also, the influence of having a partner seems essential, as we found an association between the burden of kidney disease and having a partner on the KDQOL score. This component of the KDQOL score assesses perceptions of frustration and interference of kidney disease in life [20]. In contrast, multiple studies show no association between partnership and QoL [17, 21]. One study even found decreased QoL outcomes in married individuals [22]. So even though this association may suggest that the presence of a partner reduces the perceived burden that the kidney disease has on the life of hemodialysis patients, it is probably confounded by good marital support, satisfaction, family support, and dynamics; studies are needed to prove this hypothesis.

Our study showed no association between education and KDQOL scores. A few studies in China showed decreased mental composite scores associated with lower education levels [22, 23]. Studies in Saudi Arabia and Taiwan showed that higher levels of education were associated with higher scores of QoL [21, 24]. This association could be because higher education levels lead to a better understanding of their disease, treatment modalities, medication, and dietary adherence [25].

In our findings, biological factors such as sex and age or comorbidities such as diabetes and hypertension posit more questions than answers. We found that female patients from our sample had more symptoms than male patients, consistent with the results found in studies in Saudi Arabia, where females also had higher scores in the burden and effects components [21, 26]. It remains unknown despite being stated in previous studies, with some authors proposing a psychological cause and others refuting this explanation [15]. There was no association with the KDQOL in our study parameters for age. Some authors have found better QoL scores in elderly patients, suggesting that 'patients' understanding of the disease, the acceptance of their limitations, and decreased emotional ability are possible explanations for this association [27, 28]. Some studies have found increased levels of QoL in younger years than in older years [17, 29], with similar results in studies in Nepal and Saudi

Arabia [17, 30, 31]. The lack of consistency in the findings suggests that more studies are required to test this hypothesis.

There was no association with hemodialysis vintage, similar to other studies [17, 23]. We did not find a study that showed an association. The lack of association may be related to the development of better coping mechanisms in older hemodialysis patients, congruent with the above-stated reasons for the age association.

While many studies have shown an association with comorbidities [23, 29], some describe that hypertension and diabetes were associated with worse results regarding pain and work status aspect and have been found to affect the QoL more broadly [13, 32]. Our study found no association between hypertension or diabetes and KDQOL parameters.

All five components of the KDQOL scale showed a negative correlation with increased scores on the CES-D scale, the strongest of these correlations being with the mental component of the scale (r = -0.63), suggesting the resemblance of the outcomes that these two scales assess. A study in geriatric patients showed that depression was associated with lower levels of QoL using the CASP-16 score [33]. Another study in Egypt showed a correlation between higher scores of depression using Beck Depression Inventory-II and lower scores of QoL using HRQOL-SF score [34]; in contrast with our research, the study did not find an association with physical problems. We hypothesize that the association between these two scales may be due to various factors, ranging from the similarity of the scales parameters, confusion between uremic and depressive symptoms, or an effect of depression on the QoL of patients [35].

As expected, our study's physical composite of the KDQOL scale was associated with physical activity. Multiple studies have shown this association, including one published by the Spanish Association of Nephrology, where they concluded that exercise positively influences patients' QoL [36]. Nevertheless, some studies differ. A large randomized clinical trial evaluated the effects of exercise on QoL using the KDQOL Version 1.3 and found no association [37], even though it did lead to better physical outcomes on walking distance and sit-to-stand tests. These findings suggest that even though patients have better exercise tolerance with increased physical activity, this does not necessarily correlate with better QoL scores. Further studies should be conducted to prove or disprove this hypothesis.

Limitations in this study are potential confounding variables, potential reporting bias from the patients, potential non-response bias due to the incomplete surveys that were excluded, da-

ta collection team inexperience (prior training was given), a relatively small population, and a cross-sectional design, which cannot draw causality. A single-center study with a low-income population may prevent generalization. Including other hemodialysis centers with different socioeconomic strata may reveal essential data that could help hone therapeutic goals according to different sociodemographic characteristics.

Conclusion

This is the first study conducted in the Dominican Republic to analyze the variables affecting the QoL in patients in hemodialysis units. We hope our findings will serve as a baseline for further studies on this crucial topic in our country. The severity of the symptoms increased in female patients, and patients without a partner are associated with worse QoL scores. On the other hand, our study did not find any associations between the KDQoL scale and the parameters of having higher education, comorbidities such as HTN and DM, and older patients.

Author's contributions

RJR: Conceptualization, methodology, project management, supervision, and writing (original draft, review, and editing); FELG: Conceptualization, methodology, project management, writing (original draft, review, and editing), visualization, and formal analysis; ARRM, CGRL, JNLP, YAD: Research, writing (original draft, review, and editing), and data curation.

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