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Original Research

Assessment of health-related quality of life and its determinants in patients with chronic kidney diseases

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Abstract
Aim: The aim of the study to assessment the quality of life in patients with chronic kidney disease .
Method : This study included 100 CKD patients and used a systematic random sampling method for quantitative analysis. Chi square and ANOVA were used to draw comparisons between two groups or more than two groups, respectively. Logistic regression analysis was utilized to identify the potential QoL determinants. A *p* value of 0.05 or lower was used to determine statistical significance.
Result : Among a total of 100 participants, the mean (±standard deviation) age was found to be 54.53 ± 13.47 years; 40 were male patients, and 60 were female patients. Diabetes Mellitus (60.9%), hypertension (55.2%), chronic glomerulonephritis (7.5%), chronic pyelonephritis (6.4%), and polycystic kidney disease (5.5%) were identified to be the most frequent disorders associated with CKD. The current study also demonstrated that the HRQOL score domains such as symptom problem list, the effect of kidney disease, and the burden of kidney disease decline significantly and progressively as the patient advances into higher stages of CKD ($p = 0.005$). A similar pattern was observed in work status, sleep, and general health ($p < 0.005$). This study also revealed that CKD imposes various restrictions on patients' day-to-day lives, particularly in terms of their physical and mental functioning, even in the initial stages of the disease.
Conclusion : This study demonstrated that a significant decrease in HRQOL was observed among CKD patients, with a progressive deterioration of HRQO L dimensions as the patient advances to end-stage renal disease. This study also revealed that CKD imposes various restrictions on patients' day-to-day lives, particularly in terms of their physical and mental functioning, even in the initial stages of the disease.
Keywords: HRQ OL – Health related quality of life , CKD – Chronic Kidney disease

Introduction

Chronic kidney disease is a progressive disease with no cure and high morbidity and mortality that occurs commonly in the general adult population, especially in people with diabetes and hypertension. Preservation of kidney function can improve outcomes and can be achieved through non-pharmacological strategies (eg, dietary and lifestyle adjustments) and chronic kidney disease-targeted and kidney disease-specific pharmacological interventions.[1] A plant-dominant, low-protein, and low-salt diet might help to mitigate glomerular hyperfiltration and preserve renal function for longer, possibly while also leading to favourable alterations in acid-base homoeostasis and in the gut microbiome.[2]

Pharmacotherapies that alter intrarenalhaemodynamic (eg, renin–angiotensin–aldosterone pathway modulators and SGLT2 [SLC5A2] inhibitors) can preserve kidney function by reducing intraglomerular pressure independently of blood pressure and glucose control, whereas other novel agents (eg, non-steroidal mineralocorticoid receptor antagonists) might protect the kidney through anti-inflammatory or antifibrotic mechanisms.[3,4] Some glomerular and cystic kidney diseases might benefit from disease-specific therapies. Managing chronic kidney disease-associated cardiovascular risk, minimising the risk of infection, and preventing acute kidney injury are crucial interventions for these patients, given the high burden of complications, associated morbidity and mortality,

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and the role of non-conventional risk factors in chronic kidney disease. When renal replacement therapy becomes inevitable, an incremental transition to dialysis can be considered and has been proposed to possibly preserve residual kidney function longer. [5]There are similarities and distinctions between kidney-preserving care and supportive care. Additional studies of dietary and pharmacological interventions and development of innovative strategies are necessary to ensure optimal kidney-preserving care and to achieve greater longevity and better health-related quality of life for these patients.hronic kidney disease is a general term for heterogeneous disorders affecting kidney structure and function.[6] The 2002 guidelines for definition and classification of this disease represented an important shift towards its recognition as a worldwide public health problem that should be managed in its early stages by general internists.[7] Disease and management are classified according to stages of disease severity, which are assessed from glomerular filtration rate (GFR) and albuminuria, and clinical diagnosis (cause and pathology). Chronic kidney disease can be detected with routine laboratory tests, and some treatments can prevent development and slow disease progression, reduce complications of decreased GFR and risk of cardiovascular disease, and improve survival and quality of life. Dietary protein intake has been the focus of several trials.[8] However, there is a lack of convincing evidence that the long-term restriction of protein intake (< 0.70 g/kg/day) delays the progression of chronic kidney disease. Thus, a protein-controlled diet (0.80–1.0 g/kg/day) is recommended. [9]There have been no studies about dietary salt restriction and development or progression of chronic kidney disease. However, the benefits of salt reduction as they pertain to the development and control of hypertension are available and are included in the guidelines. Diabetes mellitus (DM) and hypertension (HTN) are major risk factors for CKD. However, other risk factors include environmental factors, systemic infections, kidney stones, and nephrotoxins .[10] The main factors implemented in the pathophysiology of kidney injury are immunologic and genetic abnormalities, tissue hypoxia and decreased perfusion, drugs, high glucose, and other substances . CKD patients may present with various symptoms, including generalized weakness, pain, sleep disorders, anxiety, depression, and itching . CKD is diagnosed by meeting one or more of the following for more than a three-month duration: 1) renal structural or functional abnormalities, 2) glomerular filtration rate (GFR) of less than 60 mL/minute/1.73 m2 , and 3) albuminuria of ≥30 mg per day . There are five stages of CKD consistent with the GFR (Figure 1) CKD can be complicated by health conditions that can be prevented and treated early in the disease course.[11,12] Measures to manage CKD include screening high-risk groups (DM, HTN, kidney transplant, and family history of kidney disease) by testing for albuminuria, GFR, urine sediment, and serum creatinine (Cr); treating specific renal diseases; controlling progression; preventing and treating complications; and educating and preparing patients for renal replacement therapy (RRT) . In this literature review, we discussed the roles of nutritional interventions, lifestyle modifications, controlled HTN and DM, and medications in delaying the progression of CKD.[13]

Material and Methods

This study comprised 100 adult patients with chronic kidney disease. Eighteen 20 patients were excluded from the study. The reasons were incomplete biochemical analyses (15 patients), refusal to participate (5patients), refusal to answer all the questions (3 patients), and severe dementia (1 patient). Participants who were under the age of 20 or over 75 years, pregnant, had kidney transplants, used drugs excessively, or had a history of cancer were also excluded from the study.

In this study, we have utilized KDQoL SF-35 (1.3) (Table 1). The whole questionnaire is included as a supplement (Supplementary Materials). The physical dimensions of the symptom problem list, including the effect of kidney disease, the burden of kidney disease, sexual function, sleep, work status, overall health, and pain are typically combined to generate a physical composite summary (PCS). Additionally, the mental dimensions of cognitive function, the role of emotional health, patient satisfaction, quality of social interaction, social support, dialysis staff encouragement, emotional well-being, and social function are generally combined to generate a mental composite summary (MCS).

The SF-35 questionnaire is widely utilized and accepted in a wide range of contexts, enabling comparisons both within and between conditions. The recommendations of the National Kidney Foundation stress the need for the questionnaire to be reliable and accurate.

When applying the KDQoL-SFTM scoring process, which comprises translating pre-coded numeric values of responses to a range of 0–100, higher scores reflect a greater quality of life. This range is modified to meet the raw values of each item, with 0 being the lowest possible score and 100 denoting the greatest. Item 23, which has a pre-coded range of 1 to 7, is recorded by subtracting the raw value by 1, dividing the difference by 6, and then multiplying the outcome by 100. The sexual function scale's item 16 is crucial; if the answer is "no", the scale's score should be regarded as missing. The scores for each scale are determined by averaging their items.

Results

Among a total of 100 participants, the mean (±standard deviation) age was found to be 54.53 ± 13.47 years; 40 were male patients, and 60 were female patients. Diabetes Mellitus (60.9%),

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hypertension (55.2%), chronic glomerulonephritis (7.5%), chronic pyelonephritis (6.4%), and polycystic kidney disease (5.5%) were identified to be the most frequent disorders associated with CKD. The current study also demonstrated that the HRQOL score domains such as symptom problem list, the effect of kidney disease, and the burden of kidney disease decline significantly and progressively as the patient advances into higher stages of CKD ($p = 0.005$). A similar pattern was observed in work status, sleep, and general health ($p < 0.005$). This study also revealed that CKD imposes various restrictions on patients' day-to-day lives, particularly in terms of their physical and mental functioning, even in the initial stages of the disease.(Table 2).

Table 1. Items included in KDQOL SF-35

Scale	Number of Items	Specific Items Included
ESRD-Targeted Areas		
Symptom problem list	10	14a–l (l,m) *
Effects of kidney disease	7	15a–l
The burden of kidney disease	3	12a–e
Work status	3	21,22
Cognitive function	2	13b,d,f
Quality of social interaction	2	13a,c,e
Sexual function	1	16a,b
Sleep	5	17,18a–c
Social support	3	19a,c
Dialysis staff encouragement	1	24a,b
Patient satisfaction	1	23
36-item health survey		
Physical functioning	9	13a–l
Role physical	5	4a–d
Pain	1	7,8
General health	4	1,11a–e
Emotional well being	4	9b,c,d,f,e
Role of emotional health	3	5a–c
Social function	2	6,10
Energy/Fatigue	5	9a,e,g,i

Table 2. Distribution of baseline demographic characteristics based on CKD Stages

Variables	*n* (%)	CKD Stage 3 31(29.5%)	CKD Stage 4 20(19.0%)	CKD Stage 5 54(51.4%)	*p* Value
Gender					
Male	48(45.7)	14(13.3)	10(9.5)	24(22.9)	0.911
Female	57(54.3)	17(16.2)	10(9.5)	30(28.6)	
Age group					
Adults	63(60)	19 (18.1)	12 (11.4)	32 (19.5)	0.983
Elderly	42(40)	12(11.4)	8(7.6)	22(21.0)	
Hyperuricemia					
No	65(61.9)	25(23.8)	9(8.6)	31(29.5)	0.023
Yes	40(38.1)	6(5.7)	11(10.5)	23(21.9)	

CKD stage 5 patients had a higher mean age (55.07 ± 13.45) as compared to CKD stage 3 patients (51.83 ± 14.87). Regarding the other laboratory findings, CKD stage 5 patients reported higher baseline creatinine levels, lower hemoglobin levels, and higher serum uric acid levels. The urea levels were extremely high in patients with CKD stage 5 (164.26 ± 82.01) as compared to CKD stage 4 (87.70 ± 39.26) and CKD stage 3 (57.54 ± 41.06) (Table 3). The mean baseline estimated GFR was found to be 21.01 ± 16.70 mL/min/1.73 m^2.

Table 3. Distribution of baseline biochemical parameters based on CKD stages.

Parameter	N (105)	Stage 3 (*n* = 34)	Stage 4 (*n* = 20)	Stage 5 (*n* = 54)	*p* Value
Age	54.53 ± 13.47	51.83 ± 14.87	57.25 ± 10.90	55.07 ± 13.45	0.346
GFR (mL/min/1.73 m^2)	21.01 ± 16.70	44.38 ± 7.81	20.75 ± 3.98	7.68 ± 2.66	<0.05
HB (g/dL)	8.87 ± 2.12	10.35 ± 1.75	9.72 ± 1.90	7.70 ± 1.69	<0.05

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S. Creatinine (mg/dL)	4.99 ± 3.32	1.65 ± 0.29	3.05 ± 0.72	7.63 ± 2.52	<0.05
Sodium (mg/dL)	135.16 ± 6.57	134.25 ± 7.62	136.25 ± 5.29	135.27 ± 6.57	0.567
Total Protein (g/dL)	5.87 ± 1.15	5.19 ± 1.19	5.24 ± 1.12	6.11 ± 0.97	<0.05
Chloride (mg/dL)	100.20 ± 11.29	97.99 ± 18.42	101.00 ± 5.70	101.17 ± 6.51	0.410
Potassium (mg/dL)	4.97 ± 3.76	4.36 ± 0.83	4.70 ± 0.84	5.43 ± 5.16	0.426
Albumin (g/dL)	3.25 ± 0.69	2.98 ± 0.89	3.26 ± 0.67	3.39 ± 0.52	0.030
S. Uric acid (mg/dL)	7.30 ± 7.06	5.58 ± 1.64	8.30 ± 3.53	8.92 ± 9.45	<0.05
S. Urea (mg/dL)	118.17 ± 81.07	57.54 ± 41.06	87.70 ± 39.26	164.26 ± 82.01	<0.05

Diabetes Mellitus (61.9%), hypertension (56.2%), chronic glomerulonephritis (7.6%), chronic pyelonephritis (6.7%), and polycystic kidney disease (5.7%) were identified to be the most frequent complications in this study. Other less-common etiologies include miscellaneous and obstructive uropathy (Figure 1).

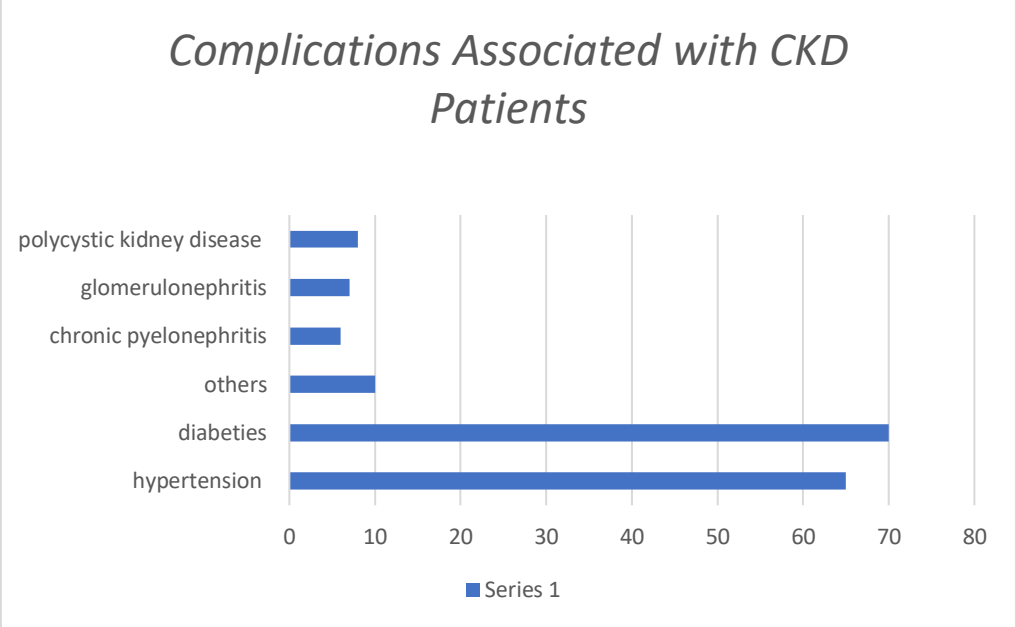

Figure 1. This figure provides a detailed overview of with and without co-morbidities associated with CKD. Both diabetes and hypertension were present in 39.04% of the patients. Whereas, 1.90% of patients also had chronic glomerulonephritis or chronic pyelonephritis in addition to diabetes and hypertension. In 2.85% of patients, obstructive nephron disease and hypertension were related to other etiologies. An unspecified, other, non-identified, and other cause was recorded in 20% of patients. In 6.66% of patients, chronic pyelonephritis, polycystic kidney disease, and chronic glomerulonephritis are associated with hypertension. In 3.80% of patients, chronic pyelonephritis, polycystic kidney disease, and chronic glomerulonephritis were shown to be present with diabetes.

Evaluation of Health-Related Quality of Life in Patients with CKD

The results demonstrated that the HRQoL scores in all dimensions of the scoring manual are progressively impaired. Table 4 shows the HRQoL dimension scores at various CKD stages. Compared to patients in CKD stages 4 and 5, patients in CKD stage 3 (p <0.05) had higher scores across all SF-35domains comprising the physical and mental component summaries. The mean difference for PCS and MCS based on CKD stages was reported to be statistically significant (p < 0.005).

Table 4. HRQOL dimension scores in different stages of CKD.

HRQOL Dimensions	Total (n = 105)	CKD Stage 3 (n = 34)	CKD Stage 4 (n = 20)	CKD Stage 5 (n = 54)	p Value
Symptom problem list	67.10 ± 15.23	88.57 ± 4.12	59.27 ± 6.02	57.71 ± 7.22	<0.005
Effect of kidney disease	44.08 ± 23.85	78.45 ± 4.65	39.99 ± 11.38	25.85 ± 6.96	<0.005
The burden of kidney disease	30.23 ± 19.49	48.80 ± 21.61	45.62 ± 16.61	35.76 ± 12.34	<0.005
Work status	32.38 ± 37.32	59.67 ± 41.67	22.00 ± 25.13	21.29 ± 30.09	<0.005
Cognitive function	49.14 ± 32.85	91.18 ± 9.64	63.00 ± 7.93	19.87 ± 8.03	<0.005
Quality of social	57.20 ± 22.02	87.95 ± 6.79	57.66 ± 6.93	19.87 ± 8.03	<0.005

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interaction					
Sexual function	0.000	0.000	0.000	0.000	<0.005
Sleep	49.97 ± 17.50	72.17 ± 8.84	42.12 ± 3.91	40.13 ± 11.88	<0.005
Social support	75.39 ± 23.12	100.00 ± 0.00	77.50 ± 18.94	71.60 ± 16.06	<0.005
Dialysis staff encouragement	86.07 ± 14.22	91.12 ± 9.23	85.00 ± 0.00	78.00 ± 13.93	<0.005
Overall health	42.76 ± 14.83	60.32 ± 7.06	47.00 ± 7.32	31.11 ± 7.68	<0.005
Patient satisfaction	62.53 ± 16.46	82.79 ± 10.07	58.33 ± 8.55	52.46 ± 9.93	<0.005
Physical functioning	34.85 ± 25.92	72.09 ± 7.82	29.25 ± 9.21	15.55 ± 7.18	<0.005
Role of physical health	16.66 ± 31.52	47.41 ± 43.94	45.00 ± 23.78	0.00 ± 0.00	<0.005
Pain	37.38 ± 34.25	87.01 ± 9.75	32.00 ± 8.41	10.87 ± 7.46	<0.005
General health	32.90 ± 15.28	54.83 ± 5.84	25.75 ± 5.68	22.96 ± 5.09	<0.001
Emotional well-being	38.89 ± 28.25	77.16 ± 6.21	46.80 ± 6.63	14.00 ± 4.23	<0.001
Role of emotional health	31.11 ± 28.22	56.99 ± 15.38	53.33 ± 16.75	8.02 ± 14.38	<0.001
Social functioning	35.83 ± 32.98	79.83 ± 8.34	44.37 ± 10.31	7.40 ± 8.59	<0.001
Energy fatigue	37.57 ± 7.30	43.38 ± 5.68	40.00 ± 6.99	32.96 ± 4.80	<0.001
sf12 physical composite	31.77 ± 8.40	42.02 ± 6.45	32.05 ± 4.70	25.78 ± 3.02	<0.001
sf2 mental composite	35.40 ± 10.89	47.94 ± 3.59	40.24 ± 4.63	25.70 ± 4.63	<0.00

The current study also demonstrated that the HRQoL score domains such as symptom problem list, the effect of kidney disease, and the burden of kidney disease decline significantly and progressively as the patient advances into higher stages of CKD ($p < 0.005$). A similar pattern was observed in work status, sleep, and general health ($p < 0.005$).

A logistic regression was performed to ascertain the effects of PCS, and MCS on the CKD-associated disorders including diabetes and hypertension. The model successfully identified 62.9% of cases with CKD-associated diabetes and explained 10.0% (Nagelkerke R2) of the variation in those cases. Increasing PCS ($\beta = -0.038$; $p = 0.240$) and MCS ($\beta = -0.032$; $p = 0.203$) was associated with decrease in CKD associated diabetes; however, the results were not statistically significant. In case of CKD-associated hypertension, the model explained 22.5% (Nagelkerke R2) of the variance and correctly classified 70.5% of cases. Increasing PCS ($\beta = -0.031$; $p = 0.353$) and MCS ($\beta = -0.068$; $p = 0.011$) were associated with decrease in CKD-associated diabetes; however, only MCS showed a statistically significant association.

Discussion

Health-related quality of life is a constantly increasingly relevant measure in assessing the effectiveness of chronic illness therapy, particularly in patients with advanced CKD. Patients' subjective assessments of the disease play a critical role in determining medical decisions that take into account their physical, social, and emotional requirements. Various factors contribute to this decline in HRQoL, including inadequate nutrition, anemia, cognitive impairment, depression, sleep disorders, apathy, reduced physical and sexual functioning, and co-morbidities such as diabetes, hypertension, and cardiovascular diseases. Until now, HRQoL has only been considered as a consequence of an individual's illness. However, HRQoL is gaining significance as a patient-centered measure and is acknowledged as a health system indicator. Despite this knowledge, little is currently understood about how kidney disease specifically impacts HRQoL and whether HRQoL predictors can be targeted for potential interventions.[14] In this study, we have investigated health-related quality of life, and evaluated factors that might be contributing to declining QoL in patients with CKD at a public teaching hospital. According to the study's findings, CKD patients had a clinically significant decline in HRQoL, with a progressive worsening of HRQoL dimensions as the patient progressed to ESRD. This study also showed that, even in the initial stages of the disease, CKD imposes a number of limitations on patients' day-to-day lives, particularly in terms of their physical and mental functionality. These findings were supported by Pei et al., who also highlighted that HRQoL is significantly diminished in CKD patients, and this decline serves as a predictor of future mortality .[15]

The results also highlighted that a strong association was observed for the variables such as CKD stages, age, sex, hyperuricemia, and anemia with HRQoL ratings. Factors such as GFR, serum creatinine, total protein, hemoglobin levels, were discovered to have a statistically significant difference on HRQoL ratings based on CKD stages. Numerous studies reported that clinical and demographic variables including age , gender , concomitant conditions such as diabetes , anemia , and residual renal function all have an impact on HRQoL.[16]

Anemia is quite common in CKD patients and is linked to poor clinical outcomes . In the current study, anemia was associated with a worsening of HRQoL measures. These findings were corroborated by Finkelstein et al., who also noted that anemia in CKS patients is linked to a lower quality of life in terms of health (HRQoL) . Furthermore, numerous studies have demonstrated that erythropoietin-stimulating

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agent (ESA) therapy for anemia in CKD improves quality of life in terms of health .[17]

HRQoL is significantly impacted by CKD, with the physical domains presenting the greatest challenges. This study also evaluated the HRQoL domains based on CKD stages.

In the present study, the physical composite summary had shown a positive correlation with GFR and Hb, while a negative correlation was observed for creatinine, sodium, total protein, chloride, potassium, albumin, uric acid, and urea. However, the mental composite summary reported a positive correlation with GFR and hemoglobin and a negative correlation was identified with serum creatinine, total protein, albumin, and urea. This was supported by the findings reported by Pagels et al. and Aggarwal et al. [1,2] Additionally, the results showed that increasing PCS and MCS values are related to a decline in CKD-associated disorders; however, the findings were not statistically significant. The small sample size could be the cause.

In addition to this, HRQoL scores deteriorated gradually and significantly as eGFR dropped, with CKD stage 5 showing the most severe impairment. This suggests a link between declining kidney function (as determined by eGFR) and deteriorating HRQoL across all parameters. The physical composite summary scores were more deteriorated than mental composite summary scores but both had a significant difference. These findings were in consonance with the results reported by Aggarwal et al. [1,2]

Diabetes Mellitus (61.9%), hypertension (56.2%), chronic glomerulonephritis (7.6%), chronic pyelonephritis (6.7%), and polycystic kidney disease (5.7%) were identified to be the most frequent complications in this study. Other less-common etiologies include miscellaneous and obstructive uropathy. It is simple to overlook the reality that for patients, maintaining their mental health and being satisfied with their care are equally if not more critical than achieving clinical or quantitative laboratory targets. Here, we found that patients with CKD, particularly those in the final stages of the disease, had decreased HRQoL, a critical predictor of patient-centered outcomes, proving that quality of life is significant for both positive and negative outcomes for these patients.[18,19]

Limitations of the study: The study's cross-sectional design precluded a follow-up, which would have allowed for a better design for detecting the worse quality of life and underlying causes. Additionally, due to the data's quantitative structure, the causes for the patients' poor quality of life could not be adequately highlighted.[20] These reasons could have been better understood by conducting in-depth interviews or focus groups. Furthermore, as the study concentrated only at a single facility and used a smaller sample size, caution should be used when extrapolating the findings.[21]

Conclusions

This study found a significant decline in Health-Related Quality of Life (HRQoL) among chronic kidney disease (CKD) patients, with worsening HRQoL dimensions as the disease progresses to end-stage renal disease. CKD places restrictions on patients' daily lives, particularly in physical and mental functioning, even in the early stages. Patients must actively manage their condition and maintain optimism for improved Quality of Life (QoL). The disease's impact extends to the patients' families, who also require ongoing information and support. Healthcare professionals should be aware of these effects and provide guidance for better daily living. Emphasis should be placed on psychosocial and medical therapies to enhance QoL in CKD patients. Despite limitations including a small sample size and single-center investigation, this study highlights the link between CKD and HRQoL, emphasizing the importance of assessing HRQoL in CKD patients. Timely interventions to improve HRQoL can significantly benefit patient health.

Reference

1. Pagels, A.A.; Söderkvist, B.K.; Medin, C.; Hylander, B.; Heiwe, S. Health-related quality of life in different stages of chronic kidney disease and at initiation of dialysis treatment. *Health Qual. Life Outcomes* **2012**, *10*, 71.
2. Aggarwal, H.K.; Jain, D.; Pawar, S.; Yadav, R.K. Health-related quality of life in different stages of chronic kidney disease. *QJM* **2016**, *109*, 711–716.
3. Hill NR, Fatoba ST, Oke JL, Hirst JA, O'Callaghan CA, Lasserson DS, et al. Global Prevalence of Chronic Kidney Disease–A Systematic Review and Meta-Analysis. *PLoS One*. 2016;11(7):e0158765. pmid:27383068
4. KDIGO clinical practice guideline for the diagnosis, evaluation, prevention, and treatment of Chronic Kidney Disease-Mineral and Bone Disorder (CKD-MBD). *Kidney IntSuppl*, 2009(113): p. S1–130. pmid:19644521
5. Bayoumi M, Al Harbi A, Al Suwaida A, Al Ghonaim M, Al Wakeel J, Mishkiry A. Predictors of quality of life in hemodialysis patients. *Saudi J Kidney Dis Transpl*, 2013. 24(2): p. 254–9. pmid:23538347
6. Jha V., Wang A.Y.-M., and Wang H. The impact of CKD identification in large countries: the burden of illness. *Nephrol Dial Transplant*. 2012. 27(suppl 3): p. iii32–iii38.
7. Bohlke M, Nunes DL, Marini SS, Kitamura C, Andrade M, Von-Gysel MPO. Predictors of quality of life among patients on dialysis in southern Brazil. *Sao Paulo Med J*. 2008;126(5):252–6. pmid:19099157
8. Kalantar-Zadeh K. and Unruh M. Health related quality of life in patients with chronic kidney disease. *IntUrolNephrol*. 2005. 37(2): p. 367–378. pmid:16142573
9. Moura A, Madureira J, Alija P, Fernandes J, Oliveira J, Lopez M, et al. Predictors of health-related quality of life perceived by end-stage renal disease patients under online hemodiafiltration. *Quality of Life Research*. 2015. 24(6): p. 1327–1335. pmid:25381124

DOI: 10.69605/ijlbpr_14.3.2025.129

10. Baiardi F, Degli EE, Cocchi R, Fabbri A, Sturani A, Valpiani G, et al. Effects of clinical and individual variables on quality of life in chronic renal failure patients. *Journal of Nephrology*, 2002. 15(1): p. 61–67. pmid:11936428
11. Awuah KT, Finkelstein SH, Finkelstein FO. Quality of life of chronic kidney disease patients in developing countries. *Kidney Int Suppl*. 2013;3(2):227.
12. Ayanda KA. and Ajiboye OAAPO. Quality of Life of Chronic Kidney Disease Patients in a Nigerian Teaching Hospital. *JBAH*, 2014; 4(5):17–28.
13. MahboobLessan P, Zohreh R. Contributing factors in health-related quality of life assessment of ESRD patients: a single center study. Nephro-urology Monthly. *Int J Nephrol Urol*. 2009;1(2):129–36.
14. Magacho EJ, Ribeiro LC, Chaoubah A, Bastos MG. Adherence to drug therapy in kidney disease. *Braz J Med Biol Res*. 2011;44(3):258–62. pmid:21344138
15. Cruz MC, Andrade C, Urrutia M, Draibe S, Nogueira-Martins LA, SessoRde C. Quality of life in patients with chronic kidney disease. *Clinics*. 2011;66(6):991–5. pmid:21808864
16. Kimmel PL and Patel SS. Quality of life in patients with chronic kidney disease: focus on end-stage renal disease treated with hemodialysis. *Semin Nephrol*. 2006 26(1):68–79. pmid:16412831
17. Fiseha T, Kassim M, Yemane T. Prevalence of chronic kidney disease and associated risk factors among diabetic patients in southern Ethiopia. *Am J Health Res*. 2014;2(4):216–21.
18. DiMatteo MR. Variations in patients' adherence to medical recommendations: a quantitative review of 50 years of research. *Medical care*. 2004;42(3):200–9. pmid:15076819
19. Pourhoseingholi MA, Vahedi M, Rahimzadeh M. Sample size calculation in medical studies. *Gastroenterol Hepatol Bed Bench*. 2013;6(1):14. pmid:24834239
20. Kebede D, Alem A, Shibre T, Negash A, Deyassa N, Beyero T. Health related quality of life (SF-36) survey in Butajira, rural Ethiopia: normative data and evaluation of reliability and validity. *Ethiop Med J*. 2004;42(4):289–97. pmid:16122121
21. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Med care*. 1992; 30(6): 473–83. pmid:1593914