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Original Article

Assessment of Health-Related Quality of Life in Chronic Kidney Disease Patients

Panga Gayathri[1], Mehdi Alom Chowdhury[1], Umesh Rathod[1], Guntru Sangeetha Roy[1,*], M. Chinnaeswaraiah[2]

[1]Department of Pharmacy Practice, Anurag Pharmacy College (Affiliated to Jawaharlal Nehru Technological University, Hyderabad), Ananthagiri, Kodad, Suryapeta, Telangana, INDIA.
[2]Department of Pharmacognosy, Anurag Pharmacy College (Affiliated to Jawaharlal Nehru Technological University, Hyderabad), Ananthagiri, Kodad, Suryapeta, Telangana, INDIA.

ABSTRACT

Background: Chronic Kidney Disease (CKD) is a long-term condition that affects patients' physical, mental, and social well-being. As the disease progresses, symptoms and treatment demands can lower Health-Related Quality of Life (HRQOL). Assessing HRQOL helps evaluate disease impact and improve patient-centered care in CKD management. The purpose of the study is to evaluate how Chronic Kidney Disease affects the Health-Related Quality of Life (HRQOL) of patients. **Materials and Methods:** The goal was to gather demographic data, such as domicile, gender, and age. A face-to-face interview was conducted using the SF-36 Questionnaire to measure the HRQOL in CKD patients and establish a cross-sectional relationship between selected factors on HRQOL. **Results:** The results show how CKD steadily degrades quality of life while dialysis together with advanced disease severity makes patients experience worse physical difficulties and stronger emotional distress and reduced social activity. The health status becomes worse when patients have multiple health issues (HTN and DM) together with age characteristics and gender differences and being from a rural setting. The treatment of dialysis restricts patient mobility while it intensifies discomfort and leads to psychological distress. **Conclusion:** The improvement of life quality demands multiple essential interventions including patient-centered care along with holistic care and lifestyle changes and mental health support. The physical, psychological, and social effects of the illness as well as its therapies have an impact on it. The treatment of QoL demands an integrative approach including both life modification along with psychological aid and patient-oriented treatment methods and medical intervention strategies.

Keywords: Demographic data, Quality of life, Chronic kidney disease, Diabetes, Hypertension.

Correspondence:
Dr. Guntru Sangeetha Roy
Department of Pharmacy Practice, Anurag Pharmacy College (Affiliated to Jawaharlal Nehru Technological University, Hyderabad), Ananthagiri, Kodad, Suryapeta, Telangana, INDIA.
Email: sangeetharoyguntru@gmail.com

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INTRODUCTION

Chronic Kidney Disease (CKD) is an irreversible progressive disease characterized by the long-term decline in renal functioning. Based on the current accepted standards, the disease is officially diagnosed when the estimated Glomerular Filtration Rate (eGFR) is lower than 60 mL/min/1.73 m^2 at least three months continuously or the pathological evidence of kidney damage is reported by means of abnormal indicators in the blood or urine (Yan *et al*., 2021). The disease has several phases, and stage 5 is regarded as end-stage renal disease requiring replacement treatments (either dialysis or kidney transplantation) (Hogg *et al*., 2003). It is important to mention that CKD is quite common with an incidence rate of somewhere around 8-10% of the world population and classified as the eleventh number of deaths worldwide (Jager and Fraser, 2017). The burden is high especially in low and middle-income countries, which compromises screening and treatment due to poor accessibility to special healthcare facilities. The term describing the disease is often referred to as a silent epidemic due to its initial symptoms usually being asymptomatic, which creates major delays in the process of detecting and treating the disease (Priyadarshani *et al*., 2023). Moreover, the patient economic impact is high hence compounding the public-health issue.

Progressive CKD consistently generates various complications ie, anemia, mineral-bone disorder, hypertension, and fluid retention, all of which cause decreased Health-Related Quality of Life (HRQOL). The patients struggle with the problems of symptomatology like fatigue, physical limitations, complications of dialysis, and increased reliance on caregivers that severely interfere with the social and emotional well-being of the patients. Moreover, economic burden and shame often intensify loneliness and complicate personal relationships. With these complexities, our current study aims to assess the HRQOL of patients with

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CKD and to determine the major predictors of the quality-of-life scores.

MATERIALS AND METHODS

Our study was a cross-sectional and descriptive study using Health-Related Quality of Life (HRQOL) in patients with Chronic Kidney Disease (CKD). The data was gathered within the period of [August, 2024] and [April, 2025] in various tertiary care hospitals, dialysis centers and dedicated nephrology and urology clinics.

Study Population

Adults of 18 years and above who had been diagnosed with CKD at any level as well as those under dialysis, hemodialysis, or peritoneal dialysis or under medical management are eligible to participate. Informed consent was obtained from all the patient before enrolling in the study which contains full description of the purpose and plan of the study.

Exclusion criteria encompassed

Patients with severe cognitive impairment or a debilitating mental illness, pregnant women, patients with a critical illness necessitating intensive care, poor data, and those who declined participation were not subjects of the study and served as exclusion criteria.

Sample size and Sampling procedure

An expected sample size was determined based on evidence provided by prior studies into the HRQOL in CKD patient groups so that the results had sufficient statistical power to elicit clinically significant differences. The selection bias was minimized by using a random sampling strategy and recruiting the patients of nephrology outpatient clinics and dialysis facilities.

Data Collection Measures and Variables

HRQOL was assessed using the Short Form Health Survey (SF-36) which is a validated and multidimensional questionnaire that takes into consideration eight domains of health issues. Besides, sociodemographic and clinical information was gathered using a structured questionnaire.

- Age, gender, Residence, marital status.
- Clinical factors: CKD stage, disease duration, comorbidities (especially diabetes and hypertension), dialysis type (in case available).
- Lifestyle: Food habits, exercise, tobacco, and alcohol forms of degradation in lifestyle.
- Whenever possible, the questionnaires were given to the patients by face-to face interviews adopting local language of the interviewees.

Ethical Considerations

The Institutional Ethics Committee (IEC) of granted ethical clearance (Approval No.:ANRP/2024/02). The process was purely voluntary with the ability to withdraw at any moment without making any impact to medical treatment. Excessive levels of data confidentiality were ensured through de-identification of all responses, and storage of datasets.

Statistical Analysis and Data Management

Data completion was done after checking the completed questionnaires. Data were entered into excel sheets and the Statistical analyses done using GraphPad Prism version 10 (GraphPad Software, USA). Continuous variables were summarized by descriptive statistics (means, standard deviations), whereas categorical variables were presented as frequency and percentages whereas Comparisons between groups used a proper parametric statistics (ANOVA). The criterion used to decide statistically significant was $p<0.05$.

RESULTS

In our current study we recruited 342 participants who had Chronic Kidney Disease (CKD). There was a preponderance of males (n=249, 72.8%) among the overall sample with females (n=93, 27.2%) forming the residual. The age pattern showed that the prevalence of the disease increased gradually with increasing age, and reached a peak among those aged 51-70 years and began deteriorating in the subsequent age groups.

Differences in Quality of Life (QOL) According to Age

The scores of HRQOL decreased steadily with the increase in age, and people over the age of 60 years scored the lowest among all age groups and the youngest group of 16 to 30 years scored the highest (ANOVA: $p<0.0001$) (Table 1).

Gender-Specific Findings

The domain-by-domain analysis of gender provided young with better emotional well-being and social functioning in women. Men, on the contrary, were much better in the physical functioning scores ($p<0.0001$ across domains).

Quality of Life and Marital Status

Out of the respondents, 320 were married and 22 were not married. Among unmarried persons and married respondents, higher total QOL scores were reported by the former group (p= 0.0387).

Urban Rural Residence and Quality of Life

Comprising urban (n=33) and rural residents (n=309), they compared higher scores on most domains of QOL except General Health. The differences were statistically significant ($p<0.0001$),

which allowed discussing the disparities that might be related to the accessibility of healthcare services and living conditions.

Quality of Life and Dietary Pattern

Most (n=279) of them had mixed diet, but 63 were vegetarians. Individuals with a mixed diet achieved much better results on physical, mental, and social aspects of health (p<0.0001) (Table 2).

Anthropometric Parameters

Out of the current 343 sample individuals, the number of individuals who had a weight within the range of 51-70 kg was 175 (51.17%). Malnutrition markers were present in a substantive subset, and they encompassed 90 (26.32%) participants. The occurrence of obesity on the other hand was quite rare with only 13 (3.80%) cases taken. HRQOL variations by weight category were near statistical significance (p=0.0003). Both underweight and obese participants also recorded lower HRQOL compared to their counterparts, the trend continued after they were stratified by comorbidity.

Lifestyle Behaviours

Shifting to the field of lifestyle behaviours, 174 members had no record of alcohol, tobacco and/or chewing habits. Among the rest of the population, 152 drank alcohol, 60 were smoking and 21 chew tobacco. It was revealed that the most common first-order ethnographic finding was swelling in lower extremities (n=230), followed by dyspnea (n=163) and generalized pain in the whole body, decreased urine output, cough, abdominal pain, headache, constipation, light-headedness, vomiting, and a set of other complaints.

Comorbidities

The set of comorbidities was heterogeneous. Hypertension (n=314, 91.30%) became the most dominant condition and then diabetes mellitus (n=119, 34.60%). Other diagnoses such as thyroid disorders (n=12, 3.50%), tuberculosis (n=4, 1.16%), heart failure (n=3, 0.87%) were found, and less common pathologies like anemia, stroke, asthma, and retinopathy belonged to rare diagnoses. Fourteen people (3.84%) said that they had never experienced chronic illnesses in the past.

Clinical Characteristics and Disease Staging

Clinical characterization and disease staging showed that 268 subjects (90.40 percent) were diagnosed with stage 5 CKD (GFR 110 mL/min), and stage 4 (n=53) and stage 3b, as well as earlier stages, were less common. There was edema in 253 people, a tendency appropriate to significantly advanced illness and/or fluid overload. The duration of the disease was variable, as 40 of them did so 5-10 years ago, and only 10 with more than 10 years of CKD experience. Greater time was associated with worsened Physical Functionality (PF), Emotional Well-Being (EWB), and Social Functioning (SF). The severity of pain among the participants was highest when the disease duration was 16-20 years (p<0.0001) (Table 3).

Treatment Factors

In the current study, a set of clinical factors was pre-measured, and their impact on the state of Health-Related Quality of Life

Table 1: Mean Scores of demographic factors influencing HRQOL in CKD patients.

Age	NO.	%	PF (Mean±SD)	RL P (Mean±SD)	RLE (Mean±SD	E/F (Mean±SD	EWB (Mean±SD)	SF (Mean±SD	PAIN (Mean±SD)	GH (Mean±SD)	ANOVA p-value
16-30	25	7.30	32.00±15.55	5.00±16.14	8.00±24.11	28.20±16.64	26.56±15.44	32.00±20.12	37.80±23.47	43.73±13.99	<0.0001
31-40	46	13.45	20.67±14.98	0.00± 0.00	0.00±0.00	17.00±9.56	19.82±6.66	19.72±13.45	27.50±20.94	37.31±6.78	
41-50	83	24.26	14.82±12.58	0.00±0.00	0.00±0.00	15.72±9.66	17.25±7.20	20.45±13.88	20.99±19.24	34.34±6.69	
51-60	85	24.85	14.71±16.84	0.00±0.00	0.00	16.06±10.89	20.35±11.40	19.41±13.98	20.00±20.02	34.80±6.67	
61-70	74	21.63	8.33±13.08	0.51±4.36	0.00	15.34±10.01	16.70±6.70	16.89±12.32	14.26±16.08	33.45±4.63	
>70	29	8.47	11.21±	0.00±12.93	0.00±0	15.69±0	15.59±9.42	16.81±9.93	15.09±16.46	32.96±4.98	
Gender											
Male	249	72.80	13.87±15.31	0.00±0.00	0.00±0.00	16.18±11.33	19.05±8.97	20.97±13.81	19.33±19.47	35.41±	<0.0001
Female	93	27.19	15.65±15.64	0.65±5.74	0.80±7.88	17.15±11.10	18.69±9.86	19.57±15.80	21.55±20.26	35.12±	
Marital Status											
Married	320	93.56	13.91±14.83	0.12±2.10	0.00±0.00	15.92±10.11	18.12±8.68	19.09±13.74	19.64±19.16	34.44±6.10	< 0.0387
Unmarried	22	6.43	33.41±14.59	5.68±17.13	9.09±25.58	30.91±15.78	28.55±15.87	32.39±22.05	39.89±23.31	46.21±14.08	
Residence											
Rural	309	90.35	21.82±22.46	0.76±4.35	1.01±5.80	18.48±14.06	21.58±13.71	23.48±18.95	27.58±22.14	35.35±10.11	<0.0001
Urban	33	9.64	14.45±14.49	0.44±4.97	0.54±6.83	16.72±10.82	18.49±9.05	19.57±14.21	20.23±19.71	35.18±7.12	

Table 2: Mean score of Diet and weight influencing HRQOL in CKD patients.

Diet	NO.	%	PF (Mean±SD)	RL P (Mean±SD)	RLE (Mean±SD	E/F (Mean±SD	EWB (Mean±SD)	SF (Mean±SD	PAIN (Mean±SD)	GH (Mean±SD)	ANOVA *p*-value
Veg	63	18.42	12.94±14.88	0.40±3.15	0.53±4.20	15.24±11.93	17.27±10.68	15.67±13.83	14.76±20.28	34.88±8.23	<0.0001
Both	279	81.57	15.67±15.67	0.49±5.22	0.60±7.18	17.26±10.97	19.13±9.35	20.91±14.79	22.34±19.76	35.27±7.27	
Weight											
31-40	19	5.55	14.74±19.04	1.32±5.74	3.51±15.29	16.05±13.90	16.21±7.36	19.74±16.83	19.21±24.12	37.94±14.36	<0.0001
41-50	71	20.76	16.76±17.45	0.35±2.97	0.47±3.96	16.55±13.35	19.94±11.89	21.48±16.39	19.82±20.21	34.70±8.17	
51-60	100	29.23	13.50±12.66	0.00±0.00	0.00±0.00	15.05±10.95	18.36±9.98	19.13±13.93	22.10±19.74	35.22±6.68	
61-70	75	21.92	15.33±17.40	0.00±0.00	0.00±0.00	16.27±9.30	18.51±7.52	20.83±15.83	20.13±19.33	34.91±5.98	
71-80	51	14.91	17.38±15.60	2.21±11.65	1.96±14.00	20.69±9.38	20.12±10.08	19.07±14.42	23.43±21.27	35.29±7.09	
81-90	13	3.80	12.69±9.49	0.00±0.00	0.00±0.00	21.54±10.88	16.00±8.64	16.35±6.00	13.65±16.70	36.22±5.74	
91-100	7	2.04	7.86±8.59	0.00±0.00	0.00±0.00	20.71±8.86	18.29±5.09	25.00±10.21	31.79±17.00	32.14±3.15	
>100	6	1.75	18.33±16.63	0.00±0.00	0.00±0.00	15.00±8.94	19.33±3.01	14.58±5.10	12.50±16.66	36.11±6.80	

Table 3: Mean score of disease related factors influencing HRQOL in CKD patients.

Stage	NO.	%	PF (Mean±SD)	RL P (Mean±SD)	RLE (Mean±SD	E/F (Mean±SD	EWB (Mean±SD)	SF (Mean±SD	PAIN (Mean±SD)	GH (Mean±SD)	ANOVA *p*-value
3	8	2.33	23.13±12.52	0.00±0.00	0.00±0.00	21.88±14.62	26.50±5.63	32.81±16.28	29.38±18.16	33.85±5.19	<0.0001
4	24	7.01	25.83±30.85	1.04±5.10	1.39±6.80	24.38±16.11	24.83±16.39	32.29±21.47	26.67±25.86	35.24±11.97	
5	309	90.35	14.05±13.39	0.44±4.97	0.54±6.83	16.12±10.34	18.04±8.64	18.56±13.38	20.20±19.50	35.22±7.07	
No. of Dialysis											
0 times	15	4.38	30.33±17.88	0.00±0.00	0.00±0.00	28.33±9.39	28.80±7.59	41.67±10.21	39.83±9.33	36.11±4.90	
2 times	115	33.62	15.62±16.87	0.54±4.19	0.58±6.22	17.91±10.78	19.63±10.53	19.24±14.65	20.72±20.75	35.03±7.77	0.0002
3 times	212	61.98	13.84±14.05	0.47±5.42	0.63±7.23	15.52±10.99	17.62±8.89	18.80±13.90	19.73±19.59	35.23±7.43	
No. of Blood Transfusions											
0 to10	336	98.24	15.08±15.61	0.48±4.95	0.60±6.97	16.93±11.18	18.80±9.69	20.01±14.81	20.76±20.00	35.21±7.46	0.0002
11 to20	4	1.169	16.25±11.09	0.00±0.00	0.00±0.00	11.25±11.09	16.00±3.27	12.50±10.21	21.88±20.55	31.25±5.38	
>20	2	0.584	27.50±10.61	0.00±0.00	0.00±0.00	20.00±7.07	22.00±2.83	25.00±0.00	50.00±7.07	41.67±5.89	
Tx Duration											
<5y	292	85.38	15.5±16.09	0.55±5.30	0.68±7.27	16.9±11.51	19.2±9.95	20.7±15.22	21.63±20.33	35.38±7.60	<0.0001
5 to 10	40	11.70	12.62±10.91	0±0	0 ±0	16.12±7.80	15.8±6.77	15.6±10.87	13.87±15.90	34.20 ±6.31	
11 to 15	4	1.17	11.42±9.44	0± 0	0±0	20 ±13.22	16.57±7.80	14.28±11.24	22.14±21.76	35.71 ±7.15	
16 to 20	6	1.75	27.5±31.81	0± 0	0± 0	15±7.07	14±2.82	18.75±8.83	45 ±0	29.16 ±5.89	

(HRQOL) was particularly accentuated. The examination further verifies that frequencies of dialysis have an eminent impact on HRQOL measures. Participants under three-times-weekly dialysis (n 212, 62%) showed the worst HRQOL scores, followed closely by those patients who are no longer on dialysis (p=0.0002).

Blood Transfusion History

Regarding the history of blood transfusions, three-fourths of the patients (n=336) needed minimal transfusion, with four of the patients needing moderate blood replacement. Specifically, the cohort, which underwent transfusion, reflected an improvement of physical functioning and reported a higher level of overall well-being, in a general sense, in comparison with non-recipients (p=0.0002).

DISCUSSION

The empirical study confirms hypertension and diabetes as the core risk predictors of Chronic Kidney Disease (CKD) in adults aged between 51 years and 70 years. The reduced prevalence rates of young adults in comparison (31 years to 40 years) are similar to previous prevalence results due to the raised awareness and wider screening culture. Mahmood *et al.*, (2017) stated that recorded

cases of CKD decrease in individuals aged above 70 years, which is similar to our data.

The startling prevalence of CKD in men should be explained by male or female risk and varied healthcare-seeking patterns. Women usually show improved emotional well-being but they also consistently have supplementary burdens of being caregivers and they are likely to undergo undiagnosed or unconventional manifestations. According to Dhatt and Pley (2021), gender-sensitive healthcare delivery is important in correcting these gaps.

Marital status was a complicated correlation. Marriage was important in offering the logistical and emotional support, which reinforced treatment regimen compliance, but having to be a caregiver added to the psychological burden rate pressure. Alshammari *et al.*, (2021) noted that spousal support may not only improve adherence but also increase stress, which again confirms the importance of multimodal support systems in nonprofessionals. On the other hand, unmarried patients faced more materialized social support deficits, a situation that can worsen financial burden and effective management of the disease.

One such finding is that diagnoses still stage 5 are overrepresented, which speaks to the insidious, asymptomatic development of the disease at the lower stages and subsequent delay in treatment.

Extensive studies like Wouters *et al.*, (2015) remind us that timely detection and proactive treatment of Chronic Kidney Disease (CKD) can prevent its progression into End-Stage Renal Disease (ESRD), thus creating a dire sense of necessity to deploy better screening measures in this group.

Among them, the relation between the type of treatment and Quality of Life (QOL) proved to be interesting. HFD, especially tri-weekly, was associated with sharp downward changes in physical and mental-health levels, and this finding is consistent with that of Fishbane *et al.*, (2015). On the other hand non-dialysis patients had better QOL outcome scores hence the extreme significance of intervening early and implementing disease shaping medications that delay dialysis dependency.

The treatment of anemia yielded positive reports. The use of blood transfusions was minimal since iron therapy and erythropoiesis-stimulating agents were actively used. The approach is in line with Aapro *et al.*, (2019) which advocates immediate intervention of anemia to enhance patient outcomes and reduce healthcare costs.

A healthy body weight was found to be essential in the maximal realisation of CKD-related health. Individuals living in the underweight category frequently showed signs of malnutrition, and overweight patients faced an increased risk of cardiovascular problems. The above tendencies are why personalized interventions and nutritional support are an important part of managing CKD.

Moreover, patients in the rural areas faced very serious obstacles to care, which further emphasized the necessity of new technologies like telemedicine and mobile health clinics. According to Bello *et al.*, (2015) and Jafar *et al.*, (2020), the lack of referral networks, supplementary government resources, as well as targeted public awareness campaigns within the local area, are required to close these gaps and improve the provision of CKD management inneglected parts.

CONCLUSION

In the current study, the longitudinal impact of Chronic Kidney Disease (CKD) on the subjective Quality of Life (QOL) of the patients was analysed and it has been found that there was a gradual decline in physical, emotional, and social dimensions of the quality of life of the subjects with the progress of the disease. Dialysis patients indicated severe constrains on their energy, overall health, emotional well-being, and physical functioning. These deficits were increased by comorbidities like diabetes and hypertension. There were other different barriers affecting older adults and people living in rural areas, and the demographic variables such as age and gender further moderated the QOL scores. Dialysis dependence was linked to reduced mobility and enhanced pain, thus limiting lifestyles and social contacts. The results confirm the need to have early lifestyle management, offer emotional support, and integrate a holistic healthcare plan, which encompasses social, psychological, and medical dimensions to promote the health and happiness of CKD sufferers.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

CK: Chronic kidney Disease; **PF-** Physical Functioning; **RL P:** Role limitations Physical; **RLE:** Role limitations Emotional; **SF:** Social Functioning; **E/F:** Energy/Fatigue, **GH:** General health; **EWB:** Emotional well-being; **PF:** Physical functioning; **HQRL:** Health-related quality of life; **ANOVA:** Analysis of Variance; **GFR:** Glomerular Filtration rate.

ETHICAL STATEMENT

This study was a questionnaire-based methodology, and does not involve collection of blood samples. The study was initiated after taking the approval from Institutional review committee. Informed consent was obtained from all participants prior to their involvement.

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