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## **Exploring the Quality of Life of Chronic Kidney Disease Patients Undergoing Hemodialysis: A Preliminary Investigation at Selected Hospitals**

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*doi: 10.33472/AFJBS.6.Si3.2024.6529-6539***ABSTRACT:**

**Background:** Chronic kidney disease (CKD) is a major global health burden affecting millions of people worldwide. Among CKD treatments, hemodialysis is a cornerstone treatment that provides lifelong kidney replacement for patients with end-stage renal disease (ESRD). However, the effect of hemodialysis on the quality of life (QoL) of patients with CKD is of great interest and concern to health professionals and researchers. **Objective:** This cross-sectional analytical study aimed to investigate multifaceted aspects of the quality of life experienced by hemodialysis patients with chronic diseases. **Methodology:** A cross-sectional analytical study was conducted among 100 patients undergoing hemodialysis who were selected using a simple random sampling technique after eligibility screening. Chronic kidney disease clients undergoing regular hemodialysis and free from critically ill patients were included in the study. The data have been collected using a demographic profile, clinical characteristics profile, and kidney disease quality of life instrument KDQOL scale to assess the quality of life. Data analysis was done by calculating the frequency and percentages of demographic profiles and clinical characteristics and for association Chi-Square test was used.

**Results:** The analysis showed that, regarding age distribution, a maximum of 53% of participants fall within the range of 38 to 47 years, and 61% are from the male gender category. In view of the clinical profiles hypertension was notably higher among dialysis patients as a comorbid illness. Furthermore of the dialysis patients were receiving dialysis twice a week. In the blood lab clinical profile report data, a maximum of 39 % of patients were having issues with low hemoglobin levels between 6 – 8.5 g/dl along with this it was also noticed that serum urea levels show a clear majority in the range of 20.5 - 24 mg/dl (82%), Finally, body mass index (BMI) reveals 58% of participants categorized as obese. From the perspective of Quality of Life. The mean calculated value of quality of life mean is 33.3, indicating the average quality of life score across the study participants. Additionally, the standard deviation is reported as 4.085, reflecting the degree of variability or dispersion in the quality-of-life scores among the dialysis patients. A significant association was observed between gender and quality of life and

Notably, a significant association was likewise found between serum sodium levels and quality of life (chi-square value 4.273, p-value 0.039\*). **Conclusion:** The study has provided valuable insights into the quality of life (QoL) of chronic kidney disease (CKD) patients undergoing hemodialysis. Through a comprehensive exploration of various dimensions such as physical functioning as well clinical profile, and emotional well-being.

**Keywords:** Chronic kidney disease (CKD), Quality of life, Clinical profile, Hemodialysis, patients

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## 1. Introduction

Chronic kidney disease (CKD) and its treatments, such as hemodialysis, have an impact on patients' lifestyles and health. "Quality of life" is a complicated and multidimensional notion that encompasses both subjective and objective components. Quality of life is frequently viewed as a precise definition of life satisfaction, social and familial health, hope, rules, and mental health.<sup>1</sup> Clinical trials have proven that quality of life may be used to assess the quality of healthcare services and is included in patients' treatment plans. As a result, assessing quality of life, particularly for chronic conditions, can be an effective tool for improving healthcare quality.<sup>2</sup>

The prevalence of CKD in India is quickly increasing globally. At the end of 2004, 1,78,3000 individuals worldwide were receiving treatment for ESKD, with 77% on dialysis and 23% having a functioning renal transplant (RT), and this figure is increasing at a 7% annual pace. If the current trend continues, the global ESRD population will approach two million by 2010.<sup>3</sup> Individuals diagnosed with Chronic Kidney Disease (CKD) usually develop psychiatric complications as the dialysis procedure causes changes in their physical health and social life.<sup>4</sup> Chronic kidney disease causes catastrophic medical, social, and economic consequences for individuals and their families. Chronic kidney disease affects around 10% of the global population. Over 2 million people received dialysis and kidney transplants to stay alive.<sup>5</sup>

## 2. Materials and Methods:

A cross-sectional analytical study was carried out on 100 patients receiving hemodialysis who had been selected using a simple random sampling procedure completing eligibility screening. The study comprised chronic renal disease patients who received hemodialysis on a regular basis and were not critically ill. The data was gathered using a demographic profile that included characteristics such as age, gender, marital status, educational qualification, occupation, family type, family income, place of residence, distance from the hospital, and availability of health insurance. Clinical criteria include the frequency of dialysis each week, concomitant illnesses, physical activity, and blood test results. The KDQOL scale is used to assess the quality of life of individuals with kidney disease.<sup>6</sup> Data analysis included figuring out the frequency and percentages of demographic profiles and clinical characteristics and also applying the Chi-Square test for association.

## 3. Results:

Table 1 shows the demographic characteristics of chronic renal disease patients receiving hemodialysis at the chosen hospital. In terms of age distribution, 53% of participants are between the ages of 38 and 47, with lesser percentages in the younger and older groups. The gender breakdown shows a largely male group (61% of the study participants). Marital status suggests that 92% of people are married, while 8% are single. Educational attainment varies, with a significant 56% illiterate, 37% finishing primary education, and lesser amounts obtaining higher levels. Occupation diversity is remarkable, with 33% working in the private sector and 31% identifying as agriculturalists. Family arrangements are predominantly made up of nuclear (51%) and joint (43%) families, with only 6% being extended families. The majority of participants (61% of the total) fall into Class II, whereas 57% live in rural areas. The distance to the hospital differs with 39% living 15 kilometres away, while health insurance is mainly offered through work insurance (68%). This complete demographic profile offers the groundwork to comprehend the study population and its potential effect on quality of life in the context of hemodialysis, as can be checked in Table 1.

Table 1: Findings about the Demographic Data of Patients Undergoing Hemodialysis  
n=100

<b>Demographic Variable</b>	<b>Frequency (F)</b>	<b>Percentage (%)</b>
<b>Age in years</b>		
a) Above 18 to 27	2	2%
b) 28 to 37	17	17%
c) 38 to 47	53	53%
d) 48 to 57	28	28%
<b>Gender</b>		
a) Male	61	61%
b) Female	39	39%
<b>Marital status</b>		
a) Married	92	92%
b) Unmarried	8	8%
<b>Educational qualification</b>		
a) Illiterate	56	56%
b) Primary education	37	37%
c) Higher secondary education	0	0%
d) Graduate	3	3%
e) Postgraduate	4	4%
<b>Occupation</b>		
a) Housewife	23	23%
b) Daily wages	5	5%
c) Private Employee	33	33%
d) Govt. Employee	7	7%
e) Business	1	1%
f) Agriculturist	31	31%
<b>Type of family</b>		
a) Nuclear	51	51%
b) Joint	43	43%
c) Extended	6	6%
<b>Income</b>		
a) Class I (Rs. 10,000 and above)	39	39%
b) Class II (Rs. 5000 – Rs.9999)	61	61%
<b>Place of residence</b>		
a) Rural	57	57%
b) Semi-urban	39	39%
c) Urban	4	4%
<b>Distance from hospital</b>		
a) 5 Km	3	3%
b) 10 Km	34	34%
c) 15 Km	39	39%
d) More than 15 Km	24	24%
<b>Health Insurance</b>		
a) Employee Insurance	68	68%
b) Self	32	32%

Table 2 summarizes the clinical characteristics of chronic renal disease patients undergoing hemodialysis, providing information on numerous health indices and conditions. The prevalence of co-morbid conditions is described, with 10% for heart disease and diabetes, whereas hypertension is significantly higher at 65%. Furthermore, 15% of patients have diabetes and hypertension simultaneously. In terms of dialysis frequency per week, the majority (85%) have twice-weekly sessions, with 15% opting for three-weekly sessions. Physical activity levels are very evenly divided, with 49% taking part in moderate activity and an equal amount remaining inactive. Hemoglobin levels are separated into two categories, with 39% ranging between 6 and 8.5 g/dl and 61% exceeding 9 g/dl. Serum creatinine values include 10% with a range of 2 to 4 mg/dl, 74% with 5 to 8 mg/dl, and 16% with 9 to 12 mg/dl. Serum urea levels are highest in the range of 20.5 - 24 mg/dl (82%), but serum sodium levels are distributed as 57% in the range of 129 - 138 mmol/L and 43% in the range of 139 - 148 mmol/L. Serum potassium levels vary equally across the groups of 4.5 - 5 mmol/L (57%) and 5.5 - 6 mmol/L (43%). Serum phosphorus levels vary, with 13%, 46%, 38%, and 3% falling into each of the following categories: 1 - 1.5 mg/dl, 2 - 3 mg/dl, 3.5 - 4.5 mg/dl, and 5 - 5.5 mg/dl. GFR varies between 60 to 80 mL/min/1.73 m<sup>2</sup> (100%). Finally, body mass index (BMI) reveals that 58% of participants are obese, 42% have a normal BMI, and none are underweight. This detailed clinical profile provides insight into the health state of the study population undergoing hemodialysis.

Table- 2 Frequency Distribution of participants as per clinical characteristics of participants.  
n=100

Clinical Characteristics	Frequency (F)	Percentage (%)
<b>Co-morbid illness</b>		
a) Cardiac disease	10	10%
b) Diabetes	10	10%
c) Hypertension	65	65%
d) Diabetes and hypertension	15	15%
<b>Frequency of dialysis per week</b>		
a) Once in a week	0	0%
b) Twice in a week	85	85%
c) Thrice in a week	15	15%
<b>Physical activity</b>		
a) Moderate	49	49%
b) Sedentary	51	51%
<b>Hemoglobin level (g/dl)</b>		
a) 6 – 8.5	39	39%
b) Above 9	61	61%
<b>Serum creatinine (mg/dl)</b>		
a) 2 - 4	10	10%
b) 5 - 8	74	74%
c) 9 – 12	16	16%
<b>Serum Urea (mg/dl)</b>		
a) 13.5 – 17		
b) 17.5 – 20	18	18%
c) 20.5 - 24	82	82%
<b>Serum Sodium (mmol/L)</b>		
a) 129 – 138	57	57%

b) 139 – 148	43	43%
c) 149 – 158 and above		
<b>Serum Potassium (mmol/L)</b>		
a) 3.5 – 4	0	0%
b) 4.5 – 5	57	57%
c) 5.5 - 6	43	43%
<b>Serum Phosphorus (mg/dl)</b>		
a) 1 – 1.5	13	13%
b) 2 – 3	46	46%
c) 3.5 – 4.5	38	38%
d) 5 – 5.5	3	3%
<b>Glomerular filtration rate (mL/min/1.73 m2.)</b>		
a) 60 - 80	100	100%
b) 81 - 100	0	0%
<b>Body mass index (BMI)</b>		
a) Under Weight		
b) Obese	58	58%
c) Normal	42	42%

Table 3 Observations on the quality of life in chronic renal disease patients undergoing hemodialysis.

n=100

	<b>Good Quality of life</b>	<b>Average Quality of life</b>	<b>Poor Quality of life</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>Quality of Life</b>	28	39	33	33.3	4.496

Table 3 exhibits the summary statistics for the variable "Quality of Life" in the context of a research study emphasizing chronic renal disease patients receiving hemodialysis. The mean value is calculated to be 33.3, which is the average quality of life score among study participants. In addition, the standard deviation is stated as 4.496, indicating the degree of variability or dispersion in the quality-of-life ratings.

Table 4- Findings related to the association of the demographic variables with the score of quality of life

n= 100

<b>Demographic Variable</b>	<b>F</b>	<b>Quality of Life</b>		<b>df</b>	<b>Chi-Square Value</b>	<b>p-value</b>
		<b>Good</b>	<b>Fair</b>			
<b>Age in years</b>						
Above 18 to 27	2	1	1	3	6.819	0.078
28 to 37	17	14	3			
38 to 47	53	29	24			
48 to 57	28	12	16			
<b>Gender</b>						
Male	61	39	22	1	3.996	0.046*
Female	39	17	22			

<b>Marital status</b>						
Married	92	49	43	1	3.502	0.061
Unmarried	8	7	1			
<b>Educational qualification</b>						
Illiterate	56	33	23	3	4.080	0.253
Primary education	37	21	16			
Higher secondary education	0	0	0			
Graduate	3	0	3			
Postgraduate	4	2	2			
<b>Occupation</b>						
Housewife	23	10	13	5	7.620	0.178
Daily wages	5	4	1			
Private Employee	33	22	11			
Govt. Employee	7	2	5			
Business	1	0	1			
Agriculturist	31	18	13			
<b>Type of family</b>						
Nuclear	51	25	26	2	2.547	0.280
Joint	43	28	15			
Extended	6	3	6			
<b>Income</b>						
Class I (Rs. 10,000 and above)	39	22	17	1	0.004	0.947
Class II (Rs. 5000 – Rs.9999)	61	34	27			
<b>Place of residence</b>						
Rural	57	33	24	2	4.065	0.131
Semi-urban	39	19	20			
Urban	4	4	0			
<b>Distance from hospital</b>						
5 Km	3	2	1	3	4.034	0.258
10 Km	34	22	12			
15 Km	39	17	22			
More than 15 Km	24	15	9			
<b>Health Insurance</b>						
Employee Insurance	68	38	30	1	0.001	0.972
Self	32	18	14			

Table 4 shows the results of a Chi-Square analysis that looked at the relationship between demographic characteristics and the quality of life of chronic renal disease patients having hemodialysis at a specific hospital. The study's goal was to measure and determine the quality of life based on socio-demographic characteristics. The results suggest a strong link between gender and quality of life, with a chi-square value of 3.996 and a p-value of 0.046. There were no significant connections found for age, marital status, educational qualification, occupation, type of family, income, site of residence, distance from the hospital, or health insurance. The p-values for these factors ranged from 0.078 to 0.972, which exceeded the significance level of 0.05. These findings provide insights into the impact of particular demographic characteristics on the quality of life of chronic renal disease patients receiving hemodialysis at the chosen hospital.

Table 5 Findings related to the association of the clinical characteristics with the score of quality of life  
n= 100

Clinical Characteristics	F	Quality of Life		df	Chi-Square Value	p-value
		Good	Fair			
<b>Co-morbid illness</b>						
Cardiac disease	10	9	1	3	6.739	0.081
Diabetes	10	7	3			
Hypertension	65	33	32			
Diabetes and hypertension	15	7	8			
<b>Frequency of dialysis per week</b>						
Once in a week	0	0	0	1	0.624	0.430
Twice in a week	85	49	36			
Thrice in a week	15	7	8			
<b>Physical activity</b>						
Moderate	49	31	18	1	2.058	0.151
Sedentary	51	25	26			
<b>Hemoglobin level (g/dl)</b>						
6 – 8.5	39	23	16	1	0.230	0.632
Above 9	61	33	28			
<b>Serum creatinine (mg/dl)</b>						
2 - 4	10	7	3	2	2.500	0.286
5 - 8	74	38	36			
9 – 12	16	11	5			
<b>Serum Urea (mg/dl)</b>						
13.5 – 17	0	0	0	1	2.344	0.126
17.5 – 20	18	13	5			
20.5 - 24	82	43	39			
<b>Serum Sodium (mmol/L)</b>						
129 – 138	57	37	20	1	4.273	0.039*
139 – 148	43	19	24			
149 – 158 and above	0	0	0			
<b>Serum Potassium (mmol/L)</b>						
3.5 – 4	0	0	0	1	0.001	0.974
4.5 – 5	57	32	25			
5.5 - 6	43	24	19			
<b>Serum Phosphorus (mg/dl)</b>						
1 – 1.5	13	8	5	3	1.785	0.618
2 – 3	46	28	18			
3.5 – 4.5	38	19	19			
5 – 5.5	3	1	2			
<b>Glomerular filtration rate (mL/min/1.73 m2.)</b>						
60 - 80	100	56	44			
81 - 100	0	0	0			
<b>Body mass index (BMI)</b>						
Under Weight	0	0	0	1	3.344	0.067

Obese	58	28	30			
Normal	42	28	14			

Table 5 presents the results of a Chi-Square study that looked at the relationship between clinical variables and quality of life in chronic renal disease patients undergoing hemodialysis. The study sought to determine the effect of several clinical conditions on quality of life. Notably, there was a strong correlation between serum sodium levels and quality of life (chi-square value 4.273, p-value 0.039\*). Other clinical parameters, such as co-morbidities, dialysis frequency, physical activity, hemoglobin level, serum creatinine, serum urea, serum potassium, serum phosphorus, glomerular filtration rate, and body mass index, did not show any significant relationships. These findings provide insight into the potential impact of particular clinical parameters on the quality of life of chronic renal disease patients having hemodialysis at the selected hospital.

#### 4. Discussion:

Among the study's main findings, 53% of participants are between the ages of 38 and 47 years, whereas an equivalent randomized controlled trial study conducted in 2019 discovered that the majority of ESRD and dialysis patients were between the ages of 50 and 59 years, had completed primary education (29, 30%), and worked in skilled jobs (44, 40%). The majority of them had diabetes and hypertension (35, 34%), as well as hemoglobin levels of more than 9 g/dl (41,38%) and obesity (48,41%).<sup>[7]</sup>

With regards to the clinical characteristics of serum hemoglobin, serum creatinine, and body mass index –obesity was reported in a higher number of study participants, similarly, research conducted in 9 hemodialysis centers in Egypt identified body mass index (BMI)  $\geq 30$  kg/m<sup>2</sup>, was present in 72.6% of the studied population.<sup>[8]</sup>

The desired target hemoglobin level (10.0-11.5 g/dL) was met by 77.3% of patients, with a maximum of 75.8% of patients reporting blood creatinine levels of 5-8 mg/dL. In the current investigation, 28 patients had an excellent quality of life, 39 had an average quality of life, and 33 had a poor quality of life, with the male gender variable being associated with it. In 2022, a similar analytical survey method with a cross-sectional study was carried out at Lampung University-Abdul Moelok Hospital in Indonesia, and it was found that 84 patients had a good quality of life (67.7%), while 40 (32.3%) reported a poor standard of life.<sup>[9]</sup>

A study on the Quality of Life of End-Stage Renal Disease Patients Undergoing Dialysis in Southern Kerala, India found that males had significantly higher physical domain scores ( $p < 0.03$ ).<sup>[10]</sup> Among the findings, serum sodium level was found to be associated with study participants' quality of life; however, a cross-sectional study conducted at the MMIMSR hospital's in-patient department (IPD) in 2023 indicated a deteriorating quality of life among patients who had lower serum levels of sodium.<sup>[11]</sup>

#### 5. Conclusion

Furthermore, the study addressed the demographic and clinical aspects that influence the quality of life among chronic renal disease patients having hemodialysis at a specific hospital. The demographic profile revealed a diversified population with differences in age, gender, marital status, educational qualifications, occupation, family type, income, location, and distance from the hospital, and health insurance coverage. The clinical characteristics, which included co-morbidities, dialysis frequency, physical activity, hemoglobin levels, and different serum indicators, offered a thorough understanding of the individual's health status. The statistical studies, which included mean quality of life scores and Chi-Square tests, revealed

significant relationships between gender, serum salt levels, and quality of life. However, no significant relationships were discovered for other demographic or clinical characteristics. These findings are useful for healthcare providers, policymakers, and researchers seeking a better understanding of the variables influencing the quality of life in chronic renal disease patients undergoing hemodialysis.

**Limitations:** This study was limited only to patients undergoing hemodialysis therapy.

**Ethics permission:** The study was approved by the Ethics Review Committee (IEC) of PIMS-DU in Loni, Maharashtra.

**Conflict of interest:** The authors declare that they have no financial or other conflicts of interest.

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