Original Research Article

ASSESSMENT OF QUALITY OF LIFE IN PATIENTS WITH CHRONIC KIDNEY DISEASE ON HAEMODIALYSIS: A SINGLE CENTRE EXPERIENCE - RETROSPECTIVE STUDY

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Abstract
Background: Hemodialysis has a substantial impact on the quality of life (QoL) of patients with chronic kidney disease (CKD). Evaluation of QoL can help in the early prediction of disease outcomes like the efficacy of treatment and the survival of patients. **Aim:** This study evaluated the QLI among patients with CKD undergoing hemodialysis. **Materials and Methods:** The study included patients with CKD undergoing haemodialysis, aged between 9-70 years. Detailed medical history, demographics, and haematological and biochemical parameters were analysed. The QLI was assessed using the Ferrans and Powers Quality of Life Index (QLI). The Chi square test, independent sample t test, and Spearman's correlation analysis tests were used for statistical analysis. **Results:** Out of 96 patients with CKD on haemodialysis, 26% and 24% were from the age groups <30 years and 30-40 years, respectively. A male preponderance was observed (n=63). The majority of patients were married (n=71), educated (n=83) and had low economic/income status (n=55). Most patients had poor (35.4%) and average QLI (58.3%). The total QLI score was significantly lower in patients with low income than in patients with high income (p=0.035). All biochemical parameters were comparable when compared between patients with good, average and poor QLI. Age was positively correlated with random blood sugar levels (r=0.456, p<0.001), cholesterol (r=0.245, p=0.016), and serum phosphate (r=0.244, p=0.017). A significant negative correlation was observed between iPTH level and treatment duration (r= -0.251, p=0.013) and between serum urea and haemoglobin (r= -0.251, p=0.035). **Conclusion:** The present assessment of quality of life in patients with chronic kidney disease on haemodialysis results showed that haemodialysis had a major negative impact on patients' QLI and on their economic status.

INTRODUCTION

Management of patients with chronic kidney disease (CKD) on haemodialysis has become a worrisome problem for developing countries like India. The key reasons are poor quality of life (QLI) associated with haemodialysis, large economic burden due to expensive treatment, and resource limited settings.[1] Patients with CKD must undergo frequent dialysis treatments, and their lives become dependent on medical personnel and family members. They also must undergo major lifestyle changes, which include limitations on dietary habits as well as the physical activities of daily life. Further, these patients experience co morbidities such as pain, sleep disorders, depression, fluctuations in blood pressure,

and stomach aches, which substantially impact and reduce QLI.[2,3]

Evaluation of QLI in patients on haemodialysis can help in the early prediction of disease outcomes such as efficacy of treatment and survival. Additionally, this assessment will give proper direction to the patient's management strategy. Therefore, in the past decade, QoL assessment has come into the limelight as a better predictive marker of morbidity and mortality risk in CKD patients. Global as well as Indian data suggests the role of QoL as a predictive indicator of the disease outcome, and a research tool in assessing the effectiveness of therapeutic intervention, in CKD patients on haemodialysis.[4] Few Indian studies have used WHOQOL-BREF or SF-36 assessment tools to evaluate health-related QoL in patients with CKD. However, to the best of

our knowledge, there is no study from India that used the Ferrans and Powers Quality of Life Index (QLI) specific to people undergoing renal dialysis. QLI helps measure both satisfaction and the importance of various aspects of life. The QLI calculates five scores: quality of life overall and in four domains (health and functioning, psychological/spiritual domains, social and economic domains, and family). The present study aimed to assess the quality of life using Ferrans and Powers QLI among patients with CKD undergoing haemodialysis.

MATERIALS AND METHODS

A cross sectional observational study was conducted at the Pandit Deen Dayal Upadhyaya Dialysis Centre, Bangalore.

Inclusion Criteria
Patients aged between 9 years to 70 years with a diagnosis of CKD undergoing haemodialysis at least for the past one year were included in the study.

Exclusion Criteria
Those patients who declined to give consent or were seriously ill were excluded from the study.

Method
Detailed medical history and demographics (age, sex, education, employment, marital status, treatment duration) of all patients were recorded. Measurements of haematological and biochemical parameters were also done. The QLI was assessed using the Ferrans and Powers Quality of Life Index (QLI). It consisted of 34 statements under the question "how satisfied are you with" and 34 statements under the question "how important is it to you?". Patients assigned scores for each statement in a satisfaction and importance scale with values ranging from 1 to 6. In the first part, the scale ranges from very unsatisfied (1) to be very satisfied. In the second part, the scale ranges from without any importance (1) to very important. QLI score evaluation was based on the levels of satisfaction and importance in four dimensions: Health/functioning, Psychological/spiritual, Socioeconomic and Family. Score interpretation was done using the computer syntax for SPSS-PC. The final score was in the range of 0-30. Poor QLI was defined as subjects having <15 QLI index score, average QLI as subjects having 15-23 QLI score and good QLI as subjects having >23 QLI score.

The duration of the study was from July 2017 to December 2018.

Statistical Analysis
The data were analysed using SPSS software version 23. The qualitative data and quantitative data were expressed as mean and standard deviation (SD).

Comparative analysis was done using the Chi square test for qualitative data and the independent sample t test for quantitative data. Correlation analysis was done using Spearman's correlation coefficient. The rate of male and female was 2:1.

RESULTS

Table-1: A total of 96 CKD patients on haemodialysis were included in this study. Majority patients were <30 years of age (n=25; 26%). Male preponderance was observed with 63 males (65.5%) and 33 females (34.4%).

Table-2: Most common aetiology of CKD was chronic glomerulonephritis (CGN) (40.6%), followed by chronic interstitial nephritis (CIN) (28.1%), diabetic kidney disease (DKD) (27.1%), congenital anomalies of the kidney and the urinary tract (CAKUT) (2.1%), and obstructive uropathy (2.1%), Distribution of patients according to QLI scores.

Table-3: According to total QLI score, the majority of patients (QLI 58.3%) had average QLI. Similarly, according to health and functioning subscale score, QLI the majority of patients (56.3%) had average QLI. Based on the income, maximum patients with average QLI (n=56, 58.3%).

Majority of patients with poor and average QLI had lower income than patients with good QLI. However, there was no significant difference (p=0.217).

Table-4: There was no significant difference in the biochemical parameters between patients with good, average and poor QLI. Mean (SD) haemoglobin was comparatively higher in poor QLI patients [10.4 (8.7) g/dL] than good QLI [8.7 (2.7) g/dL] and average QLI [7.9 (1.7) g/dL] patients. But there was no significant difference observed in haemoglobin between these groups (p=0.117). QLI Mean serum urea was comparatively higher in patients with good QLI patients [150.9 mg/dL] than those with average QLI [115.3 mg/dL] and those with poor QLI [106.5 mg/dL]. QLI Cholesterol level was 216.7 mg/dL in patients with good QLI which was comparatively higher than 164 mg/dL in patients with average QLI and 160 mg/dL in patient with poor QLI.

Table-5: There was no significant difference observed in HF subscale score between poor QLI, average QLI and good QLI according to age, treatment duration and biochemical parameters. (p>0.05)

Age was positively correlated with random blood sugar levels (r=0.456, p<0.001), cholesterol (r=0.245, p=0.016), and serum phosphate (r=0.244, p=0.017).

Table 1: Demographic characteristics of overall population with total QoL score

Parameters	N = 96	Total QoL score Mean (SD)	P value
Age in years			
<30	25 (26.0)	16.52 (3.99)	
30-40	23 (24.0)	15.78 (5.46)	
41-50	16 (16.7)	16.18 (5.60)	0.907
51-60	19 (19.8)	17.21 (4.62)	
61-70	13 (13.5)	16.00 (4.81)	
Sex			
Male	63 (65.6)	16.49 (4.75)	0.700
Female	33 (34.4)	16.09 (4.97)	
Marital status			
Married	71 (74.0)	16.28 (4.9)	
Unmarried	24 (25.0)	16.33 (4.57)	0.356
Widow	1 (1.0)	22 (0)	
Education			
Illiterate	13 (13.5)	13.23 (3.29)	
10 years of basic education	51 (53.1)	16.82 (5.18)	0.064
12 years of basic education and PDC	23 (23.9)	16.39 (4.54)	
Degree	9 (9.3)	18.11 (3.58)	
Income			
25-50K	55 (57.3)	15.29 (4.03)	
51K-1L	37 (38.5)	17.91 (5.43)	0.035[a]
1.1L-3L	4 (4.2)	16.5 (5.91)	
Employment			
Working	48 (50.0)	17.02 (4.77)	0.176
Not working	48 (50.0)	15.68 (4.80)	
Treatment duration			
1 – 2 years	1 (1.0)	19 (0)	
2 – 4 years	93 (96.9)	16.3 (4.86)	0.811
4 – 6 years	2 (2.1)	17.5 (3.53)	
Data presented as n (%), unless otherwise specified. PDC, pre-degree course. [a]25-50 K verses 51 K-1L.			

**Table 2: Demographic characteristics of patients with poor, average and good QoL**

Parameter	Poor (N=34)	Average (N=56)	Good (N=6)	P value
Age, mean (SD)	42.4 (16.7)	40 (15)	52 (17.3)	0.199
Age group				
<30	7 (20.6)	18 (32.1)	0	
31-40	9 (26.5)	12 (21.4)	2 (33.3)	
41-50	6 (17.6)	8 (14.3)	2 (33.3)	0.801
51-60	7 (20.6)	11 (19.6)	1 (16.7)	
61-70	5 (14.7)	7 (12.5)	1 (16.7)	
Sex				
Male	20 (58.8)	39 (69.6)	4 (66.7)	0.577
Female	14 (41.2)	17 (30.4)	2 (33.3)	
Marital status				
Married	26 (76.5)	39 (69.6)	6 (100)	
Unmarried	8 (23.5)	16 (28.6)	0	0.764
Widow	0	1 (1.8)	0	
Education				
Illiterate	8 (23.5)	5 (8.9)	0	
10 years of basic education	16 (47.1)	30 (53.6)	5 (83.3)	0.150
12 years of basic education and PDC	9 (26.5)	14 (25)	0	
Degree	1 (2.9)	7 (12.5)	1 (16.7)	
Employment				
Working	14 (41.2)	30 (53.6)	4 (66.7)	0.366
Not working	20 (58.8)	26 (46.4)	2 (33.3)	
Income				
25K-50K	21 (61.8)	33 (58.9)	1 (16.7)	
51K-1L	12 (35.3)	20 (35.7)	5 (83.3)	0.217
1.1L-3L	1 (2.9)	3 (5.4)	0 (0)	
Treatment duration				
1 – 2 years	0 (0)	1 (1.8)	0	
2 – 4 years	34 (100)	53 (94.6)	6 (100)	0.697
4 – 6 years	0 (0)	2 (3.6)	0	
Data shown as n (%), unless otherwise specified. iPTH, intact parathyroid hormone; PDC, pre-degree course; QoL, quality of life; RBS, random blood sugar.				

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Table 3: Biochemical characteristics of poor, average and good QoL

Biochemical parameters, mean (SD)	Poor (N=34)	Average (N=56)	Good (N=6)	P value
Haemoglobin (g/dL)	10.4 (8.7)	7.9 (1.7)	8.7 (2.7)	0.117
Serum creatinine (mg/dL)	12.9 (2.3)	8.8 (7.8)	11.4 (7.0)	0.450
RBS (mg/dL)	122.5 (47.1)	127.8 (43.4)	135.5 (33.8)	0.750
Serum urea (mg/dL)	106.5 (59.8)	115.3 (67.9)	150.9 (86.2)	0.321
Serum albumin (g/dL)	3.7 (1.2)	3.6 (3.1)	3 (0.7)	0.813
Cholesterol (mg/dL)	160 (30.8)	164 (61)	216.7 (86.6)	0.062
Serum calcium (mg/dL)	8.4 (1.2)	8.2 (1.1)	8.3 (0.8)	0.573
Serum phosphate (mg/dL)	4.8 (1.7)	7.2 (14.6)	6.1 (1.2)	0.614
iPTH (pg/mL)	217.3 (203.5)	269.5 (321.4)	361 (428.2)	0.479
Vitamin D3 (ng/mL)	22.7 (30.7)	19 (18.7)	10.6 (5.6)	0.472
Data shown as n (%), unless otherwise specified. iPTH, intact parathyroid hormone; QoL, quality of life; RBS, random blood sugar.				

Table – 3
Biochemical characteristics of poor, average and good QoL
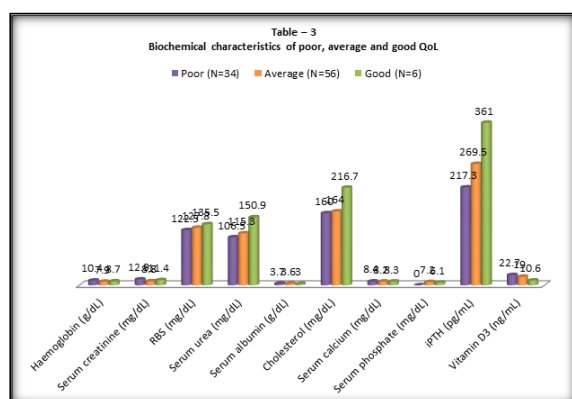
Table 4: Correlation between study parameters

Parameter 1	Parameter 2	Spearman's correlation	P value
Age (Years)	RBS (mg/dL)	0.456	<0.001
	Cholesterol (mg/dL)	0.245	0.016
	Serum phosphate (mg/dL)	0.244	0.017
	Vitamin D3	-0.248	0.015
Treatment duration (years)	iPTH (pg/mL)	-0.251	0.013
Haemoglobin (g/dL)	Serum urea (mg/dL)	-0.251	0.035
iPTH, intact parathyroid hormone; QoL, quality of life; RBS, random blood sugar.			

DISCUSSION

The present QOL assessment has become a vital predictor of CKD outcomes such as morbidity and mortality in patients on haemodialysis. The present study evaluated QLI among south Indian patients with CKD on haemodialysis which will be helpful to nephrologists in the decision-making of management strategies. Most patients in the present study had average to poor QLI, with only 6.3% of patients having good QLI, suggesting haemodialysis had a major negative impact on patients' QLI. The most common cause of CKD in this study population was CGN. Observations from a recent study corroborate these findings.[5] They reported poor and average QLI in 52% and 48% of patients on haemodialysis and none of the patients had good QLI. Recent studies have reported that, hypertension is a common aetiology of CKD. Other previous studies reported hypertension and diabetes as major aetiologies of CKD.[6,7]

In the present study, the total QLI score was significantly lower in patients with low income than in patients with high income, suggesting that QLI may depend on the economic status of the patients.

These results are in concordance with the previous study.[8] They suggested that lower economic status and a higher educational level were associated with a lower quality of life. It is concluded that sociodemographic and clinical characteristics may influence the QLI in haemodialysis patients.[9] They supported these findings with the following reasons: i) participants with higher education had better quality of life, possibly because education allows deep understanding of the disease and compliance with the therapeutic regimen; and ii) higher education may reflect higher income and consequently the ability to afford treatment. On the contrary, the present study did not observe any positive association between higher education levels and better QLI. It was shown that educational level (p=0.047) and annual family income (p=0.000072) were significantly associated with the quality of life among CKD patients.[10]

The present study did not observe any significant correlation between QLI and the age of the patients. This observation discords with a recent study that reported that the overall quality of life was correlated with age.[11] A study showed that, older age, male gender, unemployment, and duration of dialysis

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adversely affected the QLI scores in prevalent haemodialysis patients and adequate management of some of these factors could influence patient outcomes.[12] Another study reported that patients older than 60 years had the worst report of the quality of life.[13] However, it was demonstrated that advanced age was associated with better overall mental health but worse physical functionality. The present study's observations completely contradict these results. This might be due to the low sample size, especially in the poor QLI group, which could have influenced the statistical significance.

In the present study, all biochemical parameters were comparable when compared between patients with good, average, and poor QLI. Although patients with average QLI and good QLI were anaemic, there was no significant difference between the groups.

The present study showed a decreasing trend in random blood sugar levels. Increased serum urea concentrations were also observed in descending order from patients with good QLI to those with poor QLI indicating poor protein intake in patients with poor QLI. The present study revealed a positive correlation between age and random blood sugar levels, cholesterol serum phosphate, while a negative correlation was found with vitamin D3 levels. These results indicate that age influences these biochemical parameters in CKD patients. In addition, a significant negative correlation was observed between iPTH level and treatment duration, serum urea, and haemoglobin. These results suggest that as CKD progresses, the haemoglobin levels decrease, and with the subsequent length of treatment, iPTH levels decrease.

A study was attempted to assess the link between QoL, nutritional status, race, and clinical outcomes in haemodialysis patients.[14] They concluded that MHD patients with a higher percentage of body fat or lower serum albumin or creatinine concentrations perceive a poorer QIL. MHD patients with higher total body fat perceive a lower QLI. The present study did not demonstrate any significant association between abnormal biochemical parameters and poorer QLI in patients with CKD on haemodialysis.

CONCLUSION

These observations revealed that the haemodialysis had a major negative impact on the patient's QLI and low economic status, suggesting these parameters had an influence on QLI.

Limitations of this study
Due to the small number of patients with good QLI, the comparative analysis of parameters and their association with QLI was limited. Also, a longer follow-up could have been useful in understanding the impact of haemodialysis on QLI in these patients. Hence, we have limited findings and results.

- There is no conflict of interest.
- Self-Funded.

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