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Treatment Burden and impact of dialysis on quality of life in chronic kidney disease patients: A cross-sectional study

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Abstract

Background: Chronic Kidney Disease (CKD) leads to significant physical, emotional, and financial burden, especially for patients undergoing dialysis. In India, a substantial population experiences limited healthcare access, further amplifying treatment burden and reducing quality of life (QOL).

Objective: To evaluate treatment burden and assess the impact of dialysis on QOL among CKD patients using standardized tools.

Methods: A prospective, cross-sectional study was conducted among 140 CKD patients receiving dialysis in a tertiary care hospital. Data were collected using the Treatment Burden Questionnaire (TBQ), Health-Related Quality of Life (HRQOL), and Kidney Disease Quality of Life (KDQOL-SF™) tools. Cardiovascular risk was assessed using the Framingham Risk Score. Statistical analysis was performed using SPSS version 24.

Results: Among 140 patients, 61.5% experienced a moderate treatment burden. Financial and administrative aspects were the most burdensome domains. HRQOL was predominantly affected by the underlying kidney disease. Framingham scores increased significantly with declining renal function. Traditional risk factors included male gender, middle age, and genetic kidney disease, while drug-induced nephropathy, hypertension, and elevated creatinine/BUN levels were noted as non-traditional risk factors.

Conclusion: Dialysis patients experience considerable treatment-related burden, which significantly impacts quality of life and is influenced by both traditional and non-traditional risk factors. Addressing these burdens through targeted interventions and patient–provider collaboration is crucial for improving long-term outcomes in CKD management.

Keywords: Dialysis; FRS Score; TBQ; CKD; HRQOL; Renal Failure; KDQOL

1. Introduction

Chronic Kidney Disease (CKD) is a progressive multifactorial disease with various etiologies such as sickle cell nephropathy, ischemic nephropathy, and glomerular disease causing considerable renal structural and functional impairment [1–3]. Found in approximately 10% of the population of the world, CKD is significantly related to increased risk of mortality, cardiovascular complications, and hospitalization [4]. It is especially high in developing nations like India due to diabetes, hypertension, and late-stage diagnosis leading to increasing CKD prevalence [5].

Hematuria, proteinuria, and functional filtration abnormalities commonly present as early signs of nephron injury [6–8], whereas reflux nephropathy and Mesoamerican nephropathy are geographically important causes of renal

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impairment [9,10]. Underdiagnosis and late presentation are evident in epidemiological data for predominantly resource-poor populations [11,12]. Evidence from longitudinal studies has highlighted the necessity of early renal function assessment and risk stratification to avert progression to end-stage renal disease (ESRD) [13,14].

Advances in genomics and risk prediction software have improved our knowledge of CKD pathogenesis, including the pathogenic roles of hyperfiltration, glomerular hypertension, and lipid nephrotoxicity in progression to disease [15–20]. Uric acid disturbances, smoking, and dietary acidosis have also been identified as modifiable risk factors [21–27], and intense control of comorbid conditions such as diabetes and hypertension continues to be critical in temporizing CKD-related complications [28,29].

Although dialysis is a mainstay of renal replacement treatment, its attendant burdens — anemia, diminished quality of life, and cardiovascular risk — are well established [30,31]. As the evidence mounts, it appears that patient-reporting outcomes, treatment burden, and measures of quality of life are essential in assessing the effectiveness of long-term care among multimorbid CKD patients [32,33]. Cardiovascular disease, the most common cause of death in CKD, further supports the imperative of integrated and patient-focused care models [34].

1.1. Rationale and Objective

The present study aimed to evaluate the treatment burden and quality of life in dialysis patients and, at the same time, evaluate their cardiovascular risk with standard instruments. It aims to determine clinical, psychosocial, and functional determinants influencing patient outcomes in CKD to provide useful suggestions towards developing multidisciplinary approaches for effective management in resource-limited environments.

2. Methodology

2.1. Study Design and Setting

This was a prospective, cross-sectional study conducted over a period of ten months in the dialysis units of a 450-bedded tertiary care hospital in Kerala, India. The study focused on assessing treatment burden, quality of life (QOL), and cardiovascular risk among patients with chronic kidney disease (CKD) undergoing hemodialysis.

2.2. Study Population

A total of 140 patients diagnosed with CKD and undergoing dialysis (hemodialysis) were recruited using convenience sampling. Inclusion criteria were:

- Age ≥ 18 years
- On haemodialysis for ≥3 months
- Able and willing to give written informed consent
- Exclusion criteria included:
- Cognitive impairment or psychiatric illness
- Pregnant women or unconscious patients
- Terminally ill patients or those recently hospitalized
- Unwillingness to participate

2.3. Data Collection Tools

Data were collected using structured, validated tools:

- Demographic and Clinical Data Sheet: Collected data on age, gender, education, occupation, income, comorbidities (e.g., diabetes, hypertension), duration and type of dialysis, and medication burden.
- Treatment Burden Questionnaire (TBQ): The TBQ is a validated instrument assessing patients perceived burden related to healthcare tasks, including medication, appointments, monitoring, self-care, and lifestyle changes [9]. Scores range from 0 (no burden) to 150 (maximum burden), with higher scores indicating greater treatment workload.
- KDQOL-SF™ Version 1.3: This Kidney Disease Quality of Life Short Form is widely used in dialysis populations and includes 36 generic items from the SF-36 and 43 kidney disease-specific items [13]. Domains include physical functioning, emotional well-being, symptoms, burden of kidney disease, and work status.

- Framingham Risk Score (FRS): Cardiovascular risk was estimated using the Framingham Risk Score, which incorporates age, gender, systolic blood pressure, cholesterol levels, smoking status, and diabetes to estimate 10-year risk of cardiovascular events [16].

2.4. Ethical Considerations

The study was approved by the Institutional Ethics Committee of St. James Hospital, Chalakudy (Approval No: IHEC/SJCP/A-001/2021-2022). Written informed consent was obtained from all participants, including permission for publication of anonymized data. All ethical procedures were followed under the Declaration of Helsinki.

2.5. Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS software.

Normality test for continuous variables was done using the Shapiro-Wilk test, Kolmogorov -Simonov test. Descriptive statistics for risk factors using frequencies & median interquartile range (IQR) were done to describe variables & to express TBQ and HRQOL/KDQOL

The relationship between TBQ & KDQOL was done using correlation analysis.

TBQ was correlated against both the total perceived KDQOL & 5 dimensions of the KDQOL (PCS, MSC, Burden of kidney disease, symptoms/problems & effect of kidney disease

Association of variables with KDQOL was done using Chi-square tests.

The p-value <0.05 was considered statistically significant

3. Result and discussion

140 of the 160 eligible patients were enrolled in the study. Because several patients declined to participate, we approached 160 potential participants versus our target of 140. All responses were obtained using an interviewer-administered technique; therefore, no missing or inaccurate data was obtained. The data analysis included all 140 patient responses.

Table 1 Test for normality in continuous variables (n=140)

Variables	**Kolmogorov-Smirnov**			**Shapiro-Wilk**		
	Statistic	df	*p-value*	Statistic	df	*p-value*
Age	0.103	140	*<0 .001*	0.975	140	*< 0.01*
Creatinine	0.102	140	*< 0.001*	0.952	140	*<0 .001*
Calcium	0.315	140	*<0 .001*	0.729	140	*< 0.001*
Total cholesterol	0.135	140	*< 0.001*	0.952	140	*<0 .001*
BUN	0.222	140	*<0 .001*	0.701	140	*< 0.001*
Burden	0.103	140	*<0 .001*	0.969	140	*<0 .01*
KD Quality of Life	0.137	140	*< 0.001*	0.951	140	*< 0.001*

Whenever using a continuous variable, researchers must check the normality of the continuous variable's distribution using statistical analysis. In our study the statistical analysis used include Kolmogorov – Smirnov and Shapiro – Wilk test.

Normality test done in our study is used for continuous variables where it is used to inform selection of appropriate and robust statistical tests for treatment burden and Quality Of Life. According to the test it was found that the variables doesn't follow normal distribution.

3.1. Distribution Based on Gender (n = 140)

According to this cross-sectional study, it was found that 66% of the study population were males which counts 99 and 34% of the study population were females which counts 47.

From the study of Assessment of treatment burden and its impact on quality of life in dialysis-dependent and pre-dialysis chronic kidney disease patients by Asmaa Al-mansouri et. al, the total number of populations was found to be 280. And 153 patients were males and 127 patients were females, where a similar male predominance was observed.

3.2. Distribution Based on Age (n = 140)

According to this study, the maximum number of patients belong to the age group of 61 – 80 years. The oldest patient in this study was 92 years old and the mean age of participants in this study was found to be 59.6 years. As per this study it was found that middle-aged patients were most commonly affected with chronic kidney disease.

A similar result was found in a study called "Non-traditional risk factors in chronic kidney disease: correlation between creatinine clearance, Framingham risk score, endothelial dysfunction, and inflammation" conducted by Ahmed Mohamed Tawfk et.al had a mean age of 58 which proves the significance of age as a risk factor in CKD.

3.3. Distribution of Comorbidities in Patients With CKD

According to this study, higher prevalence is seen for hypertension followed by Diabetes, eye diseases, cardiac, dyslipidaemia and other diseases such as breathing issues, depression, etc. In a study conducted by Alan S. Go, MD et. al called chronic kidney disease and the Risks of Death, Cardiovascular Events, and Hospitalization most of the patients had dyslipidaemia with higher prevalence compared to other diseases.

In this study, CKD patients have a mean comorbidity of 3 chronic medical conditions. The most prevalent chronic medical condition is hypertension (85%) and diabetes (53.6). Detailed explanation is provided in Figure 1 where high-risk values are shown in red and low risk values are shown in green.

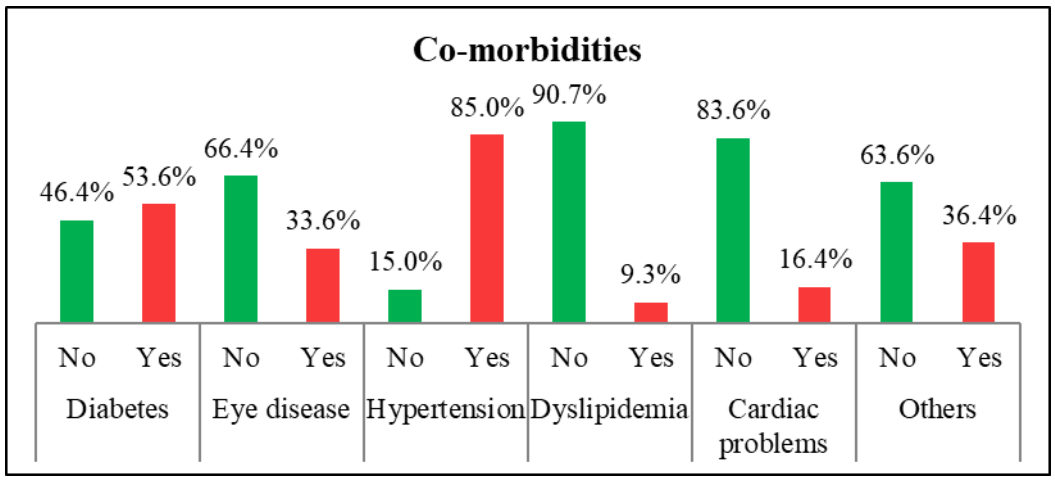

Figure 1 Distribution of Comorbidities in Patients with CKD

The frequency distribution for hypertension is 119 in the total population of 140 patients followed by Diabetes for 75 patients, Eye disease for 47 patients, Cardiac problems for 23 patients, Dyslipidaemia for 13 patients and other diseases for 51 patients.

3.4. Distribution Among Diabetic Patients (n=140)

Among Diabetes patients enrolled in this study, 2.85% of the population had Type 1 DM and 50.71% of the population had Type 2 DM.

3.5. Distribution Based on Other Demographic Characteristics

A summary of CKD sociodemographic factors is provided in Table 2. Around 58.6% of the population had primary education and 77.1% of the population were unemployed. Among the patients who were enrolled in the study, the

majority of the patients were married when compared with the unmarried population. When comparing the smoking status, majority of the patients never smoked followed by former smokers and current smokers. Majority of the population has no income (54.3%) and 30.7% of the population has an income above 10,000 followed by 15% of the population with an income below 10,000.

Table 2 Frequency distributions on demographic variables (n = 140)

Variables		**f**	**%**
Gender	Male	101	72.1%
	Female	39	27.9%
Marital status	Unmarried	11	7.9%
	Married	129	92.1%
Smoking status	Never	125	89.3%
	Former	12	8.6%
	Current	3	2.1%
Monthly income	No income	76	54.3%
	< 10,000/-	21	15.0%
	> 10,000/-	43	30.7%
Employment status	Unemployed	108	77.1%
	Retired	7	5.0%
	Employed	25	17.9%
Education	No education	16	11.4%
	Primary	82	58.6%
	Secondary	18	12.9%
	College	24	17.1%

Frequency distribution done for each variable shows that the actual number of observations falls under the percentage of observation.

A similar predominance of non-smokers, low educational level, and unemployment was observed in a study conducted by Saleen Jessani et.al which proves the negative impact of CKD and dialysis on the population.

3.6. Analysis of The Burden of Treatment Among CKD Patients

Treatment burden among CKD patients was assessed using Treatment burden Questionnaire (TBQ). The participants reported a median TBQ range of 61.5, which shows most of the patients have moderate treatment burden. Here, 31.42% (TBQ score 0 – 50) of the population shows low burden, 60.71% (TBQ score 51 – 99) of the population shows moderate burden, and 7.85% (TBQ score 100 – 150) of the population showed high burden.

In Figure 2, the 5 dimensions of TBQ are categorized based on low burden, moderate burden and high burden. In case of medication burden (range 0 – 40) low burden (0 – 15) was seen in 63 patients, and moderate burden (16 – 25) was seen in 57 patients and high burden (26 – 40) was seen in 20 patients.

In case of administrative burden (0 – 60), Low burden (0 – 20) was seen in 57 patients, moderate burden (21 – 40) was seen in 81 patients and high burden (41 – 60) was seen in 2 patients.

In the case of financial burden (0 – 10), low burden (0 – 3) was seen in 12 patients, Moderate burden (4 – 7) was seen in 17 patients, and high burden (8 – 10) was seen in 111 patients.

In the case of lifestyle burden (0 – 20), Low burden (0 – 7) was found in 47 patients, Moderate burden (8 – 14) was found in 68 patients and high burden (16 – 20) was seen in 25 patients.

In the case of Social burden (0 – 20), Low burden (0 – 7) was found in 55 patients, Moderate burden (8 – 14) was found in 63 patients, and high burden (16 – 20) was seen in 22 patients.

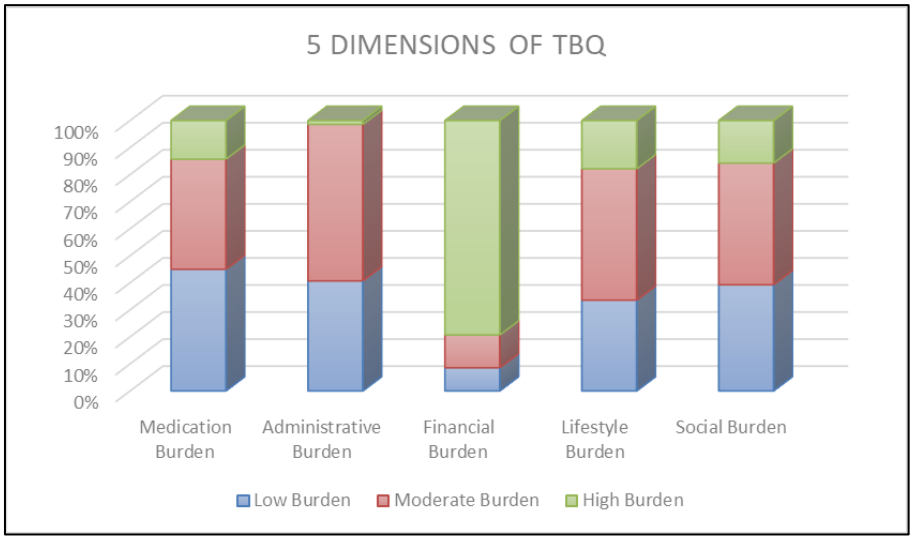

Figure 2 Dimensions of Treatment Burden Questionnaire

Table 3 TBQ Categories (n = 140)

TBQ Categories	No. of Patients	Median
Low Burden	44	61.5
Moderate Burden	85	
High Burden	11	

Where 0 – 50 is the Low burden, 51 – 99 is the Moderate burden and 100 -150 is the High burden. In the study "Assessment of treatment burden and its impact on quality of life in dialysis-dependent and pre-dialysis chronic kidney disease patients" by Asmaa Al-mansouri et. al, the participants reported a median score of 40.5.

Further analysis of 5 dimensions of TBQ is illustrated in table 4. Perceived treatment burden of the 5 dimensions of TBQ is reported from highest to lowest as follows; Medication burden 18, Administrative burden 12, Financial burden 10, Lifestyle burden 8 and social burden 3.

Table 4 Analysis of 5 Dimensions of TBQ Among Patients With CKD (n = 140)

Sl. No	Variables	Range	Median
1	Medication Burden	0 – 40	18
2	Administrative Burden	0 – 60	12
3	Financial Burden	0 – 10	10
4	Lifestyle Burden	0 – 20	8
5	Social Burden	0 – 20	3

According to a study conducted by Adem Sav et.al named "Treatment Burden and Chronic Illness: Who is at Most Risk?" They concluded that for the five dimensions of treatment burden, social, medical, and administrative burden were predicted by the same cluster of variables: number of conditions, age, presence of an unpaid carer, and diabetes[35].

However, in addition to these variables, financial dimensions were also predicted by education level, ethnicity and health insurance. The educational level also influenced the lifestyle burden.

3.7. Laboratory Data of the Population

In this study, the mean creatinine range was found to be 8.1 mg/dl which shows that most of the patients (82) have a moderate burden. Calcium range was found to be 7.6mg/dl which was found to be a normal range. Similarly mean total cholesterol range was also found to be normal (176.88mg/dl). But BUN range was found to cause moderate burden as 109 patients were having abnormal BUN range with a mean range of 55.42mg/dl.

The study called "Non-traditional risk factors in chronic kidney disease: correlation between creatinine clearance, Framingham risk score, endothelial dysfunction, and inflammation" conducted by Ahmed Mohamed Tawfk et.al concluded with the mean results of creatinine 5.52 mg/dl, calcium 8.73 mg/dl, Total Cholesterol 152.17 mg/dl.

Table 5 FRS Score (n = 140)

Burden	FRS score	f	%
High	>30	90	64.3%
Low – moderate	< 30	50	35.7%

The Framingham Risk Score is a sex-specific formula that estimates an individual's 10-year cardiovascular risk. The Framingham Risk Score was first designed to evaluate the 10-year risk of getting coronary heart disease using data from the Framingham Heart Study.

The parameters used to calculate Framingham risk score include Sex, Age, Total Cholesterol, HDL, systolic blood pressure, On medication for hypertension, Smoker? Diabetic? Known vascular disease.

In this study, 64.3% of the population showed high cardiac risk in upcoming 10 years and 35.7% of the population showed low to moderate risk.

Table 6 Aetiology of CKD (n = 140)

Aetiology of CKD	Number/Percentage
HTN	(25)17.85%
Drug-induced	(10)7.14%
Genetic Cause	(14)10%
Reflux Nephropathy	(11)7.85%
Unknown	(80)51.14%

In this study 17.85% of the population had hypertension as an aetiology, followed by genetic cause (10%), Drug induced (7.14%), Reflux Nephropathy (7.85%) and unknown factors.

A similar etiological distribution was seen in a study conducted by Satyanarayana R. Vaidya et.al named "Chronic kidney disease" where, 30 – 54% of the population had DM as the aetiology followed by Hypertension (3.9%), Primary glomerulonephritis (8.2%), Chronic Tubulointerstitial nephritis (3.6%), Hereditary or cystic disease (3.1%), Secondary glomerulonephritis or vasculitis (2.1%), Plasma cell dyscrasias or neoplasm (2.1), Sickle Cell Nephropathy (SCN) which accounts for less than 1% of ESRD patients in the United States.

Table 7 Traditional Risk Factors (n = 140)

Sl.No	Risk Factor	No. of Patients	%
1	Male	99	66%
2	Middle-aged	63	45%
3	Genetic Kidney Disease	14	10%

Table 8 Non – Traditional Risk Factors (n = 140)

Sl. No	Risk Factors	No. of Patients	%
1	Drug-induced kidney disease	10	7.14%
2	Hypertension	119	85%
3	Creatinine	138	98.54%
4	BUN	132	94.28%

Traditional risk factors: According to this study, it was found that male & middle-aged patients have a major predominance compared to the normal population. Genetic Kidney disease was found as an etiological factor in 10% of patients.

Non - traditional factors: According to this study, around 7.14% of the population have drug-induced kidney disease. 85% of the population had hypertension as an etiology. And other laboratory values such as creatinine range (mean 8.15±3.13) and BUN (55.43 ± 42.48) were above the normal range for 138 and 132 patients respectively in the study population.

Table 9 Descriptive Statistics for Risk Factors (n = 140)

Variables	Mean	Median	SD	Min	Max	IQR	
						Q_1	Q_3
Age	59.1	60	13.45	29	85	49	70
Creatinine	8.15	8	3.13	1.3	18.2	6.9	10
Calcium	769	8	1.83	0.42	10.9	7.85	8.65
Total cholesterol	176.89	178	46.87	81	280	132.75	220
BUN	55.43	39.9	42.28	10.73	240	30	60.08
Burden	64.51	60	21.81	20	111	47	80
KDQOL	44.63	45.35	10.15	15.83	67.22	39.58	50.28

Descriptive statistics were conducted to describe the variables and to express the treatment-related burden and QOL. In this study, we can see that the mean treatment burden was found to be 64.51 ± 21.81 and the IQR was found to be 33. The mean KDQOL range was found to be 44.63 ± 10.15 and the IQR was found to be 10.7.

Table 10 Analysis Of Health–Related Quality of Life of Patients With CKD (n = 140)

Scale (number of items in scale)	Mean	Median	Stan. Dev.	n
Symptom/problem list	#N/A	#N/A	#N/A	137
Effects of kidney disease	58.35	59.38	13.04	140
Burden of kidney disease	20.71	18.75	15.01	140
Physical Health Composite	35.04	33.74	6.30	140
Mental Health Composite	39.96	40.00	5.39	140

According to our study effect of kidney disease showed major prevalence. This analysis majorly has 5 domains. They are; the symptom/problem list, Effect of Kidney disease, Burden of Kidney disease, Physical health composite and mental health composite. Effects of kidney disease include questions regarding how annoyed the responder is by fluid restrictions, dietary constraints, and their ability to work related to the house or travel. Feeling reliant on doctors and other medical personnel, stress or anxiety, sex life, and personal appearance. And the less affected scale is Burden of Kidney disease which includes questions about how much renal disease interferes with daily living, takes up time, frustrates the respondent, or makes the respondent feel like a burden.

A similar prevalence was found in a study conducted by Salim K mujais et.al.

Correlation Between KDQOL And Treatment Burden

Pearson's correlation test was conducted to study the relationship between perceived treatment burden measured using TBQ and Kidney disease quality of life measured using KDQOL questionnaire. As shown in the table, there was a negative correlation found between TBQ score and KDQOL score, where the symptoms/problem list showed a statistically significant p-value (<0.05). This indicates that the higher the treatment burden, the lower the quality of life.

Further correlation was conducted between risk factors and each domain of KDQOL. The results showed a negative correlation, which proves that as risk factors increase, quality of life decreases.

Table 11 Correlations With Age (n = 140)

Variables	Pearson Correlation	Significance *(p-value)*
Overall KDQOL	- 0.044	*0.603*
Five domains of KDQOL		
Symptoms/problems	0.069	*0.421*
Effect of kidney disease	0.0	*0.99*
Burden of kidney disease	-0.169	*< 0.05*
PCS	-0.071	*0.41*
MCS	0.086	*0.312*

Correlation with age show strong statistical significance with Burden of Kidney disease. Correlation with creatinine shows strong statistical significance with effect of kidney disease and MCS. Correlation with calcium, Cholesterol and BUN shows negative correlation but no statistical significance.

Table 12 Association of Variables with KDQOL Using Chi-Square Tests (n = 140)

Variables		**Quality of Life**		**χ2**	**df**	***p-value***
		Low	**High**			
Gender	Male	49	52	0.32	1	*0.57*
	Female	21	18			
Marital status	Unmarried	7	4	0.89	1	*0.35*
	Married	63	66			
Smoking status	Never	64	61	3.07	2	*0.22*
	Former	6	6			
	Current	0	3			
Monthly income	No income	35	41	1.69	2	*0.43*
	< 10,000/-	13	8			
	> 10,000/-	22	21			
Employment status	Unemployed	53	55	0.22	2	*0.896*
	Retired	4	3			
	Employed	13	12			
Education	No education	8	8	4.72	3	*0.194*
	Primary	40	42			
	Secondary	6	12			
	College	16	8			
Diabetes	No	33	32	0.029	1	*0.87*
	Yes	37	38			
Eye disease	No	48	45	0.29	1	*0.59*
	Yes	22	25			
Hypertension	No	6	15	4.54	1	*< 0.05*
	Yes	64	55			
Dyslipidemia	No	64	63	0.085	1	*0.77*
	Yes	6	7			
Cardiac problems	No	55	62	2.55	1	*0.11*
	Yes	15	8			
Others	No	44	45	0.031	1	*0.86*
	Yes	26	25			
FRS	< 30	28	22	1.12	1	*0.29*
	> 30	42	48			

According to this data hypertension shows very high statistical significance.

A similar statistical association was seen in a study called Assessment of treatment burden and its impact on quality of life in dialysis-dependent and pre-dialysis chronic kidney disease patients conducted by Asmaa Al-mansouri et.al where hypertension shows strong statistical significance.

4. Conclusion

Concept of treatment burden starts to gain greater attention in the past few years. Our findings suggests that a substantial proportion (more than one–third) of the CKD patients reported moderate treatment-related burden using TBQ. According to our study HRQOL is inversely proportional to TBQ. When the treatment burden increases the HRQOL decreases. A recent meta-analysis by Roberti et al. highlighted that being a person with ESRD always implied a high burden, time-consuming, invasive, and exhausting task, impacting all aspects of patients' and caregivers' lives, but the investigators recommended further research in that specific area. Treatment-related burden was higher in CKD patients with low education, Unmarried and unemployed. This could mean that patients with higher educational backgrounds have a better understanding of their chronic disease conditions, self-care, and coping skills. In addition, social statuses like divorce and the death of a spouse could lead to emotional problems, which may ultimately increase the treatment burden.

Similarly, having a co-morbidity such as Hypertension, Diabetes mellitus, blindness, etc has resulted in a significantly higher treatment burden. Patients who were female, less educated, unemployed, and higher stage of CKD, DM, HTN, Dyslipidaemia, and blindness reported significantly lower QOL compared to their counterpart groups. The highest perceived treatment burden was as follows: financial burden, administrative burden, medication burden, lifestyle burden, and social burden. CKD was found to be a powerful predictor of CVEs. Although the association between a decline in kidney function and CVD risk is not been fully understood up till now, there are some explanations. The high prevalence of traditional (such as age, sex, genetic issues, etc) and non – traditional (such as hypertension, drug-induced kidney disease, abnormal lab values, etc.) risk factors are the major accused factor in the pathogenesis. Barzouhi et. Al reported that patients with CKD appear to have a higher risk of CVD, independent of traditional risk factors.

Our study showed a negative correlation between KDQOL and various risk factors for CKD such as age, creatinine, Calcium, total cholesterol, and BUN where age, creatinine, and BUN showed strong statistical.

significance with various domains of KDQOL. This shows a very high need for both the patient and the physician to implement patient-specific interventions to overcome the negative impact of modifiable risk factors (Non-traditional risk factors. In case of non-modifiable risk factors such as age, genetic kidney disease, and sex; the patients should undergo constant monitoring to keep their symptoms under check.

The study concludes that a considerable amount of CKD patients suffered from treatment burden and deterioration in HRQOL at a varying degree of seriousness. Marital status, educational level, Employment status, and Co-morbidities were all factors that significantly lead to a higher perceived treatment burden. Additionally, there were a number of strong and moderate correlations between the TBQ score and the five dimensions of KDQOL. Our study suggests that treatment-related burdens should be taken into account in CKD management strategies. CKD patients are at high risk of CVEs with higher 10-year Cardio Vascular risk, especially in the late stages of the disease. Moreover, the previously identified factors that increase treatment-related burden should be considered when designing healthcare interventions directed toward the CKD population.

Compliance with ethical standards

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Disclosure of conflict of interest

The author, Nileena Anna Varghese, and Dr. Lincy George [Co–author] declare no conflict of interest related to the publication of this manuscript.

Statement of ethical approval

Ethical clearance for the study was obtained from the Institutional Ethics Committee of St. James Hospital, Chalakudy.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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