



A Prospective Study of Assessment On Cost of Illness and Its Impact on Quality of Life in Dialysis Patients

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Abstract:

Chronic kidney disease (CKD) is defined as kidney damage or a glomerular filtration rate (GFR) of less than 60 ml/min/1.73 m² for three months or longer. An artificial method for eliminating waste and extra water from the body is dialysis., is the only option for preserving renal function and patient health in advanced CKD. HRQOL, a subjective measure of how a disease and its treatment plan affect patients, is assessed using TBQ and KDQOL questionnaires. The study aim was to assess the QOL associated with health and the cost of disease in dialysis patients. HRQOL among dialysis patients is assessed by using TBQ and KDQOL-36 questionnaires. Objectives are to evaluate HRQOL among CKD patients receiving dialysis by using KDQOL-36 questionnaire. And to assess the cost of illness and its impact on QOL in dialysis patients using a treatment burden questionnaire. A prospective study was conducted including 150 dialysis patients which showed males at the age group of 56-65 years are more prone to CKD. Student T-test and ANOVA test for statistical analysis and Pearson correlation is used to assess correlation between treatment burden and HRQOL. Since chronic kidney disease (CKD) is a prominent cause of morbidity and mortality among patients, the assessment of health-related quality of life (HRQOL) is vital for improving their therapeutic results. QOL of dialysis patients can be improved by treating complications. Medication and financial burden are most observed in dialysis patients.

Keywords: Chronic kidney disease, dialysis, health related quality of life (HRQOL), kidney disease quality of life (KDQOL), treatment burden, Hypertension & Diabetes Mellitus.

1. Background:

Chronic kidney disease (CKD) has become a prominent cause of death and distress in the twenty-first century [1]. To avert the negative consequences associated with CKD, such as cardiovascular issues, end-stage renal disease, and increased mortality, primary care providers must ensure proper screening, diagnosis, and management [2]. The disease significantly influences the health-related quality of life (HRQOL) of patients at any stage [3]. CKD patients' QOL and treatment burden will be evaluated using the KDQOL-36 questionnaire and the treatment burden questionnaire, respectively [4]. Chronic kidney disease is characterized by kidney damage or an estimated GFR of less than 60 ml/min/1.73 m² for a period of three months or longer [5]. The most associated

causes of this disease are diabetes and hypertension [6]. When chronic kidney disease is first diagnosed, renal insufficiency or diminished renal reserve may result in renal failure. The usual method for diagnosing CKD is a blood test or a urine test that estimates ACR and GFR, respectively [7]. Chronic kidney disease has no symptoms in the early stages. The symptoms appear in stages four or five. Dry and itchy skin, frothy urine, loss of appetite, nausea, and other symptoms are a few indications and symptoms [2]. As the disease worsens, complications from CVD, anaemia, problems of the minerals and bones, and other conditions become more prevalent [9]. Certain drugs that are commonly used to treat chronic kidney disease include ACE inhibitors, ARBs, diuretics, DPP inhibitors, sulphonyl ureas, vitamin D and B12, and phosphate binders [10]. Dialysis or renal replacement treatment are necessary when kidney function declines gradually due to chronic kidney disease [5].

Dialysis is a medical intervention that involves the artificial removal of waste substances and additional water from the blood. While it can't fully replace lost kidney function, dialysis can partially control its functions [11]. Dialysis comes in two main flavours: hemodialysate and peritoneal dialysis. In peritoneal dialysis, waste is extracted from the abdominal cavity (peritoneum) using a dialysis filter. During hemodialysate, the body's excess water and waste materials are eliminated by a device called a dialyzer filter [12]. The most frequently mentioned side effects of hemodialysate are hypervolemia, hypotension, itching skin, infections, and overall discomfort [13].

HRQOL is a subjective indicator of a patient's response to a disease and its treatment plan [8]. Assessing the impact of disease, cost-effectiveness, healthcare quality and socio-economic position requires careful consideration of HRQOL [9]. The KDQOL-36 and treatment burden questionnaires are used to evaluate CKD patients' quality of life and burden from their therapy [4]. Both physical and emotional well-being is measured by the KDQOL-36 questionnaire [13]. Better quality of life and a heavier treatment load are indicated by higher scores on these questions [12].

2. Study Methods:

2.1. Study Design: This was a prospective study carried out in various hospitals in Vijayawada, Andhra Pradesh, among 150 chronic kidney disease patients receiving dialysis. Following the approval of the Institutional Ethics Committee and the acquisition of informed consent from participants, this study was conducted. Subjects were screened based on specific inclusion and exclusion criteria. The study focused on patients who fulfilled the inclusion criteria. Data collection was performed using a pre-designed form once the subjects were enrolled in the study. In this study each participant details like demographic details, co-morbidities, social history, frequency of dialysis and standard form questionnaires was asked to assess the HRQOL among CKD patients receiving dialysis and treatment burden questionnaire to evaluate the impact of cost of illness on QOL in dialysis patients were collected. Later evaluation of HR-QOL among CKD patients receiving dialysis and impact of cost of illness on QOL in dialysis patients is done. Collected data is evaluated and interpreted by using statistical software. Inclusion criteria include those patients who are willing to participate in our study, CKD patients in various age groups (adult age), co-morbidities, haemodialysis, patients who follow regular treatment management and exclusion criteria include those who are undergoing peritoneal dialysis, mentally ill, dementia patients, unconscious patients and below 25 years & above 65 years patients.

2.2. Study Operation: The KDQOL-36 questionnaire was used to assess HR-QOL among CKD patients receiving dialysis. Based on the PCS, MCS scores, kidney disease burden, problems and disease interference in their daily life scores QOL has been assessed. Also, TBQ was used, and scoring was given. Based on the scores obtained, patients have been categorized into fewer burdens (0-50), medium burden (51-100) and great burden (101-150) [20].

2.3. Statistical Analysis: Data entry was performed in Microsoft Office Excel, followed by analysis using the Student T-test and ANOVA test. Mean score was calculated. Statistics were deemed significant when $p<0.05$. To find the relationship between treatment load and HR-QOL, Pearson correlation analysis was used.

2.4. Sources of Data: Data was collected from dialysis receiving patients in various hospitals of nephrology department. We have explained to the patient as well as patient representative regarding the study, those who are willing to provide informed consent form to our study those subjects are considered.

3. Results:

In the study report have included 150 CKD patients taking dialysis and measured QOL among them by using different questionnaires like KDQOL for assessment of HRQOL and TBQ for assessment of treatment burden and we got the results as follows:

Table 1: Age, Gender Distribution and Social History among CKD with dialysis patients

Category	n	Percentage (%)
AGE		
26-35	23	15
36-45	38	25
46-55	40	27
56-65	49	33
GENDER		
MALE	104	69
FEMALE	46	31
SOCIAL HISTORY		
Smoker	50	54
Alcoholic	30	33
Both smoker & alcoholic	12	13

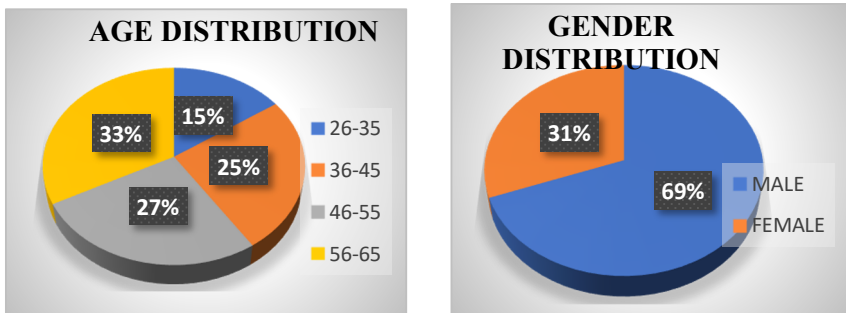


Figure 1: Age and Gender Distribution among CKD with dialysis patients

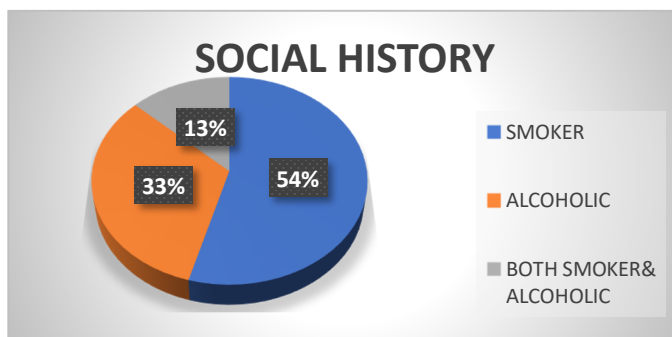


Figure 2: Social History among CKD with dialysis taking patients

Table 2: Types of co-morbidities among CKD with dialysis taking patients

Category	n	Percentage (%)
COMORBIDITIES		
HTN	120	44
DM	62	23
BOTH HTN& DM	45	16
CAD	20	7
Hypothyroidism	15	6
Others	11	4
DIALYSIS FREQUENCY		
Weekly once	16	11
Weekly twice	52	34
Weekly thrice	82	55

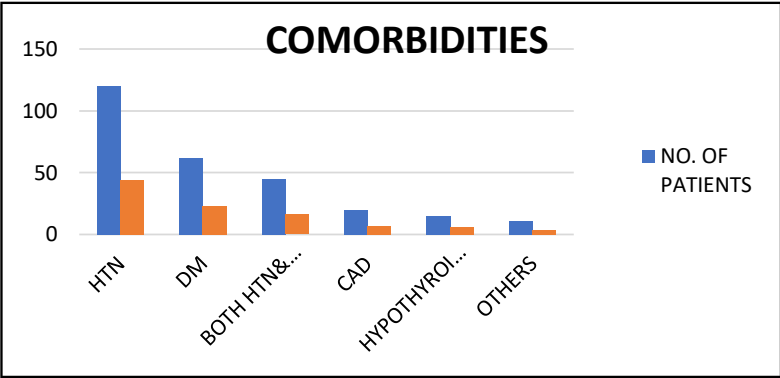


Figure 3: Types of co-morbidities among CKD with dialysis taking patients

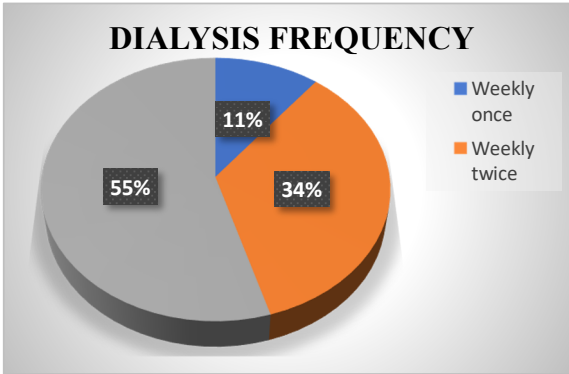


Figure 4: Dialysis Frequency among dialysis patients

Table 3: Physical & Mental Health

PARAMETERS	NO. OF PATIENTS		P VALUE
	AFFECTED	NOT AFFECTED	
General health	58 (38.66%)	92 (61.34%)	0.04623
Activity limits	60 (40%)	90 (60%)	
Ability to accomplish desired tasks	86 (57.33%)	64 (42.67%)	
Depression& anxiety	64 (42.67%)	86 (57.33%)	
Energy level	75 (50%)	75 (50%)	
Social activities	36 (24%)	114 (76%)	

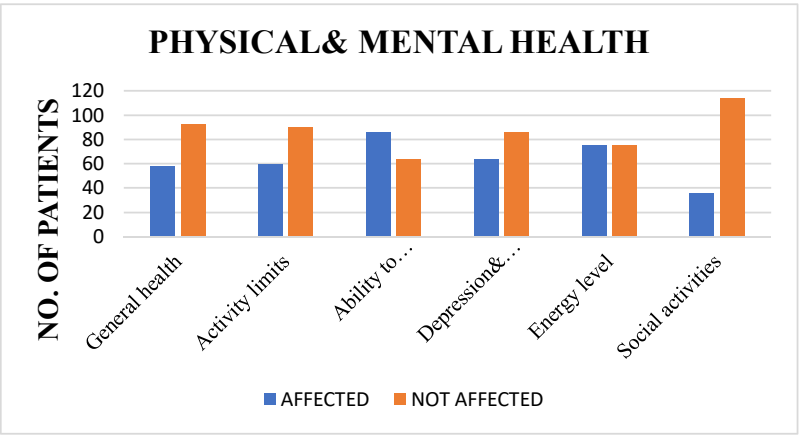


Figure 5: Physical and Mental health among dialysis patients

Table 4: Burden of Kidney Disease

PARAMETERS	NO. OF PATIENTS		P VALUE
	AFFECTED	NOT AFFECTED	
Kidney disease interferes with daily life	119 (79.33%)	31 (20.67%)	0.021433
Too much spending with kidney disease	116 (77.33%)	34 (22.67%)	
Frustration with kidney disease	92 (62%)	58 (38%)	
Burden on family	86 (58%)	64 (42%)	

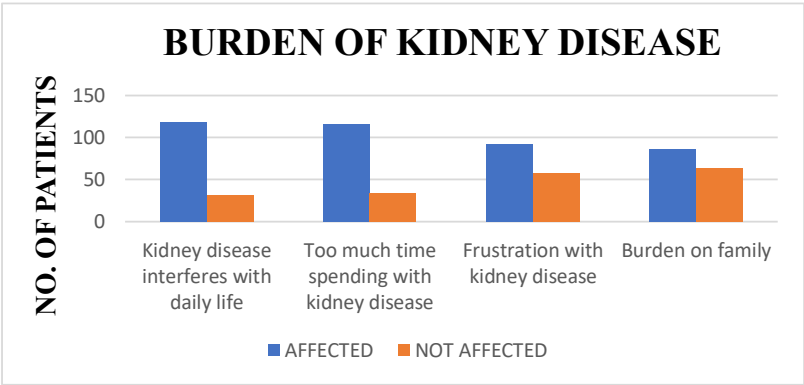


Figure 6: Burden of kidney disease among CKD with dialysis taking patients

Table 5: Complications

PARAMETERS	NO. OF PATIENTS		P VALUE
	AFFECTED	NOT AFFECTED	
Muscle soreness	53 (35%)	97 (65%)	0.000002174
Chest pain	36 (24%)	114 (76%)	
Cramps	61 (41%)	89 (59%)	
Itchy skin	51 (34%)	99 (66%)	
Dry skin	65 (43.34%)	85 (56.66%)	
Shortness of breath	44 (29.33%)	106 (70.67%)	
Faintness or dizziness	46 (30%)	104 (70%)	
Lack of appetite	51 (34%)	99 (66%)	
Nausea/ Stomach upset	44 (29.33%)	106 (70.67%)	
Numbness in hands or feet	51 (34%)	99 (66%)	
Washed out/drained	30 (20%)	120 (80%)	
Problems with access site	24 (16%)	126 (84%)	

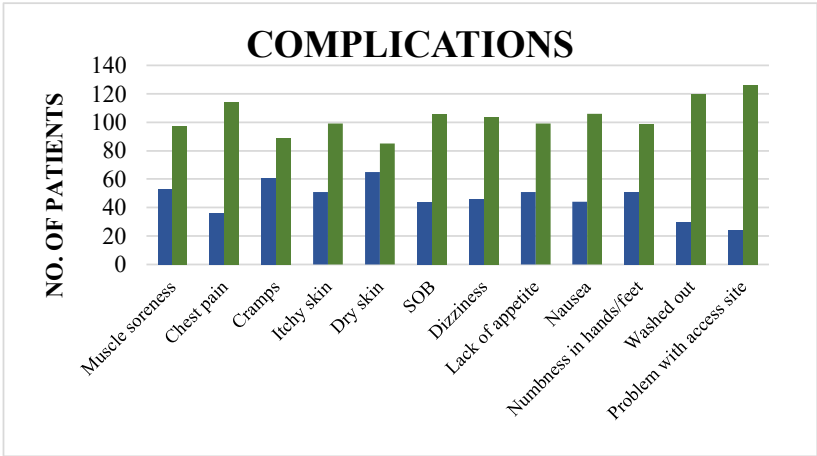


Figure 7: Complications or symptoms among CKD with dialysis receiving patients

Table 6: Kidney Disease's Impact on Daily Life

PARAMETERS	NO. OF PATIENTS		P VALUE
	AFFECTED	NOT AFFECTED	
Fluid restriction	60 (40%)	90 (60%)	0.00076
Diet restriction	52 (34.66%)	98 (65.34%)	
Ability to work	48 (32%)	102 (68%)	
Ability to travel	58 (38.66%)	92 (61.34%)	
Being dependent on others	33 (22%)	117 (78%)	
Stress/worries	48 (32%)	102 (68%)	
Personal appearance	67 (44.66%)	83 (55.34%)	

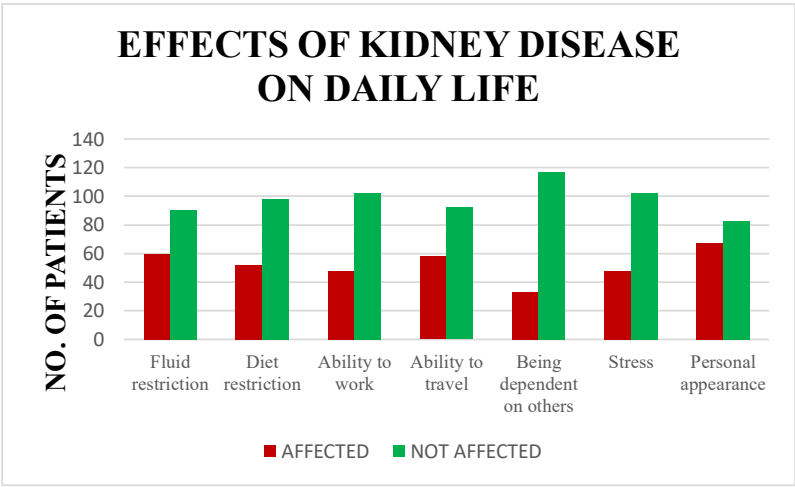


Figure 8: Effects of kidney disease on daily life among dialysis patients

Table 7: Treatment Burden

PARAMETERS	NO. OF PATIENTS		P VALUE
	AFFECTED	NOT AFFECTED	
Medication burden	91 (61%)	59 (39%)	0.027376
Administrative burden	31 (21%)	119 (79%)	

Financial burden	(58%)	(42%0	
Lifestyle change burden	67 (44.66%)	83 (55.34%)	
Social burden	64 (42.67%)	86 (57.33%)	

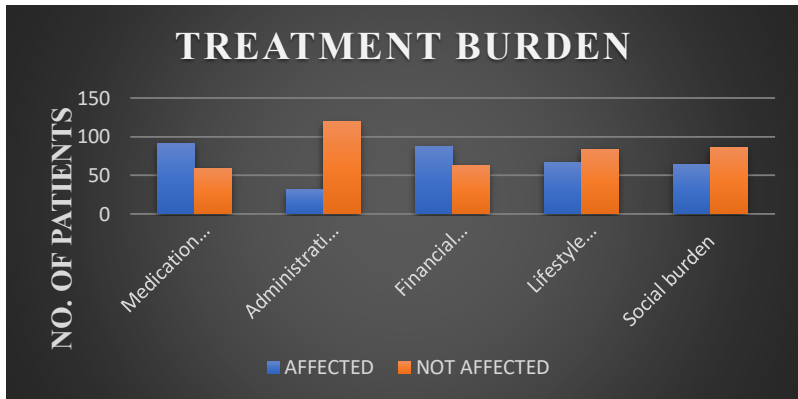


Figure 9: Treatment burden among dialysis patients

4. Discussion:

Chronic kidney disease (CKD), a noncommunicable disease, is characterized by reduced renal function and sustained decline in glomerular filtration rate (GFR) [14]. From Table 1 and Figure 1, among 150 patients, the majority were between the ages of 56 and 65 (33%) and the fewest were between the age of 26 and 35 (15%). Males 104 (69%) are more likely to have CKD and require dialysis than females 46 (31%). And most of them had HTN (n=120, 44%) and DM (n=62, 23%) from Table 2 and Figure 3. 50 (54%) patients were smokers, 30 (33%) were alcoholics, and 12 (13%) were both smokers and alcoholics from Figure 2. And it was found that out of 150 patients, 82 (55% of them) were receiving dialysis three times a week from Figure 4.

Most patients under the ages of 26-35 and 46-55 have poor physical and mental health. Females have poorer physical and mental health than males from Table 3 and Figure 5. The survey indicates that most patients fall within the age range of 46-55, predominantly female, facing challenges that span from health symptoms to financial issues, which often culminate in job loss, primarily due to the need for dialysis [15,16]. Patients aged 26-35 years and men are severely apprehensive, whereas those aged 46-55 years and females are moderately concerned about issues or complications. Purpura, dry skin, hyperpigmentation, and pale skin were the most common skin conditions [17] while reported the most frequent complications from Table 5 and Figure 7 were headache, cramping in the muscles, nausea and vomiting, and hypertension and others include chills, fever, back discomfort, chest pain, and itching [18]. Patients aged 26-35 years are extremely concerned 46-55 years are moderately concerned about the effects on daily life, whereas females are extremely and moderately concerned about

the effect of kidney disease on daily life from Table 6 and Figure 8, which could be due to fluid restriction, as excess fluid intake causes problems in CKD patients from Table 4 and Figure 6. Diet restriction was the most prevalent strain, followed by medication and restrictions on fluid consumption [19].

The concept of treatment burden from Table 7 and Figure 9, has gained significant attention in recent years, comprising five key dimensions: medication management, administrative responsibilities, financial costs, lifestyle adjustments, and social impacts [20]. According to the study, most patients are concerned about their medication and the financial load. The findings revealed that many patients between the ages of 26 and 35 are extremely anxious, while those between the ages of 46 and 55 are moderately concerned about their treatment load, with males being more bothered than females. The results show that males are very concerned about their medication burden and those under the age ranges of 26–35 and 56–65 are equally anxious. The findings indicate that patients who are younger than 56 to 65 years old, regardless of gender, have an administrative burden that is rather significant. The percentage of patients concerned about economic load, which comprises lifestyle, financial, and social burden depending on age, has been revealed by the results. The findings indicate that male patients and those under the age of 46–55 are experiencing financial hardship.

In this analysis, the student's t-test and ANOVA were utilized for statistical evaluation, leading to the acquisition of different p-values. A significant correlation between age and health-related quality of life (HRQOL) was found by the study, with a p-value of 0.000212. This study has shown that the p-value is 0.017084 and our results conclude that there is a significant relationship between HRQOL and gender. The results showed that the p-value was 0.000117 and our results concluded that there was a significant correlation between the amount of treatment and age. The analysis revealed a p value of 0.022059, which supports the conclusion that a significant relationship exists between treatment burden and gender. Pearson's correlation analysis was performed based on age and gender and showed a coefficient (r) of 1, meaning a perfect negative correlation between burden of treatment and HR-QOL.

5. Conclusion:

Our study has concluded that males are more prone to chronic kidney disease, taking dialysis and concerned about treatment burden than females. The results have shown that females are having poor mental & physical health issues. Most of the patients affected were greatly under the age of 56-65 years and along with that had a social history of smoking, taking dialysis for weekly thrice etc. Hypertension is the most observed co-morbidity among the study population. Mostly patients were concerned about the kidney disease interfering with their daily life and spending too much time and extremely concerned about the burden for the treatment of kidney disease. Dialysis patients frequently experienced complications, with the majority expressing great distress over cramping and dry skin. Dialysis taking patients can have a significant impact on their daily life, including fluid and diet restrictions. Study has concluded that mostly patients were concerned with medication and financial burden. Mostly under the age group of 36-45 and 46-55 years are extremely concerned about treatment burden. Thus, among dialysis patients, this study found a negative correlation between HRQOL and the treatment burden of chronic kidney disease.

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