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Quality of Life among CKD Patients with Hemodialysis – A Cross-Sectional Study

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ABSTRACT

Objectives: To assess quality of life (QOL) of patients undergoing Hemodialysis (HD)

Methods: A Cross sectional study was conducted among 461 subjects for a period 7 months at the dialysis unit, Guntur, South India, KDQOL-SF1.3 scale was used. Ethical committee permission (IEC/AMSH/2023/20) was obtained for the conduction of study.

Results: Total sample were 461 from that males (56%) were more than females (43.8%) respectively rural area 267(57.92**)** while subjects from urban area 194(42.08). Majority of the subjects are graduates who are 153(33.19%) followed by those who have completed their secondary education is 137(29.72%). It is understood that patients who have comorbidities from 5 to 10 years are 156(33.84) followed by10 to 15 years are more i.e. 145(31.45). Majority of the patients undergoing Hemodialysis are known to have poor nutrition levels 225(48.81Most of the subjects are in anemic condition 323(70%) whose Haemoglobin levels were found to be between 5-10g/dL. Majority of the patients 247(**77**.62) complained of fatigue. The SF12 subscale shows moderate scores, while burden of kidney disease scores exhibits higher variability. Stage III CKD patients exhibited the highest scores, particularly in symptoms and effects of kidney disease subscales, whereas stage V CKD patients had the lowest scores across all subscales.

Conclusion: The current study findings conclude that, the patients on Hemodialysis are not having adequate QOL (Quality of Life) in all the domains except patient satisfaction due to the variation in physio-chemical changes occurring in the blood chemistry which provides relief to the patient.

Keywords: Hemodialysis, Quality of life, South India

1. INTRODUCTION

Chronic kidney disease (CKD) has become one of the major medical problems worldwide. In India, the GBD 2015 ranks CKD as the 8th leading cause of death.[1] QoL is defined as "an individual perception of their position in life in the context of culture and value system where they live, and in relation to their goals, expectations, standards and concerns." Health related QOL represents the physical, physiological and social domains of health that are influenced by a person's experience, beliefs, expectations and perceptions.[2] Patients with CKD may experience a negative impact on their QOL, which comes from the anxiety that can appear before and during the treatment.[3]

Hemodialysis is a time – intensive, expensive, and requires fluid and dietary restrictions. Long term dialysis therapy itself often results in loss of freedom, dependence on caregivers, disruption of marital, family, and social life and reduced or loss of financial income. Due to these reasons, the physical, psychological, socioeconomic and environmental aspects of life are negatively affected, leading to compromised Quality of Life.[4] The assessment of QOL becomes mandatory as an outcome measure in the evaluation of adverse events and treatment effectiveness in various diseases conditions such as end stage renal disease (ESRD).[5]CKD is defined as kidney damage or an eGFR

<60ml/min/1.732 m square persisting for 3months or more irrespective of cause.[6] KD QOL SF 1.3 is an instrument, is a self report measure develop for the individuals with kidney diseases and dialysis.[7] KD QOL components: It has health

related concerned symptoms(12 items) effects of kidney disease on daily life (8 items), burden of kidney disease(4 items), work status (2 items) cognitive functions (3 items) quality of social interaction (3), sleep (4), social support (2), dialysis staff encouragement (2) and Pain Scale.[8] QoL, which encompasses a person's physical, mental, social, and overall health, is defined as satisfaction or enjoyment in life as it relates to their experience and context.[9]

2. MATERIALS AND METHODS

A cross sectional study was conducted among people undergoing dialysis in a multispecialty hospital in Guntur during the period of September 2024 to February 2025 for a period of 6 months. Ethical approval was obtained. (IEC/AMSH/2023/20). An informed consent has been obtained from the patients and also from the patient care takers. A validated Kidney disease quality of life Short form 36-SF^{TM} in local language Telugu. The form was translated into local language by the language experts and pilot study has been conducted among 10 patients to check for the understandability of the questionnaire. This tool consists of 19 components , where the first 11 belong to the stage 5 targeted areas which are divided into kidney disease component summary(KDCS), while the other 5 components were categorized into physical composite summary(PCS) and the remaining 4belongs to mental composite summary(MCS). All the items were given codes as per the KDQOL-SF user's manual. Finally the questionnaire was distributed to patients or care givers based on the requirement.

Patients were selected for this study when they meet these criteria of selection:

1. Patients diagnosed with Chronic Kidney Disease.
2. Aged 18 years or older and undergoing dialysis for a minimum of 3 months.
3. CKD patients with one or more co morbidities.

Patients excluded in this study were as follows:

1. Pregnant women with CKD
2. Medical records including clinician's admission notes, discharge summaries of previous hospitalizations (available with the subjects or in the out-patient file), reference note from other clinicians and discussion with the patient or their caretakers at the time of subject's inclusion were considered as sources of past medical and medication history for both in subjects and out subjects. Demographic data such as age and sex were noted. Subjects were interviewed and detailed history was obtained. Subjects were interviewed by using KDQOL-36 and prevalence of co morbidities data was taken. Those findings were recorded on a predesigned and pretested pro forma. The clinical history relevant to the subscales of KDQOL-36 and co morbidities was documented. The data was collected based upon the KDQOL-36. The quality of life of the different stages and prevalence of co morbidities was assessed in chronic kidney disease patients in a tertiary care hospital.

3. RESULTS

Total 461 subjects were identified undergoing dialysis.

Table 1: Distribution of study sample based on the gender undergoing dialysis

Male	Female
259(56.18)	202(43.82)

As in the table 1, total sample were 461. From that males (56%) were more than females (43.8%) respectively

Table 2: Distribution of CKD patients according to Location

Area	Patients on Hemodialysis (N=461)
Rural	267(**57.92)**
Urban	194(42.08)
total	461
Pearson r	0.9996
P value	0.0172
Significance	*

Among the study subjects 461, majority of the sample belonged to the rural area 267(57.92**)** while subjects from urban area 194(42.08). It is understood that people who are in rural area have less access to health care facilities while their counterpart are having an easy access to hospitals and medical facilities. Results were found to be significant with respect to the access to the health care facilities.

Table 3: Distribution of CKD patients according to Literacy level

Literacy	Patients on Hemodialysis
Illiterate	44(9.54)
Primary	80(17.35)
Secondary	137(29.72)
Graduation	153(**33.19)**
Post graduate	47(10.20)
total	461
Pearson r	0.9990
P value	<0.0001
Significance	****

From the above table 3, which shows that majority of the subjects are graduates who are 153(33.19%) followed by those who have completed their secondary education is 137(29.72%). Most of the people who completed their primary education are 80(17.35%). It was observed that around 47(10.20%) are possessing post graduation and an equal number are 44(9.54%) respectively.

Table 4: Distribution of CKD patients according to Duration of comorbidities

Years	No. of Patients on Hemodialysis
1 to 5	99(21.48)
5 to 10	156(**33.84)**
10 to 15	145(31.45)
>15	37(8.03)
total	461
Pearson r	0.9551
P value	0.0114
Significance	*

From the table 4, it is understood that patients who have comorbidites from 5 to 10 years are 156(33.84) followed by10 to 15 years are more i.e. 145(31.45). It is observed that 99(21.48%) are identified to be having co morbidities from 1 to 5 years. Very few of them i.e. 37(8.03%) are known to have co morbidities since more than 15 years. This table also represents that disease progression also depends on the number of years the subjects are suffering with comorbidities.

Table 5: **Distribution of CKD patients according to nutritional intake**

Nutrition intake level	**Patients on Hemodialysis**
Poor	225(**48.81)**
Moderate	177(38.39)
Good	50(10.85)
Total	**461**
Pearson r	0.9953
P value	0.0047
Significance	**

The above table 5 shows that level of nutrition is affected by the Hemodialysis. The results are highly significant. Majority of the patients undergoing Hemodialysis are known to have poor nutrition levels 225(48.81%) followed by moderate level of nutrition i.e 177(38.39%) and very few number of people inspite of undergoing Hemodialysis 50(10.85%) consecutively.

Table 6: **Distribution of CKD patients according to the Haemoglobin**

Haemoglobin (Hb) (g/dL)	**No. of patients on hemodialysis**
<5	82(17.79)
5 to 10	323(70.07)
>10	56(12.15)
Total	**461**
Pearson r	0.9704
P value	0.0296

Significance	*

From the table 6, most of the subjects are in anemic condition 323(70%) whose Haemoglobin levels were found to be between 5-10g/dL, followed by 82(17.79%) with less than 5g/dL. It is observed that 56(12.15%) with more than 10g/dL respectively.

Table 7: Distribution of Hemodialysis patients according to the outcomes

Dialysis Outcomes	**Male**	**Female**	**Total**
Fatigue	146(45.91)	101(31.76)	247(**77.62**)
Life participation	60(18.87)	39(12.26)	99(**31.13**)
Depression	98(30.82)	89(27.99)	187(**58.81**)
Anxiety	89(27.99)	102(32.08)	191(**60.06**)
Cramps	102(32.08)	92(28.93)	194(**61.01**)
Pains	77(24.21)	90(28.30)	167(**52.52**)
Pruritis	60(18.87)	42(13.21)	102(**32.08**)
Restless leg syndrome	78(24.53)	46(14.47)	124(**38.99**)
Sexual dysfunction	58(18.24)	46(14.47)	104(**32.70**)
Sleep quality	87(27.36)	59(18.55)	146(**45.91**)
Total	**318**	**318**	**100**
Pearson r	0.9376	0.9372	
P value	<0.0001	<0.0001	
Significance	****	****	

From the table 7, it is seen that the outcomes after Hemodialysis were observed. Majority of the patients 247(**77**.62) complained of fatigue, cramps by 194(61.01), anxiety 191(60.06) followed by depression 187(58.81), pains by 167(52.52) followed by sleep quality 146(45.91%). Symptoms such as sexual dysfunction, restless leg syndrome, pruritus and participation in life activities around 30-35% respectively. Results after dialysis were found to be highly statistically significant.

Table no 8: Distribution of sample population based on stages of chronic kidney disease

S.No	**Stage**	**No. of. Subjects (n = 461)**	**Percentage (%)**
1	Stage III	57	12.22
2	Stage IV	98	21.21
3	Stage V	306	66.66

From the table 8, it is observed that majority of the patients are in stage 5, 306(66.66%) followed by 98(21%) in stage 4 and least number of people in stage 3 57(12.22%) respectively.

Table no 9: Quality of life scores by subscales

S.No	**Subscales**	**Total KDQOL Score**	
		Mean ± SD	**Median ± IQR**
1	SF 12	47.65 ± 17.96	49.17 ±20.84
2	Burden of kidney disease	29.97 ± 24.87	25 ± 43.75
3	Symptoms	66.67 ± 19.63	66.67 ± 31.25
4	Effects of kidney disease	60.99 ± 25.80	59.38 ± 46.87
5	Total	54.87 ± 17.32	50.08 ± 25.69

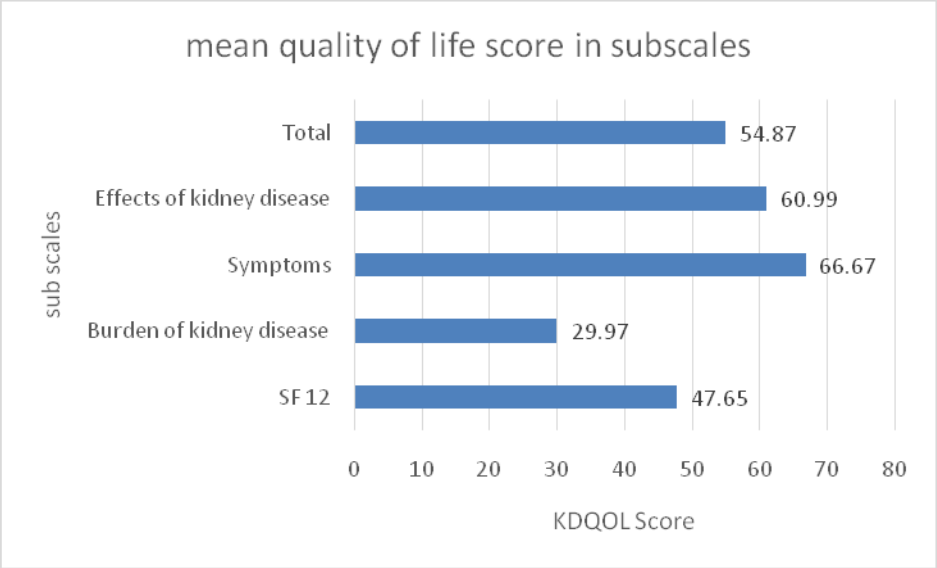

Figure 1: Mean quality of life score in subscales

The mean quality of life scores in subscales of KDQOL 36 questionnaire was shown in Table 9, Figure 1. In this study Kidney Disease Quality of Life – 36 (KDQOL – 36) scale which contains 4 subscales, is used to assess the quality of life in patients with chronic kidney disease. Scores are reported as mean ± standard deviation and median ± interquartile range. The SF12 subscale shows moderate scores, while burden of kidney disease scores exhibits higher variability. Symptoms and effects of kidney disease subscales reflect significant impact on quality of life. The total score combines these subscales for an overall assessment. These findings were comparable to *Modi GK et al*, where the quality of life is being measured using these subscales and the study have shown a significant decrease in burden of kidney disease score

Table no10: Quality of life scores in stages of chronic kidney disease

S.No	Subscales	Quality of life Scores					
		Stage III		Stage IV		Stage V	
		Mean	Median	Mean	Median	Mean	Median
1	SF 12	63.19	58.75	52.26	51.67	43.27	45
2	Burden of kidney disease	45.83	50	49.70	43.75	20.67	12.5
3	Symptoms	82.38	78.41	86.78	87.5	57.55	56.25
4	Effects of kidney disease	90.36	95.31	81.69	84.38	49.06	43.75
5	Total	73.44	72.99	69.99	70	46.68	47.36

Table 10, Figure 2 summarizes the mean and median scores for quality of life subscales among CKD patients categorized by disease stages (III, IV, and V). Stage III CKD patients exhibited the highest scores , particularly in symptoms and effects of kidney disease subscales, whereas stage V CKD patients had the lowest scores across all subscales. These findings compel with *Rydén A et al*; 2022, where they compared between chronic kidney disease patients, their result revealed decreased quality of life in CKD stage V patients while compared to other stages.

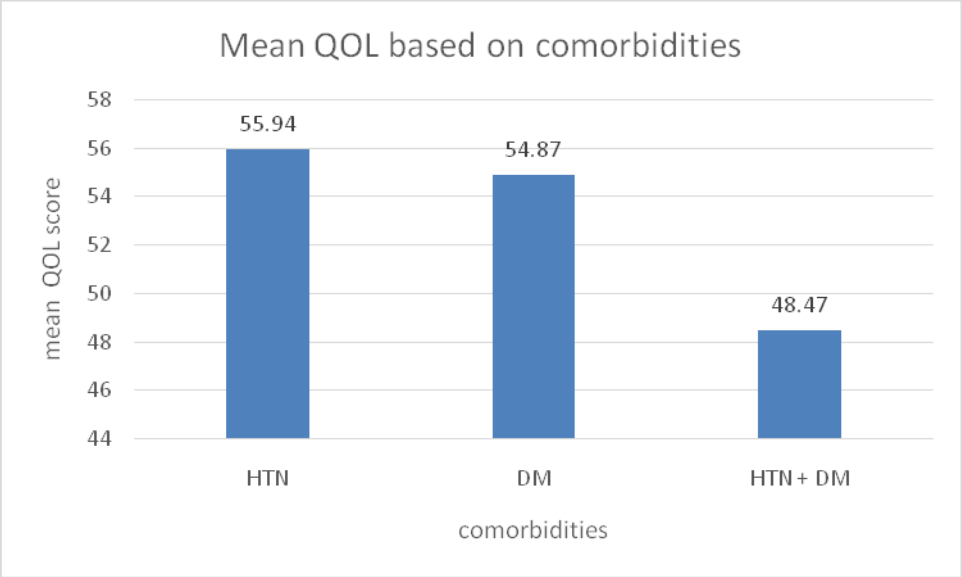

Figure 3: Distribution of quality of life based on co morbidities.

Table no11: Distribution of mean quality of life scores in sample population based on gender

S.No	KDQOL Score	Males (n=259)		Females(n=202)	
		Mean	Median	Mean	Median
1.	SF 12	47.65	49.17	48.29	49.17
2.	Burden of kidney disease	29.97	25	31.17	25
3.	Symptoms	66.76	66.67	68.88	68.46
4.	Effects of kidney disease	60.99	59.38	62.72	64.06
5.	Total score	54.87	50.08	56.30	51.52

Table no: 11, presents quality of life scores categorized by gender. There were no significant differences observed in scores between males and females across all subscales. Both genders shown similar levels of quality of life.

Table no 12: Comparison between stage III and Stage V of CKD **on quality of life scores**

S.No	Subscales	Total		P values
		Stage III	Stage V	
1	SF 12	58.75	45	0.00037
2	Burden of kidney disease	50	12.5	< 0.05
3	Symptoms	78.41	56.25	< 0.00001
4	Effects of kidney disease	95.31	43.75	< 0.05

Table no 12, Presents quality of life scores by stages of chronic kidney disease along with the associated p-values from Mann – Whitney U tests comparing stage III vs V CKD patients. Significant differences ($p<0.05$) were observed in SF12, Burden of kidney disease, Symptoms, Effects of kidney disease scores for stage III vs Stage V comparison.

4. DISCUSSION

The present study shows higher number of patients with CKD under dialysis has males (56%) were more than females (43.8%) respectively. Similar results were observed in a study conducted by Lewandowski MJ et al in 2019 at Austria and in a study by Hecking M, et.al 2014. The study results are compatible with the study conducted by Maria Pauly (2020) which shows that majority of the members 306(66.6%) are in stage 5 and on dialysis. Similar results were observed in our study which matches with study conducted by Murdeshwar HN et.al (2023).

Similar results were found as in a study on literacy levels by Parameswaran 2022 where most of them are graduated. Inspite of the education we can see many people in this study with stage 5 under dialysis. This depicts that, not only education but there are other factors which have a positive impact on patient's quality of life. Being married and financial independence helped subjects to manage similar to our study correlates with the study results of DePasquale N(2019) and undergo treatment like dialysis which is a highly costly affair which is also mentioned in Khanna U(2009).Since this is the last step in the management of kidney disease apart from kidney transplantation, patient is dependent on care taker or a supporting family. Joshi VD. 2014 concluded that patients having a supportive family, providing good nutrition and proper care about treatment schedules and patient's wellbeing, patient have good score on

mental composite score. Similar findings were observed in our study too. These findings were comparable to *Modi GK et al(*2020), where the quality of life is being measured using these subscales and the study have shown a significant decrease in burden of kidney disease score. Women have lower HRQoL scores than men on all indexes prior to adjustment. Adjusting for age, race, marital status, education and income reduced but did not remove the gender differences, except with HUI3. Adjusting for marital status or income had the largest impact on estimated gender differences Dasha Cherepanov(2010). Patients on hemodialysis therapy are at high risk of malnutrition which is attributed to multiple factors. Protein-energy malnutrition in these patients confers poor clinical outcomes Bramania P (2021). The mean difference for PCS and MCS based on CKD stages was found to be statistically significant ($p < 0.005$). End-stage renal disease patients scored lower on the HRQoL scale than the general population similar findings have been observed in a study conducted by Unruh M et.al. (2004). Mental dimensions of cognitive function, the role of emotional health, patient satisfaction, quality of social interaction, social support, dialysis staff encouragement, emotional well-being, and social function are generally combined to generate a mental composite summary (MCS) . Similar results were found in study conducted by Sharma S (2023). As the number of co morbidities increases with the duration, onset of CKD and its progression at a faster pace. Similar results have been observed in a study conducted by Singh (2013).

5. CONCLUSION

Gender, level of education has no significant effect on the KD-QOL scores. Poor nutrition level has been observed in the stage 5. People with Hypertension and Diabetes are to be screened for the early detection of CKD. Management and regulation of co morbidities has an positive correlation in the progression of CKD.

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