OPEN ACCESS
Saudi Journal of Biomedical Research
Abbreviated Key Title: Saudi J Biomed Res
ISSN 2518-3214 (Print) |ISSN 2518-3222 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Quality of Life Assessment in Patients of Stage V Chronic Kidney Disease

Dr. Md. Hedayetul Islam[1*], Dr. Nahid Sultana[1], Professor Dr. Md Abul Mansur[1], Dr. Gulzar Hossain[1], Dr. Mehefuz-E-Khoda[1], Dr. Rafi Nazrul Islam[1], Dr. Hasan-Ul Kabir[1], Dr. Ahmed Sharif Sumon[1]

[1]BIRDEM General Hospital, Dhaka, Bangladesh

DOI: 10.36348/sjbr.2022.v07i11.001 | **Received:** 16.09.2022 | **Accepted:** 24.10.2022 | **Published:** 03.11.2022

***Corresponding author:** Dr. Md. Hedayetul Islam
Department of Nephrology and Dialysis, Transplant Unit, BIRDEM General Hospital, Dhaka, Bangladesh

Abstract

Introduction: Despite ongoing advances in the treatment of chronic kidney disease (CKD), the mortality rate, and level of health-related quality of life (HRQOL) for the CKD population remain significantly higher than for the general population. The importance of measuring end-stage renal failure (ESRF) patients' quality of life in relation to healthcare lies in not only providing absolute survival but also the quality of that survival. Due to cost constraints, the profile of chronic kidney disease patients and their treatment in Bangladesh is almost identical to that of India, with patients frequently requesting a reduction in the frequency of dialysis sessions, the use of less expensive dialyzers, dialyzer reuse, and the absence of erythropoietin therapy. Hence, augmenting the QOL may perhaps be a challenge and an observable fact of specific interest for renal healthcare teams. This study is intended to assess KDQOL among patients receiving hemodialysis for 8 hours, and 12 hours per week, patients receiving CAPD, and patients of CKD stage V who decline any form of renal replacement therapy, and remained on conservative treatment. The aim of the study was to assess the quality of life among patients of CKD Stage V. ***Methods:*** This cross-sectional study was carried out at the Department of Nephrology, Dhaka Medical College Hospital and BIRDEM general hospital. The patients who received consultation at the Outdoor Department of selected hospital from November 2010 to October 2011. The study assess the of Quality of Life, and Cost Effectiveness on different modalities of treatment among the patients of chronic kidney disease stage V, and also to find out the best modality of dialysis. A total number of 134 consecutive patients were enrolled in this study, out of which 42 patients who were advised to commence renal replacement therapy, and after counseling opted to remain in conservative treatment were considered as GROUP I, 39 patients who received hemodialysis 8 hours per week were considered as GROUP II, 30 patients who received hemodialysis 12 hours per week in one or more centers were considered as GROUP III, and 23 patients who received Continuous Peritoneal Dialysis at least 3 exchanges per day were considered as GROUP IV. ***Result:*** Mean age was almost similar in all four groups, and most of the patients were 5th decade, and above. Male was predominant in all four groups, and the male-female ratio was almost 2:1 in the whole study patients. Diabetic nephropathy and glomerulonephritis were more common etiology of CKD in all four groups. Monthly expenditure was significantly ($p<0.05$) higher in group IV, followed by group III, group II, and group I in all three follow-ups, however, monthly expenditure was almost similar between group III, and group IV ($p>0.05$) but the mean monthly expenditure was higher in group IV patients. Mean serum Creatinine was lowest in group IV followed by group III, group II, and group I in descending order. Serum albumin was low in all the groups but almost parallel in all follow-ups in group II, groups I, and group IV, whereas the lowest was in group II followed by group I and group IV, but declined in group III during the 2nd, and 3rd follow-up from 1st follow-up. Hemoglobin level consistently remained within the target range in group IV in all follow-ups but below the target range in group I followed by group II, and group III in ascending order. The physical component score increased significantly in Group III, and Group IV at consecutive follow-ups, however, it was higher in Group IV. Similarly, the mental component score was recorded highest in Group IV, followed by group III, group II, and group I. Regarding mortality, it was observed that more than half of the patients were expired in group I, one-third in group II, and 16.7% in group III, and only 8.7% in group IV during final follow-up. ***Conclusion:*** Patients receiving continuous ambulatory peritoneal dialysis achieved the best clinical parameters in terms of control of blood pressure, and volume overload. On the other hand, parameters were a lot away from the desired target in patients receiving hemodialysis for 8 hours per week, and they did not have significantly better parameters in comparison to those who were only on conservative treatment. The scenario of serum albumin, and serum creatinine, though complicated by the existence of malnutrition, were in best approximation to the desired level in these

patients. According to the age-sex-matched risk categorization of the patients, it was found that the majority of patients on conservative treatment were in more than the average risk category.

Keywords: Kidney, Renal, Quality of Life, Hemodialysis.

INTRODUCTION

Chronic kidney disease (CKD) has a wide range of physical manifestations that affect every organ system, and range in severity from minor inconvenience to life-threatening, and they all have a negative impact on a patient's lifestyle [1-3]. Patients with CKD face dietary restrictions, time constraints, and often overwhelming physical, and psychological restrictions, which can cause disruptions in personal relationships, and social withdrawal [3-5]. The availability of various renal replacement therapies (RRT) has reduced the severity of symptoms and resulted in longer survival of CKD patients [6]. Different studies have shown that kidney transplantation is the accepted optimal form of renal replacement therapy that provides patients with CKD with the best quality of life, and also the best prognosis for survival [7-10]. Despite this, Canadian Institute for Health Information [11], and US Health Institute [12], published a renal registry showing a rapid rise in the incidence of CKD in the United States, and other countries, and the very long waiting list for transplantation. Most patients with CKD will require some form of dialysis during their lifetime. Hemodialysis, peritoneal dialysis, and kidney transplantation are miracles of medical technology, and the ability of these technologies to sustain lives is of unquestioned significance. Kutner *et al.,* in their study, emphasized that medical effectiveness is increasingly viewed from multiple perspectives that include more than patients' survival rates, and clinical outcomes [13]. Patient's functional status, well-being, and satisfaction along with treatment costs also determine the effectiveness of care. Multiple studies documented that hemodialysis, which is time-intensive, expensive, and requires fluid, and dietary restrictions, in long term often results in a loss of freedom, dependence on caregivers, disruption of marital, family, and social life, and reduced or loss of financial income [14, 15]. Due to these reasons, the physical, psychological, socioeconomic, and environmental aspects of life are negatively affected, leading to compromised quality of life. Quality of life issues are now recognized as important outcome measures in health care, cost-effective analyses of the efficacy of medical care, clinical trials, and therapeutic interventions for chronic conditions, including CKD. With the increased incidence of CKD worldwide due to an aging world population, and the increasing prevalence of co-morbid diseases [16-19], the demand for renal replacement therapy (RRT) is also on the rise. Quality of life also factors in the decision-making process for dialysis treatment selection [20]. Defining quality of life is complex as it can encompass a wide range of factors including psychological, cognitive, social, economic, political, cultural, spiritual, and physical factors [21]. The present study used the Kidney Disease Quality of Life-36 (KDQOL-36) survey by Lopes *et al.,* [22] along with the scoring system of Hays *et al.,* [23] to better understand and assess the quality of life among stage V CKD patients.

OBJECTIVE

General Objective

- To assess the quality of life among patients of CKD Stage V.

Specific Objectives

- To study the demographic profile of the study participants.

METHODS

This cross-sectional study was carried out at the Department of Nephrology, Dhaka Medical College Hospital and BIRDEM general hospital. The patients who received consultation at the Outdoor Department of selected hospital from November 2010 to October 2011. The study assess the of Quality of Life, and Cost Effectiveness on different modalities of treatment among the patients of chronic kidney disease stage V, and also to find out the best modality of dialysis. A total of 134 patients following the inclusion, and exclusion criteria, and was further divided into 4 groups following group-specific criteria. The study included only patients who had chronic kidney disease stage V and were advised to commence renal replacement therapy or on dialysis for at least 3 months. The patients who were advised for commencing renal replacement therapy, and after counseling opted to remain in conservative treatment and were considered as GROUP I. The patients who received hemodialysis 8 hours per week were considered as GROUP II. The patients who received hemodialysis 12 hours per week in one or more centers were considered as GROUP III., and, the patients who received Continuous Ambulatory Peritoneal Dialysis at least 3 exchanges per day were considered GROUP IV. Informed written consent was obtained from each of the participants, and ethical approval regarding the study was also obtained from the ethical review committee of the study hospital. Data was collected using the Kidney Disease Quality Of Life-36 (KDQOL-36) survey [22]. Following the collected data, the Scoring system of Hays *et al.,* was used to put KDQOL inputs into number format [23]. Statistical analyses of the results were obtained by using window-based computer software devised with Statistical Packages for Social Sciences (SPSS-16). Categorical data were presented as frequency, percentage, and the continuous variable was expressed as Mean±SD (standard deviation), and presented in tables, figures, and scatter diagrams. For statistical

analysis, continuous variables were analyzed by unpaired t-test, ANOVA, and categorical data was analyzed by χ^2 test (Chi-square test), and Pearson's correlation coefficient was used. A 'p-value of <0.05 was considered significant.

Inclusion Criteria

- Patients who were diagnosed as a case of CKD stage V, and after appropriate counseling regarding renal replacement therapy have opted for conservative treatment.
- Patients getting hemodialysis for at least 3 months for 8 hours per week in one center.
- Patients getting hemodialysis for at least 3 months for 12 hours per week in one or more than one center.
- Patients getting CAPD for at least 3 months at least 3 exchanges per 24 hours, and under regular follow-up at one of the study places.
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Patients who were compelled to a choice of certain forms of renal replacement therapy on medical ground.
- Patients admitted to the hospital for any acute illness that can hamper their quality of daily life.
- Those who could not complete a KDQOL-36 due to cognitive impairment, dementia, or active psychosis.
- Patients on dialysis for less than 3 months.
- Patients who refused to complete the KDQOL-36.
- Exclude those affected with other chronic diseases etc.

RESULTS

Table 1: Distribution of the study participants by various social characteristics

Variable	Group I (n=42)		Group II (n=39)		Group III (n=30)		Group IV (n=23)		P-value
	n	%	n	%	n	%	n	%	
Age in Years									
<20	1	2.4	0	0	0	0	0	0	N.A
21-30	7	16.7	7	17.9	3	10	0	0	
31-40	7	16.7	4	10.3	6	20	0	0	
41-50	8	19	15	38.5	9	30	8	34.8	
51-60	11	26.2	10	25.6	5	16.7	14	60.9	
61-70	5	11.9	2	5.1	6	20	0	0	
71-80	2	4.8	1	2.6	1	3.3	1	4.3	
>80	1	2.4	0	0	0	0	0	0	
Mean ± SD	48.14±16		46.28±12.11		48.07±12.43		53.576 ±7.1		0.130ns
Range (min-max)	(18-82)		(23-75)		(25-71)		(43-75)		
Gender									
Male	27	64.3	30	76.9	20	66.7	14	60.9	0.521ns
Female	15	35.7	9	23.1	10	33.3	9	39.1	
Marital Status									
Married	37	88.1	34	87.2	29	96.7	23	100	0.182ns
Unmarried	5	11.9	5	12.8	1	3.3	0	0	
Education									
Up to Primary	26	61.9	11	28.2	5	16.7	3	13	N.A
Up to H.S.C	11	26.2	16	41	8	26.7	3	13	
Up to graduation	5	11.9	3	7.7	10	33.3	10	43.5	
Above graduation	0	0	9	23.1	7	23.3	7	30.4	
Income									
<5000	19	45.2	7	17.9	2	6.7	0	0	<0.001s
5000-10000	16	38.1	9	23.1	4	13.3	0	0	
10001-20000	3	7.1	12	30.8	7	23.3	8	34.8	
20001-50000	4	9.5	10	25.6	11	36.7	9	39.1	
>50000	0	0	1	2.6	6	20	6	26.1	

The age of the study patients was divided into eight age groups, and the mean ± SD was 48.14± 16 years in group I, 46.28±12.11 years in group II, 48.07±12.43 years in group III, and 53.57±7.16 years in group IV. The mean age difference was not statically significant (p>0.05) among the groups in the ANOVA test. Male predominance was observed in all groups. 27(64.3%) in group I, 30(76.9%) in group II, 20(66.7%)

in group III, and 14(60.9%) in group IV were male. Besides, the male-female ratio was 2.1:1 in the whole study. The sex difference was not statistically significant (p>0.05) among the groups in the chi-square test. The majority of the study patients were married in all groups which were 37(88.1%) in group I, 34(87.2%) in group II, 29(96.7%) in group III, and 23(100.0%) in group IV. No significance (p>0.05) was observed regarding marital status among the groups in the chi-square test. The majority 26(61.9%), and 16(41.0%) of the study patients in group I, and group II studied up to the primary level, and H.S.C respectively. On the other hand, most 10(33.3%), and 10(43.5%) of the study patients studied up to graduation in group III, and group IV respectively. The monthly income of the study patients was divided into five income groups, and it was observed that the majority 19(45.2%) in group I had a monthly income <5000 tk and 12(30.8%) in group II had between 5000 to 10000 tk monthly income. However, most 11(36.7%), and 9(39.1%) of the study patients had 20001 to 50000 tk monthly income in between group III, and group IV respectively. The monthly income difference was statistically significant (p<0.05) in the chi-square test.

Table 2: Distribution of participants by etiology of chronic kidney disease

Etiology of CKD	Group I (n=42)		Group II (n=39)		Group III (n=30)		Group IV (n=23)	
	n	%	n	%	n	%	n	%
Glomerulonephritis	12	28.5	17	43.6	8	26.7	5	21.8
Diabetic Nephropathy	16	38.1	16	41	16	53.3	16	69.6
Polycystic kidney disease	1	2.4	2	5.1	2	6.7	0	0
Obstructive kidney disease	8	19	1	2.6	1	3.3	0	0
Hypertensive kidney disease	2	4.8	1	2.6	2	6.7	1	4.3
Unknown	3	7.2	2	5.2	1	3.3	1	4.3

Glomerulonephritis and Diabetic Nephropathy were observed as predominant factors of the etiology of CKD. However, the majority 16(38.1%), 16(53.3%), and 16(69.6%) of the study patients had diabetic kidney disease in group I, group III, and group IV. Moreover, Glomerulonephritis was observed mostly 18(46.2%) in group II.

Table 3: Distribution of participants according to to mean monthly expenditure in taka at different follow-ups

Monthly Expenditure	Group I (n=42)	Group II (n=39)	Group III (n=30)	Group IV (n=23)
	Mean±SD	Mean±SD	Mean±SD	Mean±SD
1st Follow-up	9497.6±7352.7	24491.0±12751.2	40883.3±12286.6	43821.7±6476.1
Range (min-max)	(1600-40000)	(7200-51700)	(9500-65000)	(33500-60000)
2nd Follow-up	9792.8±5434.5	25784.4±11098.9	42076.9±9688.8	44952.4±4165.0
Range (min-max)	(3500-25000)	(12000-54000)	(100-63000)	(41000-57000)
3rd Follow-up	9150±5125.0	28809.2±12403.5	40588±13148.8	45928.6±4231.7
Range (min-max)	(3500-25000)	(12000-54000)	(100-63000)	(1000-7000)

During the first follow-up, the mean±SD monthly expenditure was 9497.6±7352.7 tk per month in group I, 24491.0±12751.2 tk per month in group II, 40883.3±12286.6 tk per month in group III, and 43821.7±6476.1 tk per month in group IV. At the second follow-up, the mean±SD monthly expenditure was 9792.8±5434.5 tk per month in group I, 25784.4±11098.1 tk per month in group II, 42076.9±9688.8 tk per month in group III, and 44952.38±4165.05 tk per month in group IV. At the third follow-up, the mean±SD monthly expenditure was 9150±5125.02 tk per month in group I, 28809.2±12403.5 tk per month in group II, 40588±13148.9 tk per month in group III, and 45928.6±4231.7 tk per month in group IV.

Table 4: Follow-up comparison of mean monthly expenditure of the study patients in different groups

Comparison between Groups	1st follow up	2nd follow up	3rd follow up
	P value	P value	P value
Group I vs. group II	0.001s	0.000s	0.001s
Group II vs. group III	0.001s	0.000s	0.002s
Group II vs. group IV	0.001s	0.000s	0.001s
Group III vs. group IV	0.303ns	0.189ns	0.067ns

During the first follow-up, statistical analysis between group I vs. group II, group II vs. group III, and group II vs. group IV showed a significant (p<0.05) difference but group III vs. group IV was not statistically significant (p>0.05) in unpaired t-test. At the second follow-up, statistical analysis between group I vs. group II, group II vs. group III, and group II vs. group IV showed a significant (p<0.05) difference but

group III vs. group IV was not statistically significant (p>0.05) in unpaired t-test. At the third follow-up, Statistical analysis between group I vs. group II, group II vs. group III, and group II vs. group IV showed a significant (p<0.05) difference but group III vs. group IV was not statistically significant (p>0.05) in unpaired t-test.

Table 5: Distribution of participants according to to mean Blood pressure (mm/Hg) at different follow-ups (n=134)

Blood Pressure	Group I (n=42)	Group II (n=39)	Group III (n=30)	Group IV (n=23)
	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Systolic				
1st Follow-up	169±28	172±19	149±22	140±15
Range (min-max)	(100-220)	(130-220)	(110-220)	(90-170)
2nd Follow-up	177±36	170±19	145±19	137±8
Range (min-max)	(110-220)	(130-210)	(120-200)	(120-150)
3rd Follow-up	179±37	164±17	139±17	132±7
Range (min-max)	(100-220)	(130-200)	(120-200)	(120-150)
Diastole				
1st Follow-up	103±17	105±14	96±15	90±6
Range (min-max)	(60-140)	(60-120)	(70-140)	(70-100)
2nd Follow-up	108±22	107±13	92±12.7	86±5
Range (min-max)	(60-140)	(80-140)	(80-130)	(80-100)
3rd Follow-up	108±21	101±11	87±9	83±3
Range (min-max)	(60-140)	(80-120)	(70-100)	(80-90)

During the first follow-up, the mean±SD SBP was 169±28 mmHg ranging from 100 to 220 mmHg in group I, 172±19 mmHg ranging from 130 to 220 mmHg in group II, 149±22 mmHg ranging from 110 to 220 mmHg in group III, and 149±15 mmHg ranging from 90 to 170 mmHg in group IV. At the second follow-up, the mean±SD SBP was recorded 177±36 mmHg ranging from 110 to 220 mmHg in group I, 170±19 mmHg ranging from 130 to 210 mmHg in group II, 145±19 mmHg ranging from 120 to 200 mmHg in group III, and 137±8 mmHg ranging from 120 to 150 mmHg in group IV. At the third follow-up, the mean±SD SBP was observed 179±37 mmHg ranging from 100 to 220 mmHg in group I, 164±17 mmHg ranging from 130 to 200 mmHg in group II, 139±17 mmHg ranging from 120 to 200 mmHg in group III, and 132±7 mmHg ranging from 120 to 150 mmHg in group IV. For diastolic blood pressure, During the first follow-up, the mean±SD DBP was 103±17 mmHg ranging from 60 to 140 mmHg in group I, 105±14 mmHg ranging from 60 to 120 mmHg in group II, 96±15 mmHg ranging from 70 to 140 mmHg in group III, and 90±6 mmHg ranging from 70 to 100 mmHg in group IV. At the second follow-up, the mean±SD DBP was recorded 108±22 mmHg ranging from 60 to 140 mmHg in group I, 107±13 mmHg ranging from 80 to 140 mmHg in group II, 92±12 mmHg ranging from 80 to 130 mmHg in group III, and 86±5 mmHg ranging from 80 to 100 mmHg in group IV. At the third follow-up, the mean±SD DBP was observed 108±21 mmHg ranging from 60 to 140 mmHg in group I, 101±11 mmHg ranging from 80 to 120 mmHg in group II, 87±9 mmHg ranging from 70 to 100 mmHg in group III, and 83±3 mmHg ranging from 80 to 90 mmHg in group IV.

Table 6: Follow-up comparison of mean blood pressure of the study patients in different groups (n=134)

Comparison between Groups	1st follow up	2nd follow up	3rd follow up
	P value	P value	P value
Systolic			
Group I vs. group II	0.610ns	0.334ns	0.072ns
Group II vs. group III	0.001s	0.001s	0.001s
Group II vs. group IV	0.001 s	0.001s	0.001s
Group III vs. group IV	0.098ns	0.069ns	0.116ns
Diastolic			
Group I vs. group II	0.663ns	0.766ns	0.192ns
Group II vs. group III	0.016s	0.001s	0.001s
Group II vs. group IV	0.001s	0.001s	0.001s
Group III vs. group IV	0.081ns	0.066ns	0.074ns

In regards to systolic blood pressure, during the first follow-up, statistical analysis between group I vs group II showed no significant (p>0.05) difference, group II vs. group III & group II vs. group IV significant (p<0.05) difference, and group III vs. group IV showed not significant (p>0.05) in unpaired t-test.

During the second follow-up, statistical analysis between group I vs. group II showed no significant (p>0.05) difference, group II vs. group III & group II vs. group IV significant (p<0.05) difference, and group III vs. group IV showed no significant (p>0.05) difference in unpaired t-test. During the third follow-up, Statistical analysis between group I vs. group II showed no significant (p>0.05) difference, group II vs. group III & group II vs. group IV significant (p<0.05) difference, and group III vs. group IV showed no significant (p>0.05) in unpaired t-test. In regards to diastolic blood pressure, during the first follow- up, statistical analysis between group I vs. group II showed no significant (p>0.05) difference, group II vs. group III & group II vs. group IV significant (p<0.05) difference and group III vs. group IV showed not significant (p>0.05) in unpaired t-test. At the second follow-up, statistical analysis between group I vs. group II showed no significant (p>0.05) difference, group II vs. group III & group II vs. group IV significant (p<0.05) difference, and group III vs. group IV showed no significant (p>0.05) in unpaired t-test. At the third follow-up, statistical analysis between group I vs. group II showed no significant (p>0.05) difference, group II vs. group III & group II vs. group IV significant (p<0.05) difference, and group III vs. group IV showed no significant (p>0.05) in unpaired t-test.

Table 7: Mean distribution of the study patients according to Serum Levels (n=134)

Variable	Group I (n=42)	Group II (n=39)	Group III (n=30)	Group IV (n=23)
	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Serum Creatinine				
1st Follow-up	10.96±3.54	9.28±1.64	8.84±1.36	7.4±1.33
Range (min-max)	(5.3-22)	(6.2-13.5)	(6.2-12.2)	(3.4-8.9)
2nd Follow-up	11.26±2.11	9.34±1.74	8.55±1.31	7.15±0.95
Range (min-max)	(7.6-16.2)	(6.1-12.7)	(6.2-11.2)	(5.2-8.5)
3rd Follow-up	12.77±2.79	8.85±1.47	8.24±1.09	6.84±0.87
Range (min-max)	(8.4-19.2)	(6.7-13.2)	(6.7-11.2)	(5.4-8.4)
Serum Albumin				
1st Follow-up	28.9±5.5	27.36±4.0	30.4±4.8	29.6±2.5
Range (min-max)	(20-31)	(11.2-34)	(22-38)	(24-34)
2nd Follow-up	28.2±2.4	27.53±3.2	27.2±4.7	30.29±1.7
Range (min-max)	(19-28)	(22-34)	(10.6-36)	(28-34)
3rd Follow-up	28.3±2.1	27.1±3.2	28.52±3.5	29.98±4.8
Range (min-max)	(20-26)	(22-34)	(22-36)	(10.6-34)
Serum Hemoglobin				
1st Follow-up	8.0±1.7	9.3±4.2	9.8±1.2	11.6±1.0
Range (min-max)	(4.9-12.1)	(6.2-34)	(6.1-12)	(7.8-12.4)
2nd Follow-up	8.3±1.4	8.8±1.3	9.2±3.8	11±0.7
Range (min-max)	(5.9-11.6)	(6.2-11.6)	(7.6-28)	(9.012.1)
3rd Follow-up	7.8±1.2	8.3±1.3	9.7±1.3	12.4±1.5
Range (min-max)	(6.2-11.2)	(5.6-11.2)	(6.7-11.6)	(8.9-33)

During the first follow-up, the mean±SD Serum Creatinine was 10.96±3.54 mg/dl ranging from 5.3 – 22 in group I, 9.28±1.64 ranging from 6.2 – 13.5 in group II, 8.84±1.36 ranging from 6.2 –12.2 in group III, and 7.4±1.33 ranging from 3.4 – 8.9 in group IV. At the second follow-up, the mean±SD Serum Creatinine was 11.26±2.11 ranging from 7.6 – 21.1 in group I, 9.34±1.74 ranging from 6.1 – 12.7 in group II, 8.55±1.31 ranging from 6.2 – 11.2 in group III, and 7.15±0.95 ranging from 5.2 – 8.5 in group IV. At the third follow-up, the mean±SD Serum Creatinine was 12.77±2.79 ranging from 8.4 – 19.2 in group I, 8.85±1.47 ranging from 8.24 – 1.09 in group II, 8.24±1.09 ranging from 6.7 – 11.2 in group III, and 6.84±0.87 ranging from 5.4 – 8.4 in group IV.

During the first follow-up, the mean±SD serum albumin was 28.9±5.5 g/L in group I, 27.3±4.0 in group II, 30.4±4.8 in group III, and 29.6±2.5 in group IV. At the second follow-up, the mean±SD Serum albumin was 28.19±2.44 g/L ranging from 19 – 28 in group I, 27.5±3.3 in group II, 27.2±4.7 in group III, and 30.3±1.7 in group IV. At the third follow-up, the mean±SD serum albumin was 28.3±2.1 g/L in group I, 27.1±3.1 in group II, 28.5±3.5 in group III, and 29.1±4.8 in group IV.

During the first follow-up, the mean±SD hemoglobin level was 8.0±1.7 g/dl in group I, 9.3±4.2 in group II, 9.8±1.3 in group III, and 11.6±1 in group IV. At the second follow-up, the mean±SD hemoglobin level was 8.3±1.4 g/dL in group I, 8.8±1.3 in group II, 9.2±3.8 in group III, and 11±0.7 in group IV. At the third follow-up, the mean±SD hemoglobin level was 7.8±1.2 g/L in group I, 8.3±1.3 in group II, 9.7±1.3 in group III, and 12.4±1.5 in group IV.

Table 8: Follow-up comparison of mean serum levels of the study patients in different groups (n=134)

Comparison between Groups	1st follow up	2nd follow up	3rd follow up
	P value	P value	P value
Serum Creatinine			
Group I vs. group II	0.008s	0.001s	0.001s
Group II vs. group III	0.237ns	0.058ns	0.102ns
Group II vs. group IV	0.001s	0.001s	0.001s
Group III vs. group IV	0.001s	0.001s	0.001s
Serum Albumin			
Group I vs. group II	0.141ns	0.452ns	0.147ns
Group II vs. group III	0.005s	0.794ns	0.154ns
Group II vs. group IV	0.001s	0.001s	0.020s
Group III vs. group IV	0.510ns	0.008s	0.244ns
Serum Hemoglobin			
Group I vs. group II	0.083ns	0.154ns	0.124 ns
Group II vs. group III	0.574ns	0.486ns	0.001s
Group II vs. group IV	0.015s	0.001s	0.005s
Group III vs. group IV	0.001s	0.006s	0.001s

During the first follow-up, in terms of serum creatinine, statistical analysis between group I vs. group II, group II vs. group IV, and group III vs. group IV showed a significant ($p<0.05$) difference but group II vs. group III showed no significant ($p>0.05$) difference in unpaired t-test. During the second follow-up, in terms of serum creatinine, statistical analysis between group I vs. group II, group II vs. group IV, and group III vs. group IV showed a significant ($p<0.05$) difference but group II vs. group III showed no significant ($p>0.05$) difference in unpaired t-test. During the third follow-up, Statistical analysis between group I vs. group II, group II vs. group IV, and group III vs. group IV showed a significant ($p<0.05$) difference but group II vs. group III showed no significant ($p>0.05$) difference in unpaired t-test.

In terms of serum albumin, during the first follow-up, statistical analysis between group I vs. group II & group III vs. group IV showed no significant ($p>0.05$) difference but group II vs. group III & group II vs. group IV showed a significant ($p<0.05$) difference in unpaired t-test. At the second follow-up, statistical analysis between group I vs. group II & group II vs. group III showed no significant ($p>0.05$) difference but group II vs. group IV & group III vs. group IV showed a significant ($p<0.05$) difference in unpaired t-test. At the third follow-up, statistical analysis between group I vs. group II, group II vs. group III & group III vs. group IV showed no significant ($p>0.05$) difference but group II vs. group IV showed a significant ($p<0.05$) difference in unpaired t-test.

In regards to serum hemoglobin, during the first follow-up, statistical analysis between group I vs. group II & group II vs. group III showed no significant ($p>0.05$) difference but group II vs. group IV & group III vs. group IV showed a significant ($p<0.05$) difference in unpaired t-test. At the second follow-up, statistical analysis between group I vs. group II & group II vs. group III showed no significant ($p>0.05$) difference but group II vs. group IV & group III vs. group IV showed a significant ($p<0.05$) difference in unpaired t-test. At the third follow-up, Statistical analysis between group I vs. group II showed no significant ($p>0.05$) difference but group II vs. group III, group II vs. group IV & group III vs group IV showed a significant ($p<0.05$) difference in unpaired t-test.

Table 9: Mean distribution of the study patients according to physical, and mental component summary at different follow-ups (n=134)

Variable	Group I (n=42)	Group II (n=39)	Group III (n=30)	Group IV (n=23)
	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Physical component summary				
1st Follow-up	35.46±8.08	33.46±7.17	40.12±9.31	44.59±7.52
Range (min-max)	(21.6-56.8)	(20.2-45.7)	(25.7-58.1)	(25.1-57)
2nd Follow-up	34.47±6.33	35.84±6.66	44.2±8.34	48.28±4.38
Range (min-max)	(25.7-45.6)	(21.1-46.2)	(27.9-54.9)	(39.3-56.2)
3rd Follow-up	37.94±6.58	38.94±6.71	43.39±9.31	49.85±5.93
Range (min-max)	(28.7-51.7)	(21.7-46.3)	(30.3-58.9)	(28.4-55.7)
Mental component summary				
1st Follow-up	29.21±7.7	32.11±9.05	40.01±8.12	43.99±8.48
Range (min-max)	(17.1-43.2)	(19.3-57.3)	(24.4-52.8)	(22.8-67.4)
2nd Follow-up	33.11±8.62	37.61±9.56	41.93±10.59	46.62±5.62
Range (min-max)	(21.9-55.9)	(19.1-63.7)	(25.2-59.9)	(28.6-56.9)
3rd Follow-up	33.27±9.75	35.25±8.04	46.31±8.15	51.1±4.4
Range (min-max)	(19.1-50.5)	(16.5-56.3)	(29.4-57.4)	(33.3-55.2)

During the first follow-up, the mean±SD physical component was 35.46±8.08 ranging from 21.6 –56.8 in group I, 33.46±7.17 ranging from 20.2 – 45.7 in group II, 40.12±9.31 ranging from 25.7 – 58.1 in group III, and 44.59±7.52 ranging from 25.1 – 57 in group IV. At the second follow-up, the mean±SD physical component was 34.47±6.33 ranging from 25.7 – 45.6 in group I, 35.84±6.66 ranging from 21.1 – 46.2 in group II, 44.2±8.34 ranging from 27.9 – 54.9 in group III, and 48.28±4.38 ranging from 39.3 – 56.2 in group IV. At the third follow-up, the mean±SD physical component was 37.94±6.58 ranging from 28.7 – 51.7 in group I, 38.94±6.71 ranging from 21.7 – 46.3 in group II, 43.39±9.31 ranging from 30.3 – 58.9 in group III, and 49.85±5.93 ranging from 28.4 – 55.7 in group IV.

In terms of mental component summary, during the first follow-up, the mean±SD mental component was 29.21±7.7 ranging from 17.1 – 43.2 in group I, 32.11±9.05 ranging from 19.3 – 57.3 in group II, 40.01±8.12 ranging from 24.4 – 52.8 in group III, and 43.99±8.48 ranging from 22.8 – 67.4 in group IV. At the second follow-up, the mean±SD mental component was 33.11±8.62 ranging from 21.9 – 55.9 in group I, 37.61±9.56 ranging from 19.1 – 63.7 in group II, 41.93±10.59 ranging from 25.2 – 59.9 in group III, and 46.62±5.62 ranging from 28.6 – 59.9 in group IV. At the third follow-up, the mean±SD mental component was 33.27±9.75 ranging from 19.1 – 50.5 in group I, 35.25±8.04 ranging from 16.5 – 56.3 in group II, 46.31±8.15 ranging from 29.4 – 57.4 in group III, and 51.1±4.4 ranging from 33.3 – 55.2 in group IV.

Table 10: Follow-up comparison of mean physical, and mental component summary of the study patients in different groups (n=134)

Comparison between Groups	1st follow up	2nd follow up	3rd follow up
	P value	P value	P value
Physical component summary			
Group I vs. group II	0.243	0.345ns	0.500ns
Group II vs. group III	0.001s	0.000s	0.000s
Group II vs. group IV	0.000s	0.000s	0.000s
Group III vs. group IV	0.025s	0.049s	0.009s
Mental component summary			
Group I vs. group II	0.123ns	0.056ns	0.454ns
Group II vs. group III	0.001s	0.080ns	0.000s
Group II vs. group IV	0.001s	0.001s	0.000s
Group III vs. group IV	0.088ns	0.060ns	0.144ns

In terms of physical component summary, during the first follow-up, statistical analysis between group I vs. group II showed no significant ($p>0.05$) difference but group II vs. group III, group II vs. IV & group III vs. group IV showed significant ($p<0.05$) difference in unpaired t-test. During the second follow-up, statistical analysis between group I vs. group II showed no significant ($p>0.05$) difference but group II vs. group III, group II vs. IV & group III vs. group IV showed significant ($p<0.05$) difference in unpaired t-test. At the third follow-up, statistical analysis between group I vs. group II showed no significant ($p>0.05$) difference but group II vs. group III, group II vs. IV & group III vs. group IV showed a significant ($p<0.05$) difference in unpaired t-test.

In terms of mental component summary, during the first follow-up, statistical analysis between group I vs. group II & group III vs. group IV showed no significant ($p>0.05$) difference but group II vs group III & group II vs. group IV showed a significant ($p<0.05$) difference in unpaired t-test. At the second follow-up, statistical analysis between group I vs. group II, group II vs. group III & group III vs. group IV showed no significant ($p>0.05$) difference but group II vs. group IV showed a significant ($p<0.05$) difference in unpaired t-test. At the third follow-up, statistical analysis between group I vs. group II & group III vs. group IV showed no significant ($p>0.05$) difference but group II vs. group III & group II vs. group IV showed a significant ($p<0.05$) difference in unpaired t-test.

Table 11: Distribution of the study patients according to mortality at different follow-ups (n=134)

Mortality	Group I (n=42)		Group II (n=39)		Group III (n=30)		Group IV (n=23)	
	n	%	n	%	n	%	n	%
2nd Follow-up								
Alive	28	66.7	36	92.3	26	86.7	21	91.3
Death	14	33.3	3	7.7	4	13.3	2	8.7
3rd follow-up								
Alive	20	71.4	26	72.2	25	96.2	21	100
Death	8	28.6	10	27.8	1	3.8	0	0
Final Follow-up								
Alive	20	47.6	26	66.7	25	83.3	21	91.3
Death	22	52.4	13	33.3	5	16.7	2	8.7

The mortality among group I, group II, group III, and group IV were 14(33.3%), 3(7.7%), 4(13.3%), and 2(8.7%) respectively by 2nd follow-up. In 3rd follow up mortality among participants was 8(28.6%) in group I, 10(27.8%) in group II, 1(3.8%) in group III, and not found in group IV. In the final follow-up, mortality among group I, group II, group III, and group IV were 22(52.4%), 13(33.3%), 5(16.7%), and 2(8.7%) respectively.

Table 12: Follow-up comparison of mortality of the study patients in different groups (n=134)

Comparison group	2nd follow up	3rd follow up	Final follow up
	p value	p value	p value
Group I vs. group II	0.004 s	0.944ns	0.083ns
Group II vs. group III	0.441 ns	0.014s	0.118ns
Group II vs. group IV	0.888 ns	0.007s	0.028s
Group III vs. group IV	0.597 ns	0.363 ns	0.395ns

By the second follow-up, in regards to mortality among participants, statistical analysis between group I vs. group II showed a significant ($p<0.05$) difference but group II vs. group III, group II vs. group IV & group III vs. group IV showed not significant ($p>0.05$) difference in a chi-square test. At 3rd follow-up, statistical analysis between group I vs. group II & group III vs. group IV showed no significant ($p>0.05$) difference but group II vs. group III & group II vs. group IV showed a significant ($p<0.05$) difference in the chi-square test. By the final follow-up, statistical analysis between group I vs. group II, group II vs. group III & group III vs. group IV showed no significant ($p>0.05$) difference but group II vs. group IV showed a significant ($p<0.05$) difference in the chi-square test.

Table 13: Risk categorization of the study population according to quality of life (physical, and mental score) at different follow-ups (n=134)

Variable	Group I (n=42)		Group II (n=39)		Group III (n=30)		Group IV (n=23)		P-value
	n	%	n	%	n	%	n	%	
QOL (physical)									
1st follow up									
More than average risk	32	76.2	30	12.8	3	10	1	4.3	0.001s
Average risk	7	16.7	5	76.9	16	53.3	8	34.8	
Less than average risk	3	7.1	4	10.3	11	36.7	14	60.9	
Total	**42**	**100**	**39**	**100**	**30**	**100**	**23**	**100**	
2nd follow up									
More than average risk	25	89.3	31	8.3	2	7.7	1	4.8	0.001s
Average risk	3	10.7	3	86.1	7	26.9	14	66.7	
Less than average risk	0	0	2	5.6	17	65.4	6	28.6	
Total	**28**	**100**	**36**	**100**	**26**	**100**	**21**	**100**	
3rd Follow up									
More than average risk	16	80	12	48	12	48	0	0	0.001s
Average risk	4	20	12	48	10	40	15	71.4	
Less than average risk	0	0	1	4	3	12	6	28.6	
Total	**20**	**100**	**25**	**100**	**25**	**100**	**21**	**100**	
QOL (Mental)									
1st follow up									
More than average risk	28	66.7	12	30.8	8	26.7	1	4.3	0.001s
Average risk	14	33.3	27	69.2	16	73.3	10	87	
Less than average risk	0	0	0	0	6	0	12	8.7	
Total	**42**	**100**	**39**	**100**	**30**	**100**	**23**	**100**	
2nd follow up									
More than average risk	21	75	12	33.3	4	15.4	1	5	0.001s
Average risk	7	25	23	63.9	21	80.8	14	70	
Less than average risk	0	0	1	2.8	1	3.8	5	25	
Total	**28**	**100**	**36**	**100**	**26**	**100**	**20**	**100**	
3rd Follow up									
More than average risk	11	55	10	38.5	3	12	1	4.8	0.001s
Average risk	9	45	16	61.5	16	64	16	76.2	
Less than average risk	0	0	0	0	6	24	4	19	
Total	**20**	**100**	**26**	**100**	**25**	**100**	**21**	**100**	

In the current study, more than three fourth (76.2% to 89.2%) of the patients were categorized as more than average risk at all follow-ups in group I. Similarly, in group II, a majority (76.9%) at 1st follow-up, 86.1%, at 2nd follow-up, and 76.9% at 3rd follow-up) of the patients were in the average risk category at all follow-ups. In group III, more than a half (53.3%) of the patients were in the average risk category at 1st follow-up, nearly two third (65.4%) were less than the average risk category at 2nd follow-up but at the third follow-up, more than average risk, and average risk category personal were all most parallel, which was almost a half (48.0%). In group IV, a majority (60.9%) was less than the average risk category at 1st follow-up but at 2nd follow-up and the third follow-up, most of the patients were in the average risk category. Similarly, quality of life (mental) was observed that the majority of the group I patients were more than average risk category at all follow-ups (66.7% at 1st follow-up, 75.0%, at 2nd follow-up, and 55.0% at 3rd follow- up) in group I but group II, group III, and group IV patients were average risk category at all follow-up (61.5% to 87.0%).

DISCUSSION

This longitudinal study was carried out with an aim to assess the quality of life, and cost-effectiveness of different modalities of treatment among patients of chronic kidney disease stage V, and also to find out the best modality of dialysis. Among the total 134 patients selected for the present study, 42 patients who were advised for commencing renal replacement therapy, and after counseling opted to remain in conservative treatment were considered as GROUP I, 39 patients who received hemodialysis 8 hours per week were considered as GROUP II, 30 patients who received hemodialysis 12 hours per week in one or more centers were considered as GROUP III, and 23 patients who received Continuous Ambulatory Peritoneal Dialysis at least 3 exchanges per day were considered as GROUP IV. In this present study, it was observed that the mean ± SD age was 48.14± 16 years in group I, 46.28±12.11 years in group II, 48.07±12.43 years in group III, and 53.57±7.16 years in group IV, which were almost similar in all modalities of treatment, and a majority of the patients were in 5th, and 6th decade but under 5th-decade patients were not observed in group IV patients. Although the difference in mean ages among different treatment modalities was not significant in our studies, some studies observed a significant difference between patients on hemodialysis and patients on peritoneal dialysis [24]. The present study findings indicate that chronic kidney disease stage V is more common among male subjects, which was supported by the findings of other studies [24-26]. The monthly income of the participants had great significance with their treatment methodology. N this current study comparatively low-income groups (up to 10,000 Tk) were found in group I (83.3%) followed by 5000 to 20,000Tk in group II (53.9%). On the other hand, more than 20,000 TK income groups predominate in group III (56.7%), and group IV (65.2%). This correlation between income and treatment method was observed in other studies as well [27]. In this study, it was observed that diabetic nephropathy was found in 38.1% of group I, 43.6% in group II, 53.3% in group III, and 69.6% in group IV. Whereas glomerulonephritis was found at 35.7% in group I, 46.2% in group II, 30.0% in group III, and 26.1% in group IV, which were more common etiology of CKD in all four groups. However, the etiology of CKD can be greatly varied based on many factors, as observed in other studies [28, 29]. Regarding the monthly expenditure it was observed in this series that significantly ($p<0.05$) higher expenditure was found in group IV, followed by group III, group II, and group I in all three follow-ups, however, monthly expenditure was almost similar between group III, and group IV ($p>0.05$) but the mean monthly expenditure was higher in group IV patients. Among the participants, both systolic, and diastolic blood pressure consistently remained nearest to the target range (110-130mmHg) in group IV followed by group III, but in Group I, and Group II Blood pressure remained higher than the target range though it was not significantly ($p>0.05$) different between group I, and group II significantly ($p<0.05$) higher than Group III, and Group IV. However, group III, and group IV were not significantly ($p>0.05$) different. It was observed that mean serum creatinine was significantly different among all 3 follow-ups between all groups except group II vs group III, where it was not significantly different at any follow-ups. Mean serum albumin was low in all groups of this study. Group I vs II showed no significant difference at any follow- ups, while group II vs III showed a significant difference only at the first follow-up, with no significant difference at remaining follow-ups. The difference in mean serum albumin between groups II vs IV had significance at all follow-ups. In terms of mean serum hemoglobin, a significant difference was only observed at the third follow-up, between groups II vs III, and at all three follow-ups between groups II vs IV, and III vs IV. The mean serum levels of albumin, and creatinine were similar to the findings of other previous studies, and a possible explanation for this was the study being conducted on primarily malnourished patients [30]. In this current study it was further observed that the Hemoglobin level had consistently remained within the target range (11 – 12 mg/dl) in group IV in all follow-ups but far apart from the target range in group I followed by group II, and group III in ascending order. During the first follow-up, the mean±SD physical component was 40.12±9.31 in group III, and 44.59±7.52 in group IV ($p<0.05$). At the second follow- up, the mean±SD physical component was 44.2±8.34 in group III, and 48.28±4.38 in group IV ($p<0.05$). At the third follow-up, the mean±SD physical component was 43.39±9.31 in group III, and 49.85±5.93 in group IV ($p<0.05$). The above results revealed that the physical component score increased significantly in Group III, and Group IV at consecutive

follow-ups, however, it was higher in Group IV. The mean±SD mental component score was 40.01±8.12 in group III, and 43.99±8.48 in group IV during 1st follow-up, at the second follow-up, the mean±SD mental component score was 41.93±10.59, and 46.62±5.62 in group III, and group IV respectively, and at the third follow-up, the mean±SD mental component was 46.31±8.15 in group III, and 51.1±4.4 in group IV, thus were higher in group IV at all follow-ups, but two groups did not differ significantly. These mental component findings were similar to another previous study [25]. Regarding mortality, it was observed that more than half (52.4%) of the patients expired in group I, one-third (33.3%) in group II, 16.7% in group III, and only 8.7% in group IV during final follow-up. Research on Survival and quality of life among different modalities of dialysis revealed conflicting results all over the world. Korevaar *et al.*, observed no statistically significant difference in survival between hemodialysis, and peritoneal dialysis (P = 0.12) [31]. In another study, Bloembergen *et al.*, compared the mortality rate between patients treated with hemodialysis, and peritoneal dialysis, and found death rate was 19.0% higher for the peritoneal dialysis group compared with the hemodialysis group (RR=1.19; P<0.001) [32]. Among patients with cardiovascular disease, the risk for death was approximately twice as high in those undergoing peritoneal dialysis than in those undergoing hemodialysis. According to risk stratification recommended by the DOPPS study the Quality of life (physical) observed in this current study that more than three fourth (76.2% to 89.2%) of the patients were categorized in more than average risk at all follow-ups in group I. Similarly, in group II, a majority (76.9% at 1st follow-up, 86.1%, at 2nd follow-up, and 76.9% at 3rd follow-up) of the patients were in average risk category at all follow-up. In group III, more than a half (53.3%) of the patients were in the average risk category at 1st follow-up, nearly two third (65.4%) were less than average risk category at 2nd follow-up but at the third follow-up, more than average risk, and average risk category personal were all most parallel, which was almost a half (48.0%). In group IV, the majority (60.9%) was less than the average risk category at 1st follow-up but at 2nd follow-up and the third follow-up, most of the patients were in the average risk category. Similarly, quality of life (mental) was observed that the majority of the group I patients were more than average risk category at all follow-ups (66.7% at 1st follow-up, 75.0%, at 2nd follow-up, and 55.0% at 3rd follow-up) in group I but group II, group III, and group IV patients were average risk category at all follow-up (61.5% to 87.0%).

Limitations of the Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community. Comparison among hemodialysis patients was not done in the same center. The patients receiving CAPD taking 3 exchanges were included in the study, whereas for ideal peritoneal dialysis recommended exchange is at least 4 times a day.

CONCLUSION

This study revealed that patients receiving continuous ambulatory peritoneal dialysis achieved the best clinical parameters in terms of control of blood pressure, and volume overload followed by patients receiving hemodialysis for 12 hours per week. On the other hand, parameters were a lot away from the desired target in patients receiving hemodialysis for 8 hours per week, and they did not have significantly better parameters in comparison to those who were only on conservative treatment. Regarding biochemical parameters target hemoglobin was maintained only in continuous ambulatory peritoneal dialysis patients followed by patients receiving hemodialysis for 12 hours per week, and again patients receiving 8 hours per week of hemodialysis, and patients belonging to conservative treatment fall far out of the target range. The scenario of serum albumin, and serum creatinine, though complicated by the existence of malnutrition, were in best approximation to the desired level in continuous ambulatory peritoneal dialysis patients. All the domains of quality of life scored by KDQOL 36 were highest among continuous ambulatory peritoneal dialysis patients, followed by patients receiving hemodialysis for 12 hours per week, patients receiving 8 hours per week hemodialysis, and those on conservative treatment had worse quality of life score in comparison to other two groups, and more importantly 8 hours per week hemodialysis failed to show any improvement in QOL in comparison to conservative treatment at most domains of quality of life. as a result, according to age sex matched risk categorization of the patients in terms of physical component summary, and mental component summary, it was found majority of the patients on conservative treatment were in more than average risk category, and majority of the patients receiving 8 hours per week hemodialysis were in average risk category, while patients on hemodialysis for 12 hours per week were distributed almost evenly in between less than average risk category, and average risk category, on the contrary patients on CAPD was predominantly in less than average risk category. Mortality among conservative treatment was nearly half of the study population, and with 8 hours per week of hemodialysis, it was one-third. In the patients receiving 12 hours of hemodialysis, only one-fifth of patients expired while in the CAPD patients group had a mortality rate below one-tenth of the study population.

RECOMMENDATION

A larger study carried on different centers with hemodialysis of 8 hours per week, and 12 hours per week may be compared, and if similar findings are achieved, prescription for hemodialysis should strictly follow recommended 12 hours per week at government, and non-government hospitals. Continuous ambulatory

peritoneal dialysis is a better option of renal replacement therapy, provided expenditure is within the patients' ability. QOL score can predict mortality in patients with renal replacement therapy, a larger study can be undertaken to find out the cut off value of QOL score for our population, and it can be developed as a tool to monitor the health of dialysis patients at all centers.

FUNDING

No funding sources.

CONFLICT OF INTEREST

None declared.

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

REFERENCES

1. Hays, R. D. (1994). The medical outcomes study (mos) measures of patient adherence. *J Behav Med*, *17*, 361-7.
2. Kouidi, E. (2004). Health-related quality of life in end-stage renal disease patients: the effects of renal rehabilitation. *Clinical nephrology*, *61*, S60-71.
3. Mapes, D. L., Bragg-Gresham, J. L., Bommer, J., Fukuhara, S., McKevitt, P., Wikström, B., & Lopes, A. A. (2004). Health-related quality of life in the Dialysis Outcomes and Practice Patterns Study (DOPPS). *American Journal of Kidney Diseases*, *44*, 54-60.
4. Kurella, M., Luan, J., Yaffe, K., & Chertow, G. M. (2004). Validation of the Kidney Disease Quality of Life (KDQOL) cognitive function subscale. *Kidney international*, *66*(6), 2361-2367.
5. Vazquez, I., Valderrábano, F., Fort, J., Jofré, R., López-Gómez, J. M., Moreno, F., & Sanz-Guajardo, D. (2005). Psychosocial factors and health-related quality of life in hemodialysis patients. *Quality of Life Research*, *14*(1), 179-190.
6. Koda-Kimble, M. A., Hudson, J. Q., & Johnson, C. A. (2004). Chronic Kidney Disease. In: Applied therapeutics: The clinical use of Drugs. Philadelphia, Pa: *Lippincott Williams & Wilkins.*
7. Port, F. K., Wolfe, R. A., Mauger, E. A., Berling, D. P., & Jiang, K. (1993). Comparison of survival probabilities for dialysis patients vs cadaveric renal transplant recipients. *Jama*, *270*(11), 1339-1343.
8. Churchill, D. N., Torrance, G. W., Taylor, D. W., Barnes, C. C., Ludwin, D., Shimizu, A., & Smith, E. K. (1987). Measurement of quality of life in end-stage renal disease: the time trade-off approach. *Clinical and investigative medicine. Medecine clinique et experimentale*, *10*(1), 14-20.
9. Hart, L. G., & Evans, R. W. (1987). The functional status of ESRD patients as measured by the Sickness Impact Profile. *Journal of Chronic Diseases*, *40*, 117S-130S.
10. Bremer, B. A., McCauley, C. R., Wrona, R. M., & Johnson, J. P. (1989). Quality of life in end-stage renal disease: a reexamination. *American Journal of Kidney Diseases*, *13*(3), 200-209.
11. Arbus, G. S., Fenton, S. S., Fradet, G., Greig, P., Jeffery, J. R., Menkis, A., Copleston, P., & Desmeulus, M. (1995). Canadian Organ Replacement Register. 1993 Annual Report. Don Mills, Ontario: *Canadian Institute for Health Information.*
12. National Institutes of Health. (1997). U.S. Renal Data System 1997 Annual Data Report. not mentioned: National Institute of Diabetes, and Digestive, and Kidney Diseases.
13. Kutner, N. G. (1994). Assessing end-stage renal disease patients' functioning and wellbeing: measurement approaches and implications for clinical practice. *American Journal of Kidney Diseases*, *24*(2), 321-333.
14. Blake, C., Codd, M. B., Cassidy, A., & O'Meara, Y. M. (2000). Physical function, employment and quality of life in end-stage renal disease. *Journal of nephrology*, *13*(2), 142-149.
15. Lin, C. C., Lee, B. O., & Hicks, F. D. (2005). The phenomenology of deciding about hemodialysis among Taiwanese. *Western Journal of Nursing Research*, *27*(7), 915-929.
16. Jager, K. J., Van Dijk, P. C., Dekker, F. W., Stengel, B., Simpson, K., & Briggs, J. D. (2003). The epidemic of aging in renal replacement therapy: an update on elderly patients and their outcomes. *Clinical nephrology*, *60*(5), 352-360.
17. Stengel, B., Billon, S., Van Dijk, P. C., Jager, K. J., Dekker, F. W., Simpson, K., & Briggs, J. D. (2003). Trends in the incidence of renal replacement therapy for end-stage renal disease in Europe, 1990–1999. *Nephrology Dialysis Transplantation*, *18*(9), 1824-1833.
18. Lok, C. E., Oliver, M. J., Rothwell, D. M., & Hux, J. E. (2004). The growing volume of diabetes-related dialysis: a population based study. *Nephrology Dialysis Transplantation*, *19*(12), 3098-3103.
19. Kurella, M., Covinsky, K. E., Collins, A. J., & Chertow, G. M. (2007). Octogenarians and nonagenarians starting dialysis in the United States. *Annals of internal medicine*, *146*(3), 177-183.
20. Unruh, M. L., Weisbord, S. D., & Kimmel, P. L. (2005). Psychosocial factors in patients with chronic kidney disease: Health-related quality of life in nephrology research, and clinical practice. In *Seminars in dialysis*, 18(2), 82-90. Oxford, UK: Blackwell Science Inc.
21. Schipper, H. (1990). Definitions, and conceptual issues. *Quality of life assessment in clinical trials*, 11-24.
22. Lopes, A. A., Bragg-Gresham, J. L., Satayathum, S., McCullough, K., Pifer, T., Goodkin, D. A., ... & Worldwide DOPPS Committee. (2003). Health-

related quality of life and associated outcomes among hemodialysis patients of different ethnicities in the United States: the Dialysis Outcomes and Practice Patterns Study (DOPPS). *American Journal of Kidney Diseases*, *41*(3), 605-615.

23. Hays, R. D., Kallich, J. D., Mapes, D. L., Coons, S. J., & Carter, W. B. (1994). Development of the kidney disease quality of life (KDQOLTM) instrument. *Quality of life Research*, *3*(5), 329-338.
24. Jaar, B. G., Coresh, J., Plantinga, L. C., Fink, N. E., Klag, M. J., Levey, A. S., ... & Powe, N. R. (2005). Comparing the risk for death with peritoneal dialysis and hemodialysis in a national cohort of patients with chronic kidney disease. *Annals of internal medicine*, *143*(3), 174-183.
25. Wu, A. W., Fink, N. E., Marsh-Manzi, J. V., Meyer, K. B., Finkelstein, F. O., Chapman, M. M., & Powe, N. R. (2004). Changes in quality of life during hemodialysis and peritoneal dialysis treatment: generic and disease specific measures. *Journal of the American Society of Nephrology*, *15*(3), 743-753.
26. Wasserfallen, J. B., Halabi, G., Saudan, P., Perneger, T., Feldman, H. I., Martin, P. Y., & Wauters, J. P. (2004). Quality of life on chronic dialysis: comparison between haemodialysis and peritoneal dialysis. *Nephrology Dialysis Transplantation*, *19*(6), 1594-1599.
27. Sathvik, B. S., Parthasarathi, G., Narahari, M. G., & Gurudev, K. C. (2008). An assessment of the quality of life in hemodialysis patients using the WHOQOL-BREF questionnaire. *Indian journal of nephrology*, *18*(4), 141.
28. Zhang, A. H., Cheng, L. T., Zhu, N., Sun, L. H., & Wang, T. (2007). Comparison of quality of life and causes of hospitalization between hemodialysis and peritoneal dialysis patients in China. *Health and quality of life outcomes*, *5*(1), 1-6.
29. Mittal, S. K., Ahern, L., Flaster, E., Maesaka, J. K., & Fishbane, S. (2001). Self-assessed physical and mental function of haemodialysis patients. *Nephrology Dialysis Transplantation*, *16*(7), 1387-1394.
30. Kang, S. S., Chang, J. W., & Park, Y. (2017). Nutritional status predicts 10-year mortality in patients with end-stage renal disease on hemodialysis. *Nutrients*, *9*(4), 399.
31. Korevaar, J. C., Feith, G. W., Dekker, F. W., Van Manen, J. G., Boeschoten, E. W., Bossuyt, P. M., ... & NECOSAD Study Group. (2003). Effect of starting with hemodialysis compared with peritoneal dialysis in patients new on dialysis treatment: a randomized controlled trial. *Kidney international*, *64*(6), 2222-2228.
32. Bloembergen, W. E., Port, F. K., Mauger, E. A., & Wolfe, R. A. (1995). A comparison of mortality between patients treated with hemodialysis and peritoneal dialysis. *Journal of the American Society of Nephrology*, *6*(2), 177-183.