JOURNAL OF NATURAL REMEDIES
DOI: 10.18311/jnr/2025/48191
RESEARCH ARTICLE

Factors Associated with Health-Related Quality of Life in Chronic Kidney Disease Patients on Dialysis and Their Knowledge Towards *Ayush* System: A Cross-sectional Study in a Tertiary Care Hospital, Tripura, India

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Abstract

Background: Chronic Kidney Disease (CKD) is a progressive disease with irreversible loss in the functioning of kidneys developed over the years and is a major burden on society. **Aim:** The present study assesses the factors associated with health-related quality of life among CKD patients on dialysis and their knowledge of *Ayush* systems. **Methods:** This cross-sectional study was conducted on CKD patients undergoing hemodialysis and attending a dialysis unit in Tripura. Patients aged 18 years and above, having CKD and on dialysis, were enrolled. KDQOL was used to capture the Quality of Life (QoL). ANOVA and Odds ratios (univariate) with 95% Confidence Intervals (CI) were reported for factors associated with CKD. **Results:** 239 participants were studied (68.2% male and 31.8% female). The mean score of the Kidney Disease Component Summary (KDCS) was higher (55.90, ± 7.09) than the physical composite summary (38.23, ± 9.69) and the mental composite summary (34.03 ± 12.64). Unemployed participants (OR=2.61; 95% CI: 1.11-6.12) and homemakers (OR=4.32; 95% CI: 1.49-12.49) were considerably associated with poor QoL the KDCS domain. No variable was significantly related to the PCS and MCS domains. Only 14.2% of patients had taken any *Ayush* treatment for CKD. **Conclusion:** This study highlights poor quality of life among CKD patients on dialysis and poor knowledge towards the *Ayush* system for the treatment of CKD. Awareness and education at a policy level, and amongst stakeholders, are required for seeking an integrated approach with *Ayush* systems for the treatment of CKD to reduce the burden of dialysis and improve the quality of life.

Major Findings: The present work throws light on the poor quality of life among CKD patients on dialysis and poor knowledge towards the *Ayush* system for the treatment of CKD.

Keywords: *Ayush*, Chronic Kidney Disease (CKD), Dialysis, Quality of Life

1. Introduction

Chronic Kidney Disease (CKD) (ICD 10-N18) is a slow, progressive, non-communicable illness with irreversible loss in the functioning of kidneys that usually develops over years[1]. The Glomerular Filtration Rate (GFR) is used by the National Kidney Foundation to classify the stages. Dialysis or transplantation are the available treatment choices for End-Stage Kidney Disease (ESKD) when GFR is below 15 ml/min[2]. It is currently the third leading cause of mortality globally and is predicted to rise to the fifth rank in terms of years lost to illness by 2040[3]. Screening and early evaluation studies on CKD in India show an overall prevalence of 17.2%[4]. This condition has a multifactorial origin. Chronic conditions like diabetes or hypertension may result in renal impairment

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Article Received on: 16.01.2025 Revised on: 24.02.2025 Accepted on: 03.04.2025

(nephropathy), which may progress to CKD, if they are not effectively managed[5,6]. Several environmental contaminants that contribute to the advancement of CKD include phthalates, melamine, air pollutants, and metals (lead, cadmium, arsenic, and mercury)[7].

The morbid nature of the condition and long-term treatment/dialysis affect the patient's QoL and financial status[8]. Further, because of the advanced pathological changes in the kidney, complete treatment is restricted. Restriction in sodium, potassium, and phosphate consumption, stringent blood pressure control, reduction of proteinuria, and continued physical activity are among the preventive measures for delaying the progression of CKD[9]. Assistance from a team of professionals from various disciplines and providing comprehensive, understandable, and useful educational materials may improve patients' capacity and willingness to use therapeutic and lifestyle measures to impede the progression of CKD[2].

Complementary and alternative systems of medicine are other alternatives to integrate for improving the symptoms and quality of life of patients having CKD[10]. India is a prime example of a nation taking the initiative to incorporate complementary, integrative, and alternative medicine (also known as *Ayush*, which stands for *Ayurveda, Yoga, Naturopathy, Unani, Siddha, Sowa Rigpa*, and *Homoeopathy*) into universal health coverage[11]. Treatment through Complementary and Alternative Medicine (CAM) and Traditional Medicine (TM) is often cost-effective because of local availability, accessibility and fewer side effects. India, with medical pluralism and the National Health Policy 2017, reaffirms the demand to integrate *Ayush* in the National Health Mission, research and education[12]. Though there is limited research done with *Ayush* systems on CKD[13–15], results from the available studies show a positive role of these systems in managing CKD under an integrative setup[16,17]. This study assesses the factors associated with health-related quality of life in CKD dialysis patients and their knowledge of *Ayush* treatment systems.

2. Materials and Methods

2.1 Study Design and Setting

This cross-sectional study comprised 239 patients with chronic kidney disease undergoing hemodialysis. This survey was done at the dialysis unit of Agartala Government Medical College, Tripura, between January 2022 to June 2023. The development and reporting of this cross-sectional survey are as per the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

2.2 Study Participants

The study population comprised individuals with CKD and on dialysis, attending the nephrology/dialysis unit of the Agartala Government Medical College (AGMC), Tripura, aged 18 years and above, and who agreed to be a participant in the survey were enrolled. Patients who were too ill to participate or were unwilling to consent to participate were excluded from the study.

2.3 Data Collection

The investigators at the site approached the patients visiting the dialysis unit of AGMC and made them understand the study's objectives through the patient information sheet. Thereafter, the investigators obtained written informed consent followed by enrollment. The entire process was carried out in the local language for clarity of communication. A questionnaire and standard tool were used for data collection. The data collected in the physical records was entered into a spreadsheet.

2.4 Study Instrument/ Outcome Measures

The questionnaire was developed with insights from a review of several articles related to this study and with professional support from experts in the field. The questionnaire consists of 6 sections, which include: hospital registration details an sociodemographic information, details of health insurance scheme and hospital appointment, diagnostic work-up, investigation details, treatment details and last section on awareness about *Ayush* treatment. The standard tool for detecting quality of life among CKD patients (revised version 1.3 KDQOL-SF™)[18] was used to assess the quality of life of the participants. It includes 24 questions for assessing QoL in 3 domains: Physical Component Summary (PCS), Mental Component Summary (MCS) and KDCS. KDQOL-SF 1.3 is a validated questionnaire available on the RAND Health Care website. As the questionnaire was in English, several patients were unable to complete it on their own. Their responses

were recorded by the research investigator via proper consultation with the patients.

2.5 Explanatory Variables

Respondents' age (less than 50, more than 50 years), gender (male, female), marital status (married, unmarried), education level (no formal education, primary, high school, graduation & above), religion (Hindu, Muslim, Christian), habits either tobacco chewing /alcohol/betel (yes, no), employment status (employed, unemployed, home maker, retired), place of residence (urban, rural), monthly family income (less than Rs 10000, 10001-20000, above 20000), socioeconomic status (above poverty line, below poverty line), duration of illness (less than 01 year, 1-5years, more than 05 years), health insurance (yes, no), medical expense per month (less than Rs 1000, 1001-5000, more than 5000), co-morbidities like diabetes mellitus/hypertension/hypothyroidism (yes, no), duration of dialysis (less than or equal to 6 months, more than 6 months), and frequency of dialysis (once a week, twice a week) were the explanatory variables.

2.6 Sample Size

A convenient sampling method was chosen while enrolling the participants. Considering the prevalence of CKD in India[19,20] is 17%, with relative precision of 5%, a Confidence Interval (CI) at 95% and a design effect of 1, a minimum sample size of 217 participants was needed. After accounting for 15% non-response, the sample size was calculated as 250. 239 participants were enrolled, and 11 were excluded due to Acute Kidney Injury (n=09) and incomplete investigations, which do not testify to CKD (n=02). (Figure 1).

2.7 Ethical Considerations

The approval was obtained in the 27th Central Ethics Committee of CCRH held on 28th January 2022. [Agenda no. 27.03(s), 6-2/2020-21/CCRH/27th Ethical Committee] All ethical requirements were stringently ensured to keep participants confidentiality.

2.8 Statistical Analysis

The data was analysed using Statistical Package for the Social Sciences (SPSS) (version 20). The categorical variables were studied for frequency of distribution and proportion, and continuous variables, mean ±SD, were used. Firstly, descriptive analysis was done to describe socio-demographic characteristics. Next, the ANOVA test was performed to compare the mean scores of each component with socio-demographic and clinical variables of the respondent. Univariate logistic regression analysis was used to study the associations between KDQOL domains (KDCS, PCS, and MCS) and study into three levels: poor, moderate, and good Qol. The level for poor QoL was less than the mean ± 1 SD; the level for moderate QoL was equal to the mean ± SD; and the level for good QoL was more than the mean + 1 SD[21]. For bivariate logistic regression analysis, poor and moderate were combined as one variable. The variables entered in the logistic regression model were the ones that the univariate analysis found to have a significant correlation ($p < 0.05$) with each of the domains (KDCS, PCS, and MCS). Crude Odds Ratios (OR) with 95% CI were reported in univariate analysis. P-values less than 0.05 were treated as significant.

3. Results

3.1 Socio-demographic Data

The study sample consisted of 239 CKD patients undergoing hemodialysis. The mean age was 52.26 years (SD=12.4). 53.3% of participants were above 50 years of age. The male and female were 163 (68.2%) and 76 (31.8%), respectively. 97.9% were married, 53.6% were from rural areas, 48.1% had the highest education level at primary school, 49% were unemployed, 51.9% belonged to Above Poverty Line (APL), with less than INR 10,000 monthly family income in 50.6% and 71.1% did not have any habits or addiction. The proportion of patients with CKD for less than one year was 56.5%, the duration of dialysis less than 6 months was 76.5%, the frequency of dialysis once a week was 90.3%, and the monthly medical expense was more than INR 1000 in 97.4%. 94.1% had comorbidities, but only 42.7% had health insurance (Table 1).

3.2 Outcome of Quality of Life

The score of KDCS (mean±SD: 55.90 ± 7.09) was higher than PCS (mean±SD 38.23 ± 9.69 and MCS (mean±SD: 34.03 ± 12.64). Within the KDCS domain, the scores for the symptoms/list of problems (mean±SD: 83.83±11.51) were highest, followed by dialysis. The

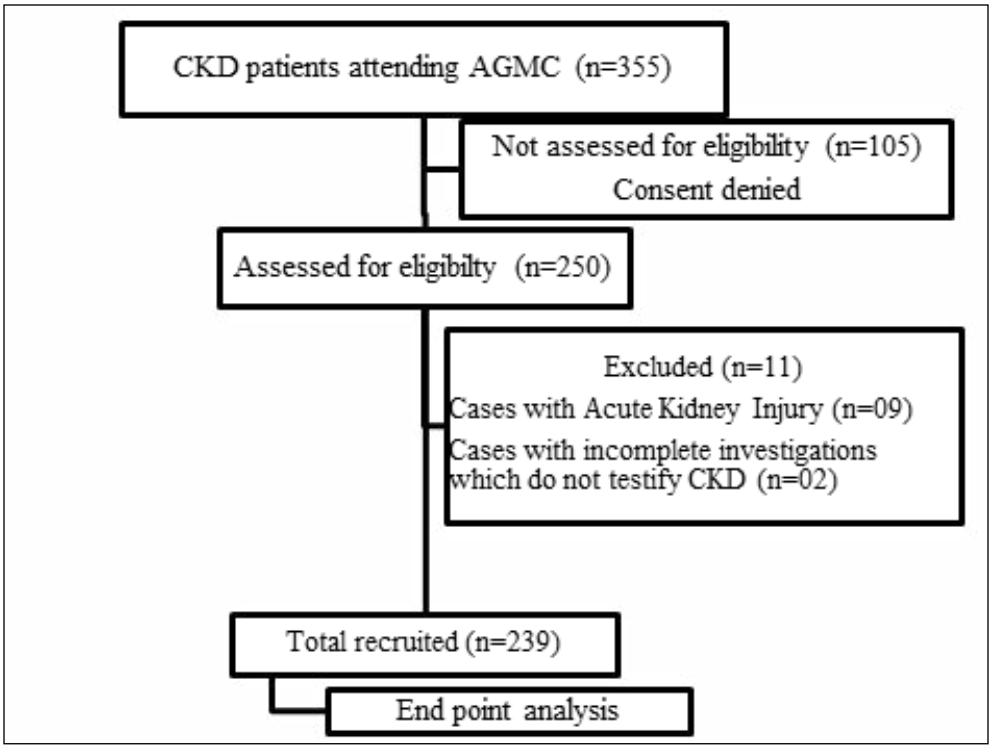


Figure 1. Flow diagram.

staff encouragement score (mean±SD: 76.56±13.07) domains. However, physical (mean±SD: 1.35±9.20) and emotional roles (mean±SD: 5.99±20.18) had the lowest scores. For the level of QoL, 68.2% each in KDCS and PCS domains and 75.3% in MCS were at the moderate level (Table 2).

PCS- Physical Component Summary, MCS- Mental Component Summary

Table 3 depicts the comparison of mean scores of physical, mental and kidney disease components based on sociodemographic and clinical variables of respondents. ANOVA statistics were used to find out whether there is any association between such variables and quality of life. Unmarried participants (mean±SD: 62.06±7.68) and those with no comorbidities (mean±SD: 59.64±7.02) under the KDCS domain and educated participants (mean±SD: 40.15±10.25) under the PCS domain have better quality of life. (Table 3).

In the univariate analysis, unemployed participants (OR=2.61; 95 % CI: 1.11-6.12) and homemakers (OR=4.32; 95 % CI: 1.49-12.49) were considerably associated with poor Qol in the KDCS domain. No

Table 1. Socio-demographic profile, medical information and treatment experiences of participants

Variable	Number of Patients (%)/ Mean ± SD
Socio-Demographic	
Age (in years):	52.26 ± 12.4
Age group (Years)	
Less than 50	102 (42.7)
More than 50	137 (53.3)
Gender	
Male	163 (68.2)
Female	76 (31.8)
Marital status	
Married	234 (97.9)
Unmarried	05 (2.1)
Religion	
Hindu	222 (92.9)
Muslim	14 (5.9)
Christian	03 (1.3)
Education	
No formal education	18 (7.5)
Primary education	115 (48.1)
High school	81 (33.9)
Graduation and above	25 (10.5)

Table 1. Continued...

Variable	Number of Patients (%)/ Mean ± SD
Habits Yes (Tobacco/Alcohol/ Betel) None	 69 (28.8) 170 (71.1)
Place of residence Urban Rural	 111 (46.4) 128 (53.6)
Socioeconomic status Above Poverty Line Below Poverty Line	 124 (51.9) 115 (48.1)
Monthly family income* less than 10000 10001 to 20000 Above 20000	 121 (50.6) 78 (32.6) 38 (15.9)
Employment status Employed Unemployed Home Maker Retired	 33 (13.8) 117 (49.0) 60 (25.1) 29 (12.1)
Medical information and treatment experiences	
Duration of illness (years) less than 01 01 to 05 more than 5	 135 (56.5) 86 (36.0) 18 (7.5)
Duration of dialysis (Months) ≤ 6 > 6	 183 (76.5) 56 (23.4)
Frequency of dialysis (weekly) Once Twice	 216 (90.3) 23 (9.6)0
Leaves (days) 0 1-4 More than 4	 228 (95.4) 6 (2.5) 5 (2.1)
Medical expense/month (Direct cost) less than 1000 1001-5000 more than 5000	 6 (2.5) 217 (90.8) 16 (6.7)
Health insurance ** Yes No PM JAY CGHS RBSY	 102 (42.7) 137 (57.3) 98 (41.0) 1 (0.4) 3 (1.3)

Table 1. Continued...

Variable	Number of Patients (%)/ Mean ± SD
Do you know the signs and symptoms? Yes No Weakness Lack of appetite Swelling in the body Breathing difficulty Misc.	 192 (80.3) 47 (19.7) 155 (64.9) 65 (27.2) 59 (24.7) 63 (26.4) 187 (78.2)
Do you know the prognosis? Yes No	 211 (88.3) 28 (11.7)
Taking treatment for CKD Allopathy Allopathy+ Homoeopathy Allopathy+ Ayurveda Allopathy+ Ayurveda+ Homoeopathy	 224 (93.7) 12 (5.0) 2 (0.8) 1 (0.4)
Co-morbidities Yes (Diabetes Mellitus/ Hypertension/ Hypothyroidism) No	 225 (94.14) 14 (5.85)
S. creatinine (mg/dl) S. Urea (mg/dl) * eGFR (ml/min/1.73m2)	7.96 ± 3.16 110.83 ± 53.30 7.77 ± 4.19

* Values missing- Monthly family income - 2, S. urea - 42 ** PM-JAY- Pradhan Mantri Jan Arogya Yojana, CGHS-Central Government Health Scheme, RSBY-Rashtriya Swasthya Bima Yojana

variable was significantly related to the PCS and MCS domains (Table 4).

3.3 Information About *Ayush* Systems of Treatment

More than half (55.6%) got information about *Ayush* treatment from friends, 41.4% from family members, and 36.4% from television media. Advice to take *Ayush* treatment for any health issues was received from neighbours (19%), and friends (14.2%), whereas only 13% opted on their own will. The reasons to opt for *Ayush* treatment were being safe, having fewer side effects (47.3%), and being less costly (47.7%). On further enquiry regarding circumstances to take

Table 2. Mean score of QoL of study population

	Parameters	Mean Scores ± SD	Level of QoL, n (%)		
	36-Item Health Survey (n=239)		Poor (<Mean – 1 SD)	Moderate (Mean +/- 1 SD)	Good (>Mean + 1SD)
KDCS	Symptoms/List of problems	83.83 ± 11.51	32 (13.4)	163 (68.2)	44 (18.4)
	Effects of kidney disease on daily Life	45.21 ± 14.41			
	Burden of kidney disease	34.36 ± 21.85			
	Cognitive Functioning	66.41 ± 19.21			
	Quality of social interaction	56.54 ± 13.28			
	Sexual Functioning	30.80 ± 27.80			
	Sleep	54.87 ± 8.22			
	Social Support	67.01 ± 11.47			
	Dialysis Staff Encouragement	76.56 ± 13.07			
	Patient Satisfaction	43.37 ± 10.65			
	Total	55.90 ± 7.09			
PCS	Physical Functioning	37.48 ± 21.31	38 (15.9)	163 (68.2)	38 (15.9)
	Physical Role	1.35 ± 9.20			
	Pain	68.60 ± 25.06			
	General Health	45.47 ± 5.69			
	Total	38.23 ± 9.69			
MCS	Emotional Well-Being	50.81 ± 12.42	29 (12.1)	180 (75.3)	30 (12.6)
	Emotional ole	5.99 ± 20.18			
	Social Functioning	44.50 ± 19.39			
	Energy/Fatigue	34.81 ± 15.50			
	Total	34.03 ± 12.64			

KDCS- Kidney Disease Component Summary,
PCS- Physical Component Summary, MCS- Mental Component Summary

Table 3. Comparing the mean scores of physical, mental and kidney disease components based on sociodemographic and clinical variables of respondents

Variable	KDCS			PCS			MCS		
	Mean ± SD	F-value	p-value	Mean ± SD	F-value	p-value	Mean ± SD	F-value	p-value
Age group (Years)									
Less than 50	56.43±7.52			39.83±9.95			34.44±13.66		
More than 50	55.50±6.74	1.00	0.31	37.03±9.36	4.95	0.02*	33.72±11.87	0.19	0.66
Gender									
Male	56.12±7.16			38.53±9.55			34.78±12.53		
Female	55.42±6.95	0.49	0.48	37.58±10.03	0.50	0.48	32.42±12.80	1.81	0.18
Marital Status									
Married	55.76±7.03			38.22±9.70			34.13±12.69		
Unmarried	62.06±7.68	3.90	0.04*	38.87±10.59	0.02	0.88	29.30±9.89	0.71	0.39

Table 3. Continued...

Variable	KDCS			PCS			MCS		
	Mean ± SD	F-value	p-value	Mean ± SD	F-value	p-value	Mean ± SD	F-value	p-value
Religion									
Hindu	55.66±7.08			38.11±9.75			34.13±12.76		
Muslim	58.69±6.92			39.66±8.88			33.83±12.01		
Christian	60.43±5.01	1.84	0.16	40.13±11.79	0.22	0.79	27.16±4.73	0.45	0.63
Education									
No Formal Education									
Primary Education	55.25±6.00			34.42±7.87			32.40±10.56		
High School	55.15±5.97			37.12±8.14			33.44±9.16		
Graduation and above	57.01±8.45 56.15±7.61	1.15	0.32	40.06±11.44 40.15±10.25	2.77	0.04*	34.39±16.75 36.74±12.66	0.58	0.62
Habits									
Yes (Tobacco/ Alcohol/Betel)	55.37±6.66			38.52±10.15			32.77±13.26		
None	56.16±7.26	0.48	0.48	38.13±9.59	0.06	0.80	34.54±12.46	0.90	0.34
Employment status									
Employed	56.69±8.30			40.41±9.71			35.02±10.12		
Unemployed	56.04±7.46			38.29±9.97			35.03±13.46		
Home Maker	55.48±6.29			36.89±9.04			31.34±12.44		
Retired	55.25±5.71	0.30	0.82	38.27±9.88	0.93	0.42	34.43±11.95	1.22	0.30
Place of residence									
Urban	55.77±7.11			37.63±9.22			33.77±12.05		
Rural	56.07±7.09	0.18	0.66	38.77±10.16	0.75	0.38	34.25±13.27	0.09	0.75
Monthly family income (INR)									
less than 10000	55.99±7.14			37.17±9.54			34.10±13.49		
10001 to 20000	55.07±6.96			39.11±9.91			33.55±11.97		
Above 20000	57.51±7.07	1.52	0.22	39.86±9.81	1.57	0.20	34.77±11.74	0.12	0.88
Socioeconomic Status									
Above Poverty Line									
Below Poverty Line	56.11±6.95 55.66±7.25	0.24	0.62	38.81±9.37 37.60±10.03	0.92	0.33	35.27±12.04 32.68±13.18	2.51	0.11
Duration of illness (years)									
less than 01	55.34±7.51			37.58±10.41			33.46±12.54		
01 to 05	56.39±6.11			38.52±8.93			34.75±11.36		
more than 5	57.72±8.00	1.21	0.29	41.70±6.81	1.49	0.22	34.85±18.59	0.31	0.72
Health Insurance									
Yes	55.83±7.28			38.04±9.74			33.44±12.58		
No	55.95±6.96	0.01	0.89	38.37±9.69	0.06	0.79	34.46±12.71	0.37	0.54
Medical Expense/ Month (Direct cost)									
less than 1000	55.55±10.24			37.50±10.83			37.54±23.89		
1001-5000	56.16±7.07			38.17±9.76			34.06±12.40		
more than 5000	52.38±5.30	2.14	0.11	39.37±8.79	0.13	0.87	32.31±11.02	0.37	0.68

Table 3. Continued...

Variable	KDCS			PCS			MCS		
	Mean ± SD	F-value	p-value	Mean ± SD	F-value	p-value	Mean ± SD	F-value	p-value
Co-morbidities									
Yes (Diabetes Mellitus/ Hypertension/ Hypothyroidism)	55.66±7.04			37.89±9.34			33.69±12.52		
No	59.64±7.02	4.19	0.04*	43.72±13.53	4.85	0.02	39.41±13.76	2.71	0.10
Duration of Dialysis (Months)									
≤ 6	56.20±7.30			38.38±9.83			33.99±13.13		
> 6	54.91±6.30	1.42	0.23	37.73±9.30	0.19	0.66	34.16±10.99	0.008	0.92
Frequency of Dialysis (weekly)									
Once	55.83±7.03			38.23±9.78			34.46±12.54		
Twice	56.55±7.74	0.21	0.64	38.26±9.02	0	0.98	29.94±13.11	2.67	0.10

Table 4. Factors associated with good Qol in KDCS, PCS and MCS in univariate analysis

Variable	KDCS		PCS		MCS	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Age (Years)						
Less than 50 [Ref.]	1.00					
More than 50	0.81 (0.41:1.59)	0.54	1.61 (0.80:3.23)	0.17	0.88 (0.40:1.92)	0.75
Gender						
Male [Ref.]	1.00					
Female	1.30 (0.62:2.69)	0.47	1.61 (0.72:3.59)	0.24	1.61 (0.66:3.95)	0.29
Marital status**						
Unmarried [Ref.]	1.00					
Married	3.04 (0.49:18.81)	0.23	1.33 (0.14:12.24)	0.80	00	0.99
Education						
No formal education	1.57 (0.33:7.38)	0.56	1.09 (0.16:7.30)	0.92	1.52 (0.24:9.38)	0.65
Primary education	2.71 (0.90:8.10)	0.07	1.07 (0.28:4.07)	0.92	1.63 (0.48:5.56)	0.43
High school	0.79 (0.28:2.24)					
Graduates [Ref.]	1.00	0.66	0.41 (0.11:1.53)	0.18	1.09 (0.31:3.75)	0.88
Habits						
Yes	0.84 (0.41:1.70)					
None [Ref.]	1.00	0.63	0.64 (0.31:1.33)	0.23	0.78 (0.34:1.78)	0.56
Occupation						
Unemployed	2.61 (1.11:6.12)	0.02*	1.48 (0.55:3.92)	0.43	1.12 (0.38:3.34)	0.82
Home maker	4.32 (1.49:12.49)	0.007*	2.42 (0.74:7.93)	0.14	2.50 (0.62:10.04)	0.19
Retired	3.57 (1.00:12.73)					
Employed [Ref.]	1.00	0.05	0.84 (0.25:2.78)	0.78	0.85 (0.22:3.32)	0.82
Residence						
Rural	1.19 (0.61:2.29)					
Urban [Ref.]	1.00	0.60	0.81 (0.40:1.63)	0.55	0.74 (0.34:1.61)	0.45
Monthly income (INR)						
Less than 10,000	2.33 (0.98:5.51)	0.05	1.77 (0.72:4.36)	0.21	1.43 (0.50:4.03)	0.49
10,001-20,000	1.71 (0.69:4.20)					
More than 20000 [Ref.]	1.00	0.24	1.89 (0.70:5.05)	0.20	1.27 (0.42:3.81)	0.66

Table 4. Continued...

Variable	KDCS		PCS		MCS	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Socioeconomic status (SES)						
Below Poverty Line	1.80 (0.91:3.54)					
Above Poverty Line [Ref.]	1.00	0.08	1.33 (0.66:2.69)	0.42	1.71 (0.77:3.77)	0.18
Duration of illness (Years)	1.00					
less than 01 [Ref.]						
1-5	1.07 (0.53:2.18)	0.83	0.94 (0.45:1.98)	0.88	0.71 (0.31:1.62)	0.42
>5	0.79 (0.24:2.62)	0.70	0.92 (0.24:3.46)	0.90	0.40 (0.11:1.40)	0.15
Having health insurance						
No	0.81 (0.41:1.59)					
Yes [Ref.]	1.00	0.54	0.74 (0.36:1.53)	0.42	0.63 (0.28:1.42)	0.27
Direct cost/month (INR)						
less than 1000 [Ref.]	1.00					
1001-5000	0.83 (0.09:7.32)	0.86	1.07 (0.12:9.50)	0.94	1.35 (0.15:11.98)	0.78
>5000	3.00 (0.15:57.36)	0.46	0.86 (0.07:10.42)	0.91	3.00 (0.15:57.36)	0.46
Comorbidities						
Yes	1.85 (0.55:6.19)					
No [Ref.]	1.00	0.31	2.24 (0.66:7.57)	0.19	1.17 (0.24:5.51)	0.84
Duration of dialysis						
≤ 6 months [Ref.]	1.00					
> 6 months	1.46 (0.63:3.37)	0.36	1.17 (0.50:2.73)	0.70	1.61 (0.58:4.43)	0.35
Frequency of dialysis (weekly)						
Once [Ref.]	1.00					
Twice	0.60 (0.22:1.63)	0.32	1.28 (0.36:4.57)	0.69	0.95 (0.26:3.42)	0.94

Ayush treatment, 15.5% choose *Ayush* treatment as a mode of treatment immediately upon getting ill, and 46.4% choose to take it when they get no relief after prolonged use of allopathic medications. Homoeopathy is preferred by 46.9% for their illness. However, only 14.2% (n=34) had taken any *Ayush* treatment for their CKD since the time they were diagnosed. Out of them, 47% took homoeopathic treatment. (Table 5)

4. Discussion

This cross-sectional study involved patients undergoing haemodialysis with CKD above 18 years at Agartala Government Medical College, showing poor quality of life and awareness towards *Ayush* systems in the treatment of CKD. 52.26 years (SD=12.4) was the mean age of the participants, which is coherent with the findings of the earlier studies[21,22].

The mean score of KDCS (55.90) was more than PCS (38.23) and MCS (34.03). Furthermore, the physical role (1.35) and emotional role (5.99) had the lowest mean score. Dialysis sessions, comorbidities, and unemployment may be contributing factors for this. Similar results are also seen in research done in South India.[22] and Palestine[23]. On the other hand, the highest mean scores were symptoms/list of problems (83.83) and dialysis staff encouragement (76.56) domains. In a study done in Thailand[24], dialysis staff

Table 5. Awareness about Ayush treatment among the study population

Questions	n (%)
Information about Ayush medicines*	
Family members	99 (41.4)
Friends	133 (55.6)
Newspaper	36 (15.1)
Television	87 (36.4)
Social media	44 (18.4)
Reason for opting for Ayush treatment*	
Safe and fewer side effects	113 (47.3)
Natural	74 (31.0)
Less costly	114 (47.7)
More effective	22 (9.2)
Easily available	13 (5.4)
Who advised you to take Ayush medicines for health issues/illnesses?*	
Family members	8 (3.3)
Friends	34 (14.2)
Neighbours	46 (19.2)
Self	31 (13.0)
Allopathic Doctors	3 (1.3)
Under what circumstances do you generally take Ayush medicines?*	
Immediately on falling ill.	37 (15.5)
No relief soon after allopathic medicine	68 (28.5)
No relief after prolonged use of allopathic medicine	111 (46.4)
Which one of the Ayush systems of medicine is most preferred by you?*	
Ayurveda	38 (15.9)
Yoga and Naturopathy	9 (3.8)
Unani	0
Siddha	0
Homoeopathy	112 (46.9)
Have you taken any Ayush treatment earlier for CKD?	
Yes	34 (14.2)
No	205 (85.8)
Ayurveda	13 (38.2)
Unani	0
Siddha	0
Homoeopathy	16 (47.0)
Homoeopathy + Ayurveda	2 (5.8)
Missing information	3 (8.8)
Did you get any benefit from it? *	
Yes	13 (38.2)
No	19 (55.8)
Missing Information	2 (5.8)

*Multiple options were selected; therefore, the total percentage cannot be rounded to 100

encouragement was seen to have the highest score. 68.2% in KDCS at the moderate level was consistent with the studies[21,24], 68.2% in the PCS domain at a moderate level was similar to the study done in Thailand[24], and 75.3% in MCS at the moderate level were similar to the study done in Nepal[21]. Thus, overall, there is a poor quality of life in patients suffering from CKD[25] especially for long-term diseases like chronic kidney disease (CKD. Unemployed participants and homemakers were considerably associated with poor QoL in the KDCS domain, which is consistent with the finding in the previous study.[24], while in another study[21] unemployment is associated with good QoL in the PCS and MCS domains. It is likely that differing perspectives, methodological discrepancies, and social and lifestyle diversities, some of which may yet be unknown—are accountable for the variations among specific associations. Therefore, studying in different settings would give more meaningful and specific findings.

Ayush system of medicine is less explored in cases where mortality is high. Only 15.5% choose the *Ayush* system as a mode of treatment immediately on falling ill, and 46.4% when they get no relief after prolonged use of allopathic medicine. Homoeopathy is preferred by 46.9% for their illness. However, only 14.2% (n=34) had taken any *Ayush* treatment for their CKD since the time they were diagnosed. A recent study by Singhal *et al*[26] attitude, perception and practice of Ayurveda, yoga, Unani, Siddha, homeopathy and naturopathy (AYUSH shows that allopathic physicians and interns are cognizant of the *Ayush* system, benefit for themselves, and advise patients to do the same. Additionally, they think that learning about *Ayush* therapies and how they work with allopathic medicine could enhance patient care. However, the current clinical condition under discussion requires awareness amongst all the health care providers to improve and have a continuum of patient care and thereby contribute to Universal health coverage.[27] its delivery requires an adequate health infrastructure, skilled health human resources, and access to affordable drugs and technologies so that all people receive the level and quality of care they are entitled to. This paper attempts to link the *ayurveda*, *yoga* and *naturopathy*, *unani*, *siddha* and *homoeopathy* (*AYUSH)*.

4.1 Strengths

This study may be the first attempt to assess the QoL of CKD patients undergoing haemodialysis along with awareness of the *Ayush* system as a mode of treatment. The study highlights poor quality of life among CKD patients on dialysis and poor knowledge of participants, along with attitude and practice towards the *Ayush* system. The study highlights that allopathy remains the preferred system for the treatment of CKD, so it reinforces the integrative approach to the treatment to reduce the burden of dialysis in such conditions.

4.2 Limitations

This study has several limitations to consider. Since the study is single-centred, the generalisability of findings is constrained. Firstly, depending too much on self-reporting raises the possibility of over- or underestimating certain variables. Secondly, the study lacked information about the environmental pollutants which may be responsible for the development of CKD. There exists another limitation, being a cross-sectional design study, which can only explore the association between Quality of life in CKD patients on dialysis, but cannot verify the causal relationship between them.

4.3 Future Implications

The high prevalence and consequences associated with hypertension and Diabetes mellitus pose a serious threat to the population suffering from CKD. From our study, it is recommended to increase public awareness about comorbidities, the *Ayush* system and implement the integrative approach for the treatment of CKD patients.

5. Conclusion

The study highlights poor quality of life among CKD patients on dialysis and poor knowledge of participants, along with attitudes towards the *Ayush* system. The study also highlights that poor knowledge about *Ayush* treatment modalities for CKD reinforces the opportunity to bring awareness about the integrative approach to the treatment with *Ayush* systems to reduce the burden of dialysis and improve quality of life in such conditions.

6. Acknowledgement

The authors convey their gratitude to all the patients who actively participated in this study.

7. Author Contribution

Conceptualisation, R.K.D, V.R, R.C.S and A.C; methodology, V.R, A.C and S.S; acquisition of data: A.C and R.D; analysis and/or interpretation of data, V.R and S.P.; drafting the manuscript, V.R, A.C and S.P; revising the manuscript critically for important intellectual content: R.K.D, S.K, and S.R. All authors have read and agreed to the published version of the manuscript.

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