Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
Impact Factor (RJIF): 6.35
www.phytojournal.com
JPP 2025; 14(6): 364-368
Received: 05-09-2025
Accepted: 08-10-2025

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Dietary knowledge, attitude, practice and barriers among ckd stage 5 hemodialysis patients: A pilot study

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DOI: https://doi.org/10.22271/phyto.2025.v14.i6e.15676

Abstract
Background: Chronic kidney disease (CKD) stage 5 patients on maintenance hemodialysis require strict dietary and fluid management to prevent complications. This pilot study assessed dietary knowledge, attitudes, practices, and barriers among CKD stage 5 patients.
Methods: An observational pilot study of ten CKD stage 5 hemodialysis patients was conducted using a validated questionnaire assessing demographic profile, clinical variables, diet adherence patterns, and perceived barriers. Descriptive statistics were used.
Results: All patients showed good dietary knowledge but adherence declined with longer dialysis duration. Key barriers included taste issues, cultural food habits, conflicting dietary advice, caregiver burden, and psychosocial factors such as fatigue and hopelessness.
Conclusion: Despite adequate knowledge, renal diet adherence is suboptimal in long-term dialysis patients due to multifactorial barriers. Regular counseling, caregiver engagement, consistent dietary guidance, and digital reminder tools may improve adherence.

Keywords: ckd stage 5, Haemodailysis**,** diet awareness, diet adherence, Barriersin adherence, addressing barriers

Introduction
Chronic kidney disease encompasses a spectrum of pathophysiological processes associated with abnormal kidney function, often marked by a progressive decline in the glomerular filtrate rate and amount of albuminuria [1]. Chronic kidney disease is diagnosed with a reduced GFR persisting for three months or more, irrespective of the underlying causes.Staging is based on parameters according to KDIGO guidelines [2].
Chronic kidney disease contributes significantly to global non-communicable disease burden. In India, prevalence is estimated at roughly 800 per million population with ESRD incidence around 150-200 per million, which indicates good amount of resources for maintenance HD and dietary support [3, 4].
In Ayurveda, CKD corresponds to Vrukka roga and is mentioned as an upadrava of Mutravaha srotas vyadhi, with samprapti involving vitiation of Vata, Pitta, and Kapha leading to toxin accumulation, impaired filtration, oliguria, systemic imbalance, and fluid overload. This pathophysiology predisposes individuals to many cardiovascular diseases,reduced quality of life, and increased healthcare costs, dependency, and physiological regression.
Bhaisahjyaratnakar directly mentioned the vrukka rog. In foundational samhita,direct reference to vrukka roga is not found. Vrukka rog is said to be kruchhrasadhya, which is difficult to treat owing to its gradual onset and irreversibility. And Yapya -indicates that its treatment mainly focuses on palliation and symptomatic relief [5, 6, 7].
.Pathya -Apathya hold a fundamental importance in Ayurveda in both i.e. maintaining a healthy state and in disease management apart from medicinal intervention. Ayurvedic prescribed pathya apathy emphasis on improving agni, reduction of vitiated doshas, eliminate kleda and to restore metabolic harmony like bala, varna etc of the diseased patient [8].
Clinical studies of dietary intervention have shown promising efforts that regresses further CKD progression keeps Hypertension and blood sugar levels, toxic end product production in control, ensures adequate nutrition to maintain energy levels, muscle strength, and overall health, minimizes other complications such as fluid overload, electrolyte imbalance, anaemia and bone diseases, and helps to achieve a better quality of life when combined with HD and pharmacotherapy. Thus, diet is not merely a supportive measure, but it acts as a synergistic agent to therapeutic procedures and pharmacological medicine that helps patients to manage their ckd side effects better and slow down its progression.

However adherence to diet fades over time, reflecting psychosocial, cultural, and healthcare system barriers that overpower initial counseling and motivation, especially in long-term HD. This pilot study evaluates Knowledge, Attitude, Practice i.e., adherence patterns, and barriers to renal diet and fluid restriction among CKD stage 5 HD patients and suggests practical approaches using technology to harmonies modern and Ayurveda knowledge for better patient care.

Methods: Study design and setting: An observational pilot study was conducted at Hon. Shri Annasaheb Dange Ayurved Medical College, Ashta, Sangli, a single -center tertiary Ayurveda teaching hospital dialysis unit.

Sampling: Non-probability convenience sampling

Inclusion Criteria: of age 18-80 years, both sexes, Indian community, irrespective of socio-economic strata and diet types.

Exclusion Criteria: below 18 years and above 60 years of age other stages of CKD

Data Collection And Instruments: A self-structured, validated questionnaire were asked during routine dialysis to collect demographics, education, employment, co morbidities, dialysis frequency and duration, diet component, salt, sugar,dry fruits intake,milk, water other fluids intake and measurement behaviors,self-rated quality of life, reasons for partial or non- adherence to recommended dietary advises. Primary outcomes were level of knowledge, attitude towards the disease and its dietary advices relationship, practice/adherence patterns
.Secondary outcome included knowing of barrier or gaps, course of detoriating quality of life.
Prior written informed consent was taken from all included participants. The procedures followed the rules of the institution's ethics committee and the internationally accepted Helsinki Declaration, as noted in the manuscript.

Analysis: Because of small sample size, simple statistics were used to describe patterns. The study looked for possible links between how well participants knew about dietary rules, adherence to the diet and the reasons for partial/non-adherence of diet, factors like how long and how often they had dialysis, as well as demographic details, without using advanced statistical tests.

Result

Table 1: The majority of the patients were between 45-60 years, with only 1 in the 30-44 years age group

Variable	Category	Count (n)	Percentage (%)
Age Group	30-44 years	1	10%
	45-60 years	9	90%
Gender	Male	8	80%
	Female	2	20%
Marital Status	Married	9	90%
	Unmarried	1	10%
Education Level	Postgraduate	2	20%
	Secondary/Higher Secondary/Graduate	8	80%
Employment Status	Employed Before HD	10	100%
	Continued after HD	2	20%
	Discontinued after HD	8	80%
Co-morbidities	Hypertension	8	80%
	Diabetes Mellitus	4	40%
	Both HTN + DM	4	40%
	Secondary HTN	2	20%
	NSAID Nephropathy	1	10%
	Postoperative etiology	1	10%

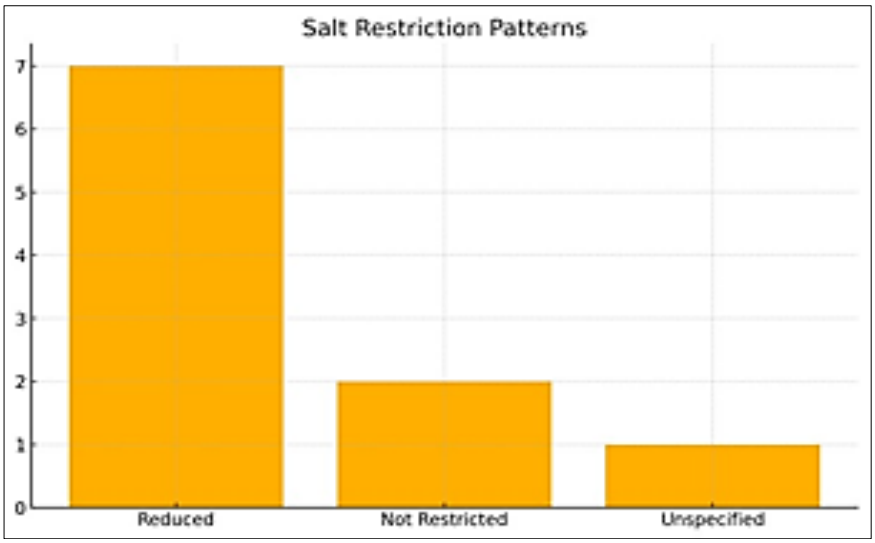
In terms of marital status, one was unmarried, and the rest were married. Education was low overall with only two postgraduates; Employment: pre-dialysis employment varied, but most discontinued jobs after starting HD, with only two continued shopkeeping work.

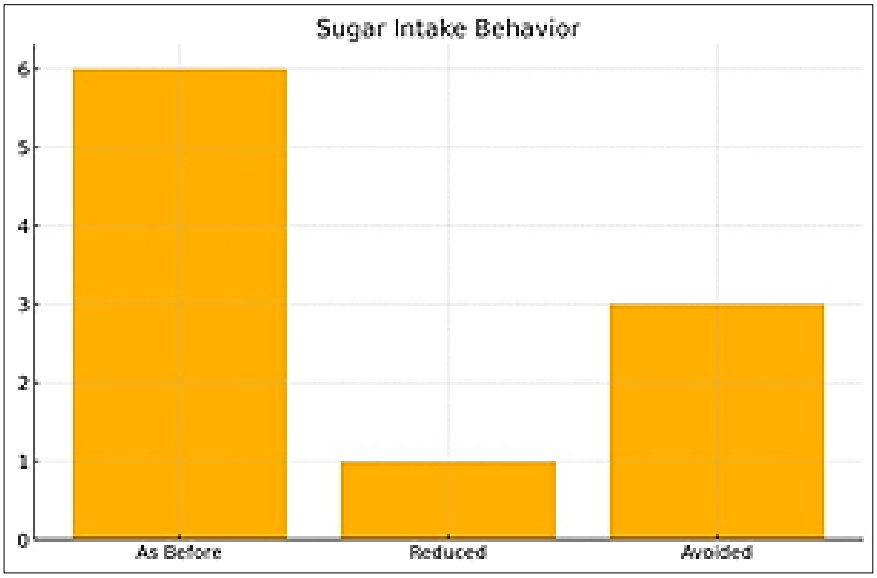
Co morbidities and HD profile

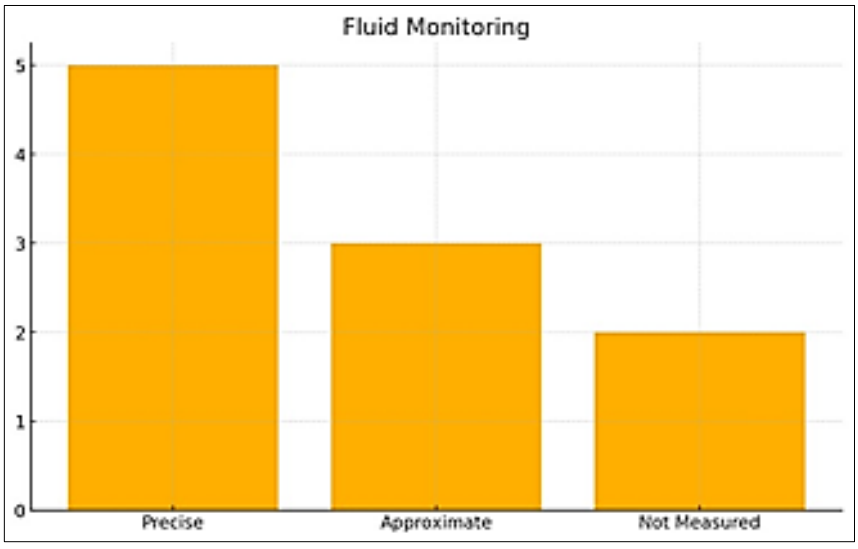
Hypertension was present in 8/10 and diabetes mellitus in 4/10, with four having both; secondary hypertension was noted in two; etiologies included postoperative complications for one and NSAID-associated nephropathy for one with osteoarthritis; Dialysis frequency was two to three sessions weekly, with duration ranging from 8 months to 5 years.

Diet knowledge and components: All participants reported good knowledge of renal diet restrictions and fluid management; typical diets included legumes (moong, masur, chana, tur dal), cereals (wheat, jowar chapatis, white rice), fruits (apples, guava), one cup of milk, occasional dry fruits, and fluid limits around 1 liter daily.

Salt, Sugar and Fluid Intake



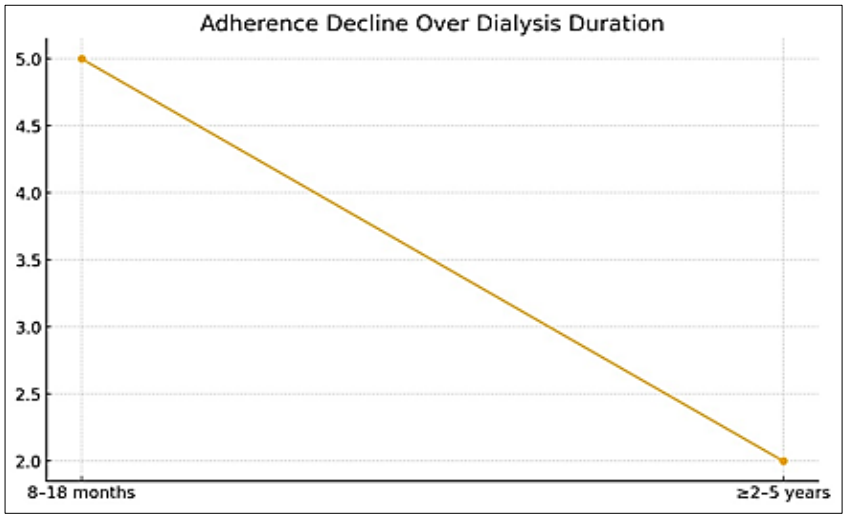




Seven of ten reduced salt intake by avoiding table salt and only consuming salt that was put during cooking, two did not restrict salt, and one was unspecified; six consumed sugar as before, one reduced sugar, and three avoided sugar entirely.

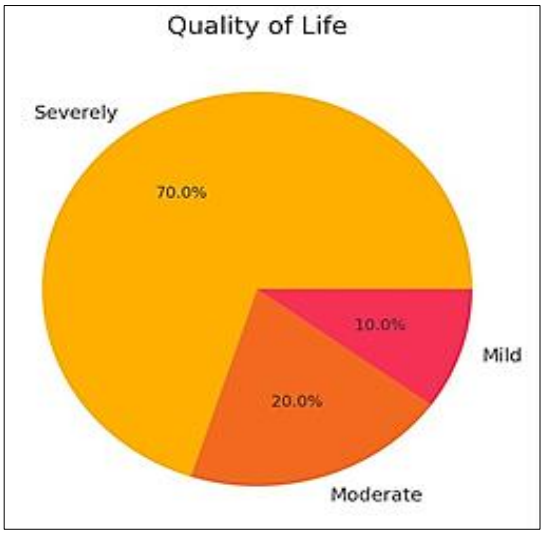
Five measured fluid intake precisely, three measured approximately, and two did not measure at all, suggesting partial implementation of fluid restriction behaviors.

Adherence pattern



Patients within 8-18 months of starting HD reported stricter adherence; those on HD for ≥2-5 years reported partial to poor adherence, indicating adherence attrition with chronicity of dialysis exposure.

Quality of life



Seven reported severely hampered qol and two reported moderately hampered qol, due to

Problems arising because of symptoms, treatment, and emotional challenges from being on long- term hemodialysis (HD).

Barriers to Adherence

Barrier	Reported by Patients
Bland low-salt taste	8
High-potassium cultural foods	7
Communal eating	7
Conflicting medical advice	6
Limited renal-friendly options	6
Caregiver overload	5
Depression	6
Post-dialysis fatigue	7
Hopelessness	5
Decision fatigue	4
Cognitive impairment	3
Loss of strength/weight	5

Reported reasons included bland taste of low-salt diets, culturally prevalent high-potassium staples, communal eating norms, conflicting advice between nephrologists, dietitians, nursing staff, and family, limited availability of kidney-

friendly options, caregiver permissiveness or overload, depression, post-dialysis fatigue, hopelessness, decision fatigue, cognitive impairment, weight and strength loss, and unwillingness to exert sustained effort, No clear relationship was observed between adherence and age, sex, marital status, education, employment, co morbidity burden, or dialysis frequency; there was no significant correlation noted between dialysis duration or frequency and measured water intake due to small sample and behavioral variability.

Discussion

Principal findings: This pilot study found universal awareness of renal diet and fluid restrictions among CKD stage 5 HD patients, yet adherence faded with longer dialysis duration, due to psychosocial, cultural, and multilevel-medical system factors overpowering knowledge and initial motivation over time.

Medicine controls the complications but cannot reverse the damage nor hemodialysis can fully replace the functions of the kidney;, as a supportive measure, many clinical practice data have demonstrated the importance of dietary intervention, which helps to slow down disease progression, help to control the blood sugar levels, water retention, and production of uremic toxins. Many review studies, have found that excess nutrients impair renal function; for example, a high-protein diet increases the uremic toxin levels. Excess sugar and salt intake exacerbates ongoing kidney disease; hence, a low-protein, low-sodium, and low-sugar diet is very helpful. Studies have found that a Mediterranean diet, which includes plants, fruits, non-fermented vegetables, legumes, coffee, and Alliums vegetables, has a significantly lower risk of CKD. A

Very similar list has already been given to Samhita [9, 10, 11].

Patients knowledge and attitude don't reflect in their practice after a certain period of time, their reasons for partial and non-adherence to it were as follows: low salt food taste bland, traditionally high potassium crabs enriched diet, communal eating in Indian family, conflicting and differing advice from nephrologist,dietician,nursing staff,family member leading to patient confusion,limited kidney- friendly food option, permissive or overburdened caregiver, psychological factors such as depression, post-dialysis fatigue,hopelessness,decision fatigue, cognitive impairment, weight loss, strength loss, and not willingness to take effort. In Ayurveda, also following the right diet (Pathya) is hard when digestion (agni), strength (bala), and mental energy (manasika bala) are weakened by long illness and treatment.

Just one time councelling at the very beginning of dialysis is not enough, regular and constant support from health care workers about dietary councelling,alternatives that are easily available in local markets,cooking methods like leaching,making food taste good without adding salt and sugar and also constant councelling of caregivers to help patient state adherent to their diet protocols is required.

Using simple technologies like mobile app, text reminders, on-call councelling, regular check-ins at dialysis center,one clear and opinion on diet from doctors and nursing staff -all these will reduce mental burdern, confusion among patients and will help them to adhere to their diet.Brief screening of depression among patients.Inculcating ayurvedic practices like pranayam, abhyang, and healthy meal planning may help improving their well-being and diet adherence alongside medical care [12].

This above conducted study is strong because it focuses on real dialysis patients in an Ayurvedic setting and captures cultural and caregiving challenges. But it's limited by a small group of patients, self-reported data, and no lab measures of diet adherence, so results may

Not apply widely.

Conclusion

Aspect	Count
Knowledge (Good)	10
Attitude (Positive)	10
Strict Adherence (Early HD)	5
Partial/Poor Adherence (Late HD)	5

CKD stage 5 patients on HD, knowledge and positive attitudes toward renal diet and fluid restriction are common, but sustained practice declines as dialysis goes on longer, as it gets harder to stick to these habits because of social, cultural, and healthcare system challenges, like taste, family eating habits, mixed messages from clinicians, and tiredness. To improve this, patients need constant ongoing support, including consistent advice from all healthcare providers, meal plans that fit their culture, help from caregivers, and the use of digital tools to remind and support them.

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