

FROM KNOWLEDGE TO NUTRITION: UNDERSTANDING DIETARY INTAKE AMONG CKD PATIENTS IN PESHAWAR

Asad Ullah Khan*

Nursing Lecturer, Nice College of Nursing, Peshawar, Pakistan.

Asia Naureen

Trainee Nursing Officer, Afridi Medical Complex (AMC), Peshawar, Pakistan.

Danish Ahmad

Trainee Nursing Officer, Pakistan Institute of Medical Sciences (PIMS), Islamabad, Pakistan.

Mohsin Khan

Trainee Nursing Officer, Khyber Teaching Hospital (KTH), Peshawar, Pakistan.

Kashif Atta

Trainee Nursing Officer, Khyber Teaching Hospital (KTH), Peshawar, Pakistan.

Rashid Khan

Trainee Nursing Officer, Lady Reading Hospital (LRH), Peshawar, Pakistan.

Noor Muhammad

Trainee Nursing Officer, Lady Reading Hospital (LRH), Peshawar, Pakistan.

Sadiq Noor

Trainee Nursing Officer, Frontier Corps Teaching Hospital (FCTH), Peshawar, Pakistan.

Janaid Khan

Trainee Nursing Officer, Lady Reading Hospital (LRH), Peshawar, Pakistan.

Muhammad Saqib

Trainee Nursing Officer, Pakistan Institute of Medical Sciences (PIMS), Islamabad, Pakistan.

Author Details

Keywords:

Chronic Kidney Disease (CKD), Renal Diet, Dietary Knowledge, Dietary Compliance, Electrolyte Regulation.

Received on 05 Jan, 2026

Accepted on 19 Feb, 2026

Published on 05 March, 2026

Corresponding E-mails & Authors*:

Asad Ullah Khan

asadyar100@gmail.com

Abstract

Background: Chronic kidney disease (CKD) progression can be slowed through appropriate dietary restrictions. However, patients' understanding of renal nutrition often remains limited, affecting disease management and outcomes.

Objective: This study aimed to assess the level of dietary knowledge among patients with CKD attending tertiary care hospitals in Peshawar.

Methods: A cross-sectional study was conducted among 152 patients diagnosed with CKD in selected tertiary hospitals of Peshawar. Data were collected using a structured questionnaire and analyzed through SPSS version 26.

Results: Most participants were married (80.3%) and male (56.6%), with nearly half (48.0%) having no formal education. The mean

knowledge score was 68.8% (SD ± 9.7), indicating a moderate level of awareness. While participants generally understood dietary restrictions related to salt and water, many lacked knowledge about nutrients such as protein, phosphorus, and potassium. Educational status and place of residence were significantly associated with knowledge levels.

Conclusion: The findings emphasize the need for simple, culturally appropriate, and dietitian-led educational interventions to improve nutritional awareness among CKD patients.

INTRODUCTION

Chronic kidney disease (CKD) is defined as kidney damage or a glomerular filtration rate (GFR) below 60 mL/min/1.73 m² lasting for at least three months, regardless of the underlying cause [1, 2]. It affects an estimated 8–16% of the global population, with nearly 850 million people living with the disease worldwide [3, 4]. According to the Global Burden of Disease report (2015), CKD ranks among the top five causes of death in several countries [5]. Because it often progresses silently, CKD is frequently diagnosed incidentally during routine checkups [7]. It remains a serious global health issue, contributing to high rates of illness and death. Among the different management strategies, nutritional therapy, particularly a kidney-friendly diet plays a central role in slowing disease progression and controlling related complications [8]. Evaluating both the quality and quantity of dietary intake is essential for prevention and management in these patients [9]. Several studies suggest that plant-based diets may protect kidney health and help in both the prevention and slowing of CKD [10]. Most clinical guidelines also recommend lowering protein intake, since high-protein diets can accelerate kidney damage [11]. For healthy adults, the World Health Organization (WHO) advises a safe daily protein intake of 0.83 g per kilogram of body weight [12]. Proper nutritional management in CKD can also improve growth, fluid balance, mineral and bone health, and reduce uremic symptoms [13]. A balanced diet further supports the control of common coexisting conditions such as hypertension and cardiovascular disease [14]. Maintaining normal serum potassium levels is another key component of care [15]. Although dietary restrictions related to sodium, protein, potassium, phosphorus, and fluids are widely recommended, the overall benefits of these specific limitations on CKD progression and cardiovascular outcomes remain uncertain [16,17]. Epidemiological studies, however, have established clear links between dietary patterns and CKD risk [18], emphasizing that appropriate dietary interventions can help prevent or slow disease progression [19]. This study was conducted to assess the level of knowledge regarding dietary intake among patients with CKD in tertiary care hospitals of Peshawar. The findings are expected to highlight existing educational gaps and guide healthcare professionals-especially nurses and dietitians in developing more effective nutritional education strategies for these patients.

Operational Definitions**Chronic Kidney Disease (CKD):**

In this study, CKD refers to a condition diagnosed by a qualified physician, characterized by a gradual and irreversible decline in kidney function. It includes patients in stages 1 to 5 who are currently receiving medical care.

Dietary Intake:

Dietary intake refers to the types and amounts of food and fluids consumed by patients with CKD, with particular focus on nutrients such as protein, sodium, potassium, phosphorus, and fluid intake, as recommended for renal health.

Knowledge Regarding Dietary Intake:

This term describes the level of awareness and understanding CKD patients have about dietary recommendations specific to their condition. It was assessed using a structured questionnaire that included items on recommended foods, dietary restrictions, and the potential consequences of non-adherence.

CKD Patient:

A CKD patient is defined as an adult aged 18 years or older who has been diagnosed with chronic kidney disease for at least three months and is currently receiving inpatient or outpatient treatment.

Methodology:**Study Design:**

This study used a descriptive cross-sectional design.

Study Setting:

The study was conducted at three major public-sector tertiary care hospitals in Peshawar: Khyber Teaching Hospital (KTH), Lady Reading Hospital (LRH), and the Institute of Kidney Diseases (IKD).

Study Duration: Data collection was carried out over a period of **two month and ten days**, between **August 1 and October 10, 2025**.

Study Population: The study population were consisted of adult patients diagnosed with Chronic Kidney Disease (CKD). These patients were either attending outpatient nephrology clinics or admitted to nephrology wards during the study period in the selected hospitals.

Inclusion Criteria:

Patients included in the study in the following criteria:

- Diagnosed with CKD (as per medical records)
- Aged 18 years or older
- Receiving treatment or follow-up at KTH, IKD or LRH
- Willing to participate and provide informed consent

- Able to understand and respond to the questionnaire

Exclusion Criteria:

Patients were excluded from the study if they met the following criteria:

- CKD patients and are critically ill or hemodynamically unstable
- CKD patients who have cognitive impairment, dementia, or severe psychiatric illness that affects their ability to respond accurately
- CKD patients who Refuse to participate or withdraw consent

Sample Size:

The sample size for this study was calculated using the Raosoft Sample Size Calculator based on the number of total CKD patients in the above mentioned hospitals with confidence level **95% and** margin of error **5%**.

Data Collection Tool:

Data were collected using a structured questionnaire adapted from a previously published study (20). The questionnaire was reviewed and modified to fit the local context and study objectives. Prior to the main data collection, a **pilot study** was conducted to assess the clarity and reliability of the instrument. The pilot results showed a satisfactory Cronbach's alpha value, confirming internal consistency. After ensuring reliability, the final version of the questionnaire was used for data collection among the study participants having two sections;

- Demographic Information
- Knowledge Regarding Dietary Intake in CKD

Sampling Technique:

A **non-probability convenience sampling** technique was used for this study.

Data Analysis:

The collected data was entered and analyzed using (SPSS) **version 26**.

Ethical Considerations

1. Ethical Approval:

Prior to data collection, ethical approval was obtained from the **Institutional Review Board (IRB)** or **Ethical Committee** of the Nice College of Nursing.

2. Informed Consent:

Written informed consent was obtained from all participants.

3. Confidentiality and Anonymity:

All information collected will be kept strictly confidential.

4. Voluntary Participation:

Participation was entirely voluntary.

Results:

A total of 152 participants were included in the study. The largest age group was 30–40 years (25.0%); 56.6% were male and 80.3% were married. Nearly half had no formal education (48.0%), and 62.5% reported a monthly income below 20,000 PKR. Most participants lived in rural areas (58.6%). Clinically, the largest group had been diagnosed for 1–3 years (45.4%); CKD stages were mainly stage 1 (30.3%) and stage 2 (28.9%). Hypertension was the most frequent comorbidity (44.1%). Seventy-five percent reported currently being on dialysis.

Knowledge about dietary management of CKD was moderate at the sample level. Using the 14 knowledge items identified from the SPSS output, the mean percent correct across items was 68.8% (SD 9.7). Participants showed the strongest knowledge for the role of diet in CKD progression (84.2% correct) and the need to limit fluid intake when appropriate (82.2% correct). Knowledge was lowest for the item on smoking and alcohol worsening kidney function (46.1% correct) and for the effects of excess red meat (55.9% correct). Self-rated knowledge was: good 57.9%, fair 32.2%, and poor 9.9%. Most participants (86.8%) expressed interest in receiving more education from their health care team.

Table 1: Shows Socio-Demographic Characteristics of Participants (N = 152)

Variable	Categories	Frequency (n)	Percentage (%)
Age (years)	18–30	23	15.1
	30–40	38	25.0
	40–50	36	23.7
	50–60	29	19.1
	>60	26	17.1
Gender	Male	87	56.6
	Female	65	42.1
Marital Status	Single	28	18.4
	Married	124	80.3
Education Level	No formal education	73	48.0
	Primary	36	23.7
	Secondary	27	17.8
	Higher education	16	10.5
Monthly Income	< 20,000	95	62.5
	20,000–40,000	36	20.4
	40,000–60,000	10	4.6
	> 60,000	10	4.6
Place of Residence	Rural	90	58.6
	Urban	62	40.1

Duration of CKD	< 1	43	28.3
	1-3	69	45.4
	4-6	20	13.2
	> 6	20	12.5
Stage of CKD	Stage 1	46	30.3
	Stage 2	44	28.9
	Stage 3	26	17.1
	Stage 4	21	10.5
	Stage 5	15	6.6
Comorbidities	Hypertension	67	44.1
	Diabetes Mellitus	48	28.3
	Cardiovascular Diseases	27	14.5
	Others	10	2.0
Currently on Dialysis	Yes	115	75.0
	No	37	23.7

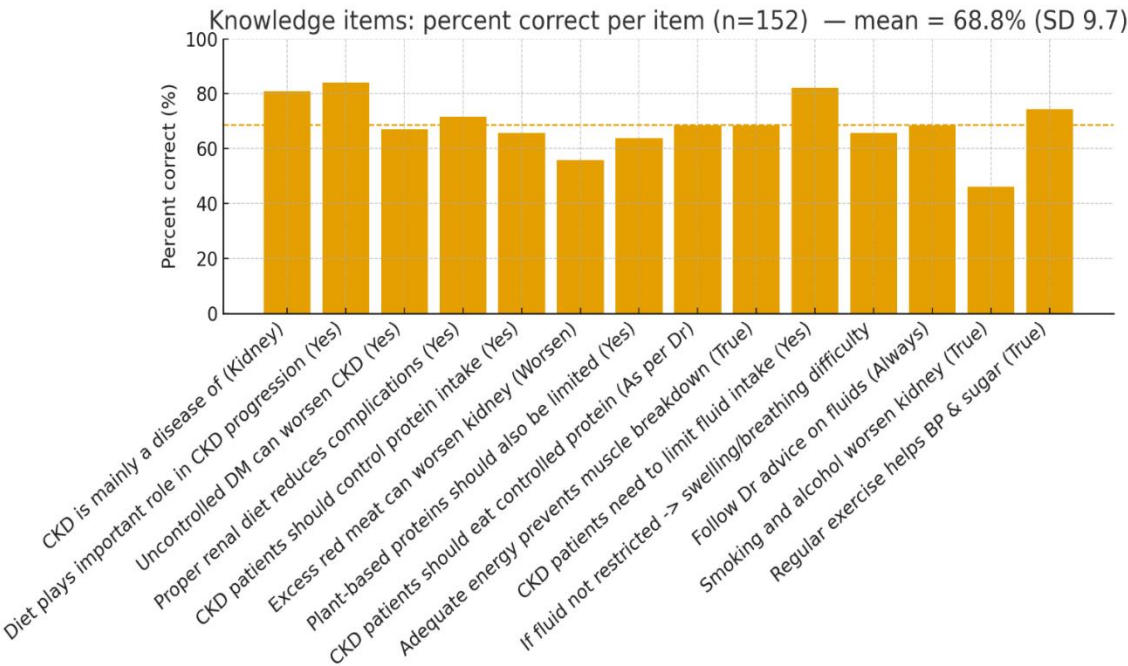


Fig.2 shows Determination of Dietary Knowledge in Patients of Chronic Kidney Disease

Discussion:

This study evaluated the degree of dietary awareness among CKD patients who were receiving treatment at Peshawar's tertiary care hospitals. Overall, individuals' understanding of food intake was moderate, according to the data. The importance of nutrition in controlling chronic kidney disease (CKD) was well understood by the participants, as seen by the reduction of salt and fluid intake. However, their knowledge of particular nutrient restrictions, such as those pertaining to potassium, phosphorus, and protein sources, was lacking. These results imply that although the majority of patients grasp the fundamentals of nutrition, there are still large gaps in their knowledge of renal diet management. According to Saher et al. (20), CKD patients in Lahore were only partially aware of the renal diet recommendations; they understood general dietary control better but electrolyte restrictions poorly. According to Khan et al. (21), patients had inadequate awareness and adherence to dietary recommendations, despite their recognition of significant risk factors such as diabetes and hypertension. These studies, along with our findings, suggest that patient education initiatives frequently prioritize raising awareness of the disease above offering helpful dietary advice. However, according to a study that was published in Medicine (22), almost 80% of patients with chronic kidney disease (CKD) showed a lack of knowledge regarding foods high in potassium and dietary potassium management. This is in contrast to our findings, which may be the consequence of different study designs and objectives. The higher average knowledge scores may be explained by the fact that our study examined a wider range of nutritional areas, whereas theirs only evaluated

information pertaining to potassium. This study found a modest level of knowledge, which might be explained by a number of causes. Since over half of the participants lacked formal education, it may be more difficult for them to understand complicated dietary recommendations. This finding can perhaps be attributed to limited access to educational resources and dietitians, particularly for rural communities. Prior research has also observed that nutritional awareness among CKD patients is significantly influenced by residence and educational attainment (20, 21). Overall, **57.9% of participants in this study rated their own knowledge as good**, but **86.8% expressed interest in receiving further education** from their healthcare providers. This highlights a positive attitude toward learning and underscores the necessity of patient education programs that are easy to use, culturally appropriate, and customized for different reading levels.

Conclusion:

This study found that most CKD patients in Peshawar's tertiary hospitals had limited knowledge about dietary management. While many were aware of general food restrictions, few understood the specific limits for nutrients such as protein, potassium, and phosphorus. Factors like lower education levels and rural residence may contribute to this gap. Strengthening patient education through simple, culturally tailored, and dietitian-led programs could significantly improve dietary knowledge and self-management among CKD patients.

REFERENCES:

- Levey AS, Coresh J, Bolton K, Culleton B, Harvey KS, Ikizler TA, Johnson CA, Kausz A, Kimmel PL, Kusek J, Levin A. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. *American Journal of Kidney Diseases*. 2002;39(2 SUPPL. 1):i-i+.
- Levey AS, Coresh J, Balk E, Kausz AT, Levin A, Steffes MW, Hogg RJ, Perrone RD, Lau J, Eknoyan G. National Kidney Foundation practice guidelines for chronic kidney disease: evaluation, classification, and stratification. *Annals of internal medicine*. 2003 Jul 15;139(2):137-47.
- Kim SM, Kim MH, Ryu DR, Oh HJ. The dietary intake of chronic kidney disease according to stages: Findings from the Korean National Health and Nutritional Examination Survey. *Plos one*. 2021 Nov 29;16(11):e0260242.
- Somaili M, Akoor A, Refaei E, Deibaji M, Aqeel AA, Ghulaysi S, Areeshi AS, Mobaraki RA, Qadah EA, Gharwi N, Madkali A. Cross-sectional study for assessment of knowledge, attitudes and practices of chronic kidney disease patients toward potassium-rich diet intake in Jazan-Saudi Arabia. *Medicine*. 2025 May 9;104(19):e42260.
- Ahmed J, Azhar S, ul Haq N, Hussain S, Stájer A, Urbán E, Gajdács M, Jamshed S. Awareness of chronic kidney disease, medication, and laboratory investigation among nephrology and urology patients of Quetta, Pakistan. *International Journal of Environmental Research and Public Health*. 2022 Apr 20;19(9):5015.
- Almutary HH. Assessment of kidney disease knowledge among chronic kidney disease patients in the Kingdom of Saudi Arabia. *Journal of Renal Care*. 2021 Jun;47(2):96-102.

- Hasan H, Rahman MH, Haque MA, Rahman MS, Ali MS, Sultana S. Nutritional management in patients with chronic kidney disease: A focus on renal diet. *Asia Pacific Journal of Medical Innovations*. 2024 Aug 31;1(1):34-40.
- Bross R, Noori N, Kovesdy CP, Murali SB, Benner D, Block G, Kopple JD, Kalantar-Zadeh K. Dietary assessment of individuals with chronic kidney disease. In *Seminars in dialysis* 2010 Jul (Vol. 23, No. 4, pp. 359-364). Blackwell Publishing Ltd.
- Chauveau P, Koppe L, Combe C, Lasseur C, Trolonge S, Aparicio M. Vegetarian diets and chronic kidney disease. *Nephrology Dialysis Transplantation*. 2019 Feb 1;34(2):199-207.
- Kim SM, Jung JY. Nutritional management in patients with chronic kidney disease. *The Korean journal of internal medicine*. 2020 Sep 23;35(6):1279.
- Gebretsadik GG, Mengistu ZD, Molla BW, Desta HT. Patients with chronic kidney disease are not well adhered to dietary recommendations: a cross-sectional study. *BMC nutrition*. 2020 Dec;6:1-7.
- Kalantar-Zadeh K, Fouque D. Nutritional management of chronic kidney disease. *New England Journal of Medicine*. 2017 Nov 2;377(18):1765-76.
- Betz M, Steenes A, Peterson L, Saunders M. Knowledge does not correspond to adherence of renal diet restrictions in patients with chronic kidney disease stage 3-5. *Journal of Renal Nutrition*. 2021 Jul 1;31(4):351-60.
- Sumida K, Biruete A, Kistler BM, Khor BH, Ebrahim Z, Giannini R, Sussman-Dabach EJ, Avesani CM, Chan M, Lambert K, Wang AY. New insights into dietary approaches to potassium management in chronic kidney disease. *Journal of Renal Nutrition*. 2023 Nov 1;33(6):S6-12.
- EDTNA/ERCA Dietitians' Special Interest Group. European guidelines for the nutritional care of adult renal patients [Internet]. 2002 [cited 2020 Aug 26]. Available from: http://www.spitjudms.ro/files/protocoale_terapeutice/nefrologie/diet_dietguid.pdf.
- Ash S, Campbell K, MacLaughlin H, McCoy E, Chan M, Anderson K, et al. Evidence based practice guidelines for the nutritional management of chronic kidney disease. *Nutr Diet*. 2006;63(Suppl 2):S33-45.
- Ash S, Campbell KL, Bogard J, Millichamp A. Nutrition prescription to achieve positive outcomes in chronic kidney disease: a systematic review. *Nutrients*. 2014 Jan 22;6(1):416-51.
- Cheung CL, Sahni S, Cheung BM, Sing CW, Wong IC. Vitamin K intake and mortality in people with chronic kidney disease from NHANES III. *Clinical nutrition*. 2015 Apr 1;34(2):235-40.
- Jankowska M, Szupryczyńska N, Dębska-Ślizień A, Borek P, Kaczkan M, Rutkowski B, Małgorzewicz S. Dietary intake of vitamins in different options of treatment in chronic kidney disease: is there a deficiency?. In *Transplantation proceedings* 2016 Jun 1 (Vol. 48, No. 5, pp. 1427-1430). Elsevier.
- Khalid S, Saher S, Aslam M. Determination of Dietary Knowledge among Patients Suffering from Chronic Renal Failure. *Lahore Garrison University Journal of Life Sciences*. 2022 Mar 25;6(01):15-21.

- Al-Zaman N, Alem A, Alharbi OA, Abdullah EA, Azouni DW, Hammad RK, Alhejaily RM, Albadrani M, Abdullah EA. Physicians' Knowledge, Attitudes and Barriers Regarding Chronic Kidney Disease Diagnosis and Management in Saudi Arabia. *Cureus*. 2023 Dec 9;15(12).
- Somaili M, Akoor A, Refaei E, Deibaji M, Aqeel AA, Ghulaysi S, Areeshi AS, Mobaraki RA, Qadah EA, Gharwi N, Madkali A. Cross-sectional study for assessment of knowledge, attitudes and practices of chronic kidney disease patients toward potassium-rich diet intake in Jazan-Saudi Arabia. *Medicine*. 2025 May 9;104(19):e42260.