LGJDX ISSN No: 1008-0562 Journal Of Liaoning Technical University Natural Science Edition

KNOWLEDGE OF KIDNEY DISEASE AND COMPLIANCE TO TREATMENT REGIMEN AMONG RENAL PATIENTS ATTENDING TWO SELECTED TEACHING HOSPITAL IN OGUN STATE

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Abstract

Kidney disease is a progressive condition that can lead to severe complications like cardiovascular disease, anemia, and electrolyte imbalances. Inadequate knowledge and non-compliance with treatment regimens exacerbate these issues, increasing morbidity, mortality, and hospitalizations, thereby diminishing patients' quality of life. This study evaluated the knowledge of kidney disease, compliance with treatment regimens, and influencing factors among renal patients at Olabisi Onabanjo University Teaching Hospital (OOUTH) and Babcock University Teaching Hospital (BUTH) in Ogun State. Using a descriptive cross-sectional design, 340 renal patients were surveyed through self-structured questionnaires. Data analysis with SPSS 23.0 showed that 65.7% of respondents were female, primarily aged 26-35. Employment status indicated that 51.4% were employed, with 34.2% earning N50,000 - N100,000. The study found a high level of knowledge about kidney disease (mean 1.35, 50.0%±0.45) and moderate compliance with treatment regimens (mean 2.53, 44.0%±0.855). Significant differences were observed in knowledge and compliance between the two hospitals (Mean diff. = 0.03, t(339) = 43.21, p = .000). The study recommends awareness programs to enhance knowledge and adherence among renal patients and their families.

Keywords: Knowledge, Kidney, Disease, Compliance, Regimens Renal patients

Introduction

Kidney disease results from impaired renal function, causing fluid and waste buildup in the body and leading to various health issues such as heart disease, stroke, anaemia, sepsis, electrolyte imbalance, and depression. It progresses through multiple stages and can deteriorate over time, potentially leading to renal failure if untreated, necessitating dialysis or kidney transplantation to sustain life. End-stage renal disease (ESRD) is managed through these interventions. Effective management of kidney disease requires patients to understand their condition and adhere to their treatment plan, significantly influencing outcomes.

Kidney illness has emerged as an important worldwide health issue, affecting millions of people and placing a considerable strain on healthcare systems worldwide. According to Kidney Disease: Improving Global Outcomes (KDIGO) [1], approximately 10% of the world's population is affected by this condition. Kidney illness has become a widespread and unnoticed epidemic, affecting various communities worldwide. Based on the Global Burden Disease Study, there has been a consistent rise in the occurrence of renal disease, which has had a substantial impact on the overall burden of disease worldwide[2]. The rise in KD cases can be linked to several factors, including an ageing population, changes in lifestyle, and a higher occurrence of illnesses like diabetes and hypertension, which are significant factors in the development of KD[3]. The recognition of this significant cost is relatively recent and remains partial. Regrettably, the diverse and extensive impact of kidney disease, including its frequency, morbidity, mortality, and costs, is seeing significant growth, especially in low-income countries as stated by KDIGO in 2024. The comprehensive analysis reveals that, as expected from such a substantial endeavour, certain outcomes give rise to inquiries or indicate constraints.

The occurrence of kidney illness in Nigeria is experiencing a concerning rise, highlighting the significance of acquiring accurate knowledge and adhering to treatment plans for individuals with kidney problems in the broader healthcare system. In Nigeria, the increasing prevalence of renal disease has emerged as a significant public health issue. Studies have indicated that Nigeria bears a significant burden of renal illness, with a prevalence rate of approximately 14.7% in both suburban and rural populations[4]. Key factors that contribute to this include a significant presence of risk factors such as hypertension, diabetes, and infectious diseases[4]. According to Chen et al.[5], the progression of renal failure can be significantly decelerated by early intervention in kidney illness.

Early treatment of kidney disease for cardiovascular risk factors has the potential to reduce cardiovascular disease events both prior to and following the onset of renal failure. Regrettably, kidney disease in Nigeria is frequently "underdiagnosed" and "undertreated" due to disputes on the definition and classification of the different stages of the disease. A clinically appropriate classification scheme would be developed to address missed opportunities for prevention of kidney disease. This scheme would be based on laboratory assessment of renal disease severity, correlation between kidney function level and problems, and risk stratification for kidney function loss and cardiovascular disease development. The emphasis should be placed on clinical practice guidelines, clinical performance measurements, and ongoing quality improvement initiatives in accordance with the stages of chronic kidney disease[6]

Evaluating the level of knowledge that patients possess about their kidney health and how to manage it is crucial to guaranteeing efficient self-care. Patients with greater knowledge ratings had considerably better disease outcomes, such as better medication adherence and fewer hospitalizations[7]. As a result, precise knowledge level evaluations can aid in identifying subject areas for instruction and in providing focused interventions. Patients' knowledge can be assessed using a variety of instruments, including checklists and standardized questionnaires made expressly to measure knowledge about kidney disease. Adherence to the recommended treatment plan is essential for the efficient management of renal disease. Poor clinical outcomes, higher healthcare expenses, and higher mortality rates have all been linked to non-compliance[5]. Murali [8] evaluating patient compliance and detecting possible obstacles are crucial measures in enhancing therapy compliance in kidney disease patients because reporting is subjective, assessing compliance can be difficult. Nonetheless, a number of techniques can be used to precisely assess treatment adherence. These consist of medication counts, pharmacy refill records, patient self-reports, and biomarker monitoring (e.g., serum drug levels).

The study conducted by [9]investigates the level of awareness among general outpatients regarding chronic diseases in a specific tertiary hospital located in Ondo state, Nigeria. The summary score for knowledge of chronic renal disease was determined based on each assessment item, which had a maximum score of 85. The mean score was 55.91, with a standard deviation of 16.47, out of a possible 100. The knowledge of the causes of the disease ranged from a minimum score of 0 to a maximum score of 100, with an average score of 59.44 and a standard deviation of 24.89.

Similarly, the knowledge of the clinical manifestations of the disease ranged from a minimum score of 0 to a maximum score of 100, with an average score of 71.17 and a standard deviation of 25.04. In summary, the survey revealed that the general population have a modest level of comprehension regarding chronic renal disease at a fundamental level.

Daniel[10] conducted significant research on the "Knowledge and practices among hypertensive patients in Gondar Town, North West Ethiopia towards the prevention and early detection of chronic kidney disease and its associated factors." The survey was completed by 434 out of 442 respondents, resulting in a response rate of 98.1%. Out of the entire number, 298 individuals (68.7%) and 210 individuals (48.4%) demonstrated a high level of understanding and application of information regarding chronic renal illness, with average scores of 8.78 ± 2.80 and 6.58 ± 1.61, respectively.

Anoohya [11]did a robust study on "Medication adherence in renal patients." The study involved a six-month prospective observational approach in India, utilising a questionnaire. The acquired data encompasses the demographic information, medical history, complaints, and prescriptions of renal patients. Additionally, the patients were interviewed using the Morisky adherence questionnaire to gather information about their drug usage. A study was conducted on a cohort of 300 individuals with renal conditions in the nephrology department. Based on the statistics, around 10% of the patients were fully compliant with the drugs, whereas 90% of the patients were not compliant. Out of the total number of patients, 66 (24%) were non-adherent due to forgetfulness regarding their meds, 49 (18.2%) were non-adherent because of frequent changes in their drug regimen, and 63 (23.4%) were non-adherent due to the high cost of medicines.

According to National Health Institute, non-compliance with the treatment regimen is common, and 20% to 86% of these patients with kidney disease have shown non-compliance in one or more aspects of therapeutic regimens but the median is near to 50%. Adherence to treatment regimen comprising drugs, dietary restrictions, and lifestyle modifications is crucial for the management of kidney disease. Studies have shown that higher patient awareness levels are linked to better drug compliance and fewer hospital admissions. In a similar vein, disregarding prescribed courses of action can seriously harm patients' health and raise medical expenses. The purpose of this study is to examine how patients with kidney disease assess their knowledge and adherence to treatment plans, emphasizing the value of thorough assessments and customized interventions. Olabisi

Onabanjo University Teaching Hospital (OOUTH) and Babcock University Teaching Hospital (BUTH) being the two tertiary healthcare institutions, is at the forefront of addressing renal health challenges in Ogun State. The efficacy of kidney disease management within the walls of OOUTH and BUTH is contingent not only on medical interventions but also on the level of awareness and compliance among renal patients. The significance of understanding the existing gaps in knowledge and compliance to treatment regimen among renal patient becomes paramount for implementing targeted interventions aimed at improving patient outcomes.

The main objective of this study is to assess knowledge of kidney disease and compliance to treatment regimens among renal patients attending Olabisi Onabanjo University Teaching Hospital Sagamu and Babcock University Teaching Hospital Ilishan Remo, Ogun State. The specific objectives include to:

1. assess knowledge of kidney disease among renal patients attending nephrology clinic of Olabisi Onabanjo University Teaching hospital and Babcock University Teaching Hospital.
2. assess the level of compliance to treatment regimens among renal patients attending nephrology clinic of Olabisi Onabanjo University Teaching hospital and Babcock University Teaching Hospital.

Research Hypothesis

There is a no significant difference between knowledge of kidney disease and compliance to treatment regimen among renal patients

Methodology

This study employs a descriptive survey design to examine the knowledge and compliance with treatment regimens among renal patients. The population includes renal patients attending nephrology clinics at Olabisi Onabanjo University Teaching Hospital (OOUTH) in Sagamu and Babcock University Teaching Hospital (BUTH) in Ilishan Remo, Ogun State. This population is strategically chosen to provide in-depth insights into kidney disease management within these specific healthcare settings. The clinics cater to 21-35 patients weekly at OOUTH and 20-25 at BUTH, with OOUTH clinics running on Thursdays and BUTH on Mondays and Fridays. Monthly attendance records for the past four months show OOUTH had 116 patients in November, 146 in

December, and 106 in January, while BUTH had 73 in November, 75 in December, and 89 in January.

The study included respondents diagnosed with kidney disease who were receiving treatment at the nephrology clinics of Olabisi Onabanjo University Teaching Hospital and Babcock University Teaching Hospital. Exclusion criteria comprised respondents who did not consent to the study, those under 18 due to consent form requirements, and pregnant women with renal diseases. The sample size was drawn from approximately 605 patients attending the nephrology clinics of both hospitals over three months, with 368 patients from Olabisi Onabanjo University Teaching Hospital and 237 from Babcock University Teaching Hospital based on hospital records over six months. Using Solvin's formula with a confidence level of 0.05, a sample size of 340 was determined. Simple random sampling technique was used to draw samples from the population. The allocated respondents was selected from Nephrology clinic of Olabisi Onabanjo University Teaching Hospital and Babcock University Teaching Hospital Ilishan Remo.

The study utilized a researcher-designed questionnaire, reviewed by the supervisor and field experts for accuracy, to ensure the reliability and validity of data collection. The questionnaire was translated into Yoruba by the research assistant to accommodate participants not proficient in English. It consisted of four sections based on validated scales and literature, aligned with the study's objectives. Section A covered socio-demographic characteristics with seven questions on age, gender, religion, education, employment, income, and diagnosis duration. Section B assessed patients' knowledge of kidney disease through fourteen yes/no questions, scoring knowledge from poor (1-7) to good (12-14). Section C evaluated compliance with treatment regimens using eight questions on medication adherence, lifestyle factors, and follow-up, scored from poor (1-10) to good (23-32).

To ensure the validity of the research instrument, both content and construct validity were addressed. Content validity was established by consulting nephrology experts and research methodology specialists during questionnaire development, ensuring comprehensive coverage of kidney disease (KD) knowledge and compliance dimensions. Construct validity was assessed through factor analysis to align questionnaire items with theoretical constructs. Reliability was ensured via a pilot study at University College Hospital Ibadan, using Cronbach's Alpha to confirm internal consistency, with values of $\alpha = 0.80$ for KD knowledge, and $\alpha = 0.79$ for treatment

regimen compliance. Data collection involved administering closed-ended self-administered questionnaires to renal patients at specified hospitals, with translations and assistance provided as needed, over three weeks. Analysis was conducted using SPSS version 25, employing descriptive statistics and t-tests, and following ethical guidelines to maintain participant confidentiality.

Results

Table 1: Socio-Demographic Characteristics of the Participants: [N=340]

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	116	34.3
	Female	224	65.7
Age	0-10yrs	20	5.7
	18-25yrs	99	28.6
	26-35yrs	114	34.3
	36-70yrs	107	31.4
Religion	Christianity	240	71.4
	Islam	69	20.0
	Traditional	20	5.7
	Others	10	2.9
Educational Level	Primary School	49	14.4
	Secondary School	142	41.8
	Tertiary and Others	149	43.8
Employment Status	Employed	179	51.4
	Unemployed	61	20.0
	Retired	58	15.6
	Students	42	14.0
Monthly Income Range	Below ₦50,000	97	28.7
	₦50,000- ₦ 100,000	114	34.2
	₦ 100,000- ₦ 150,000	78	22.8
	₦ 150,000 and above.	51	14.3
How long have you been diagnosed of kidney disease	less than 5 years	100	28.6
	5 – 10 years	78	22.9
	10 – 15 Years	68	21.0
	15 years and above.	95	28.5
Total		**340**	**100.0**

Table 1 presents the socio-demographic characteristics of renal patients in the study, showing 34.3% male and 65.7% female representation, indicating a higher prevalence among females. The majority of patients were aged 18-25 (28.6%) and 26-35 (34.3%), suggesting a younger affected population. Christianity was the predominant religion (71.4%), followed by Islam (20.0%), with

minor representation from other religions. Educationally, 42.86% had secondary and 42.86% had tertiary education, with 14.29% having only primary education. Employment status showed 51.4% employed, 20.0% unemployed, 15.6% retired, and 14.0% students. Income levels varied, with 34.2% earning N50,000-N100,000 monthly and 22.8% earning N100,000-N150,000. Diagnosis duration was evenly spread: 28.6% diagnosed less than 5 years ago, 22.9% between 5-10 years, 21.0% between 10-15 years, and 28.5% over 15 years ago.

Table 2: Knowledge of kidney disease among renal patients attending nephrology clinic

Statements	Yes	No	Mean	Std
Have you ever heard of kidney disease?	244(71.6)	96(28.4)	1.716	0.45
Are you diagnosed with kidney disease?	291(86)	49 (14)	1.43	0.49
Were you diagnosed of kidney disease through the following			0.0	0.0
-. By blood test	236(67.3)	114(32.7)	1.48	0.50
Have you been told what caused your kidney disease?	201 (57.4)	139 (42.6)	1.15	0.36
Is kidney disease a condition in which the kidneys are damaged?	291 (86.0)	49 (14.0)	1.43	0.49
Is smoking, alcohol consumption, bad dietary pattern, lack of exercise and obesity contribute to development of kidney disease?	246 (71.6)	94(28.4)	1.716	0.45
Does diabetes, hypertension, anemia, dyslipidemia cause kidney disease?	291(86.0)	49 (14.0)	1.43	0.49
Do you have other Comorbidities (e.g., diabetes, hypertension)?	191(57.4)	149 (42.6)	1.15	0.36
Have you ever had any of the following:				
-Bladder or other urologic surgery?	306(88.8)	34(11.2)	1.88	0.20
Have you received information about (KD) from your healthcare provider?	291(86)	49 (14)	1.43	0.49
Did you know at least three complications associated with KD?	241(71.7)	99 (28.3)	0.94	0.24
Have you use pain or anti-inflammatory relieve medications before (i.e. Paracetamol, naproxen,	340 (100.0)	0(0.0)	0(0.0)	0(0.0)

ibuprofen?				
Do you use herbal supplements?	201 (57.4)	139 (42.6)	1.48	0.50
Total Weighted Average Mean			1.35	0.45

*Decision rule: 0.1-0.9 = No; 1.0-1.9=Yes

Table 2 presents data on renal patients' knowledge of kidney disease, revealing that 71.6% of respondents have heard of the condition, indicating high awareness, with a mean response of 1.72. A significant 86% have been diagnosed with kidney disease, primarily diagnosed through blood tests (mean=1.48). Most respondents (86%) correctly understand kidney disease as kidney damage, with a consistent mean response of 1.43. They identify smoking, alcohol, poor diet, lack of exercise, and obesity as risk factors (71.6%, mean=1.72), and recognize diabetes, hypertension, anemia, and dyslipidemia as contributing conditions (86%, mean=1.43). Bladder or urologic surgery is a common kidney-related issue (mean=1.88). Additionally, 86% received information from healthcare providers, 77.7% are aware of at least three complications (mean=1.94), 100% have used pain or anti-inflammatory medications, and 57.4% use herbal supplements (mean=1.48).

Table 3: **Respondent's Summary of Knowledge on Kidney Disease**

Value	**Df**	**Frequency**	**Percent (%)**	**Perception**
Mean score = 1.35±0.45	1	52	15.9	Poor Knowledge
		123	35.1	Fair Knowledge
		175	50.0	Good Knowledge
Total		**340**	**100.0**	

Table 3 reveals that renal patients at Olabisi Onabanjo University Teaching Hospital Sagamu and Babcock University Teaching Hospital Ilishan Remo, Ogun State, exhibit a relatively high level of knowledge and understanding regarding kidney disease, its causes, diagnosis methods, and associated risk factors. Measured on a 2-point Likert scale, their awareness was rated at 1.35

(50.0%) ± 0.45, indicating that the majority of these patients possess good knowledge about kidney disease.

Table 4: Compliance To Treatment Regimen On Kidney Disease

Questions	Regular	Often	Seldom	Rarely	Mean	Std
Do you sometimes forget to take your medications?	93 (27%)	111 (35%)	79 (23%)	57 (16%)	2.18	0.83
Have you ever stopped taking your medication without HCP consent?	94(28%)	83 (24%)	67 (19%)	96(29%)	1.85	0.96
Did you smoke or drink alcohol?	70 (20%)	50 (14%)	98 (28%)	122(38%)	2.85	0.91
How confident are you in managing your KD dietary regimen...?	111(35%)	80 (23%)	99 (28%)	50 (14%)	3.03	0.89
How often do you adhere to your prescribed treatment regimen?	130(40%)	71 (20%)	80 (23%)	59 (17%)	3.00	0.93
How often do you attend clinic for medical checkup?	96(29%)	82 (23%)	86(26%)	76 (22%)	2.41	0.64
How frequently do you attend your scheduled dialysis sessions...?	52 (15%)	102 (29%)	122 (35%)	74 (21%)	2.40	0.85
Have you ever missed a scheduled dialysis session?	70 (20%)	97(29%)	61 (17%)	112(34%)	2.59	0.82
Average Weighted Mean					**2.53**	**0.85**

*Decision rule: 0.1-0.9=rarely, 1.0-1.9=seldom; 2.0-2.9=often; 3.0-3.9=regular

Table 4 summarizes respondents' compliance with their kidney disease treatment regimen. It reveals that 27% of respondents occasionally forget to take their medications, with a mean response of 2.18, and 29% have stopped their medication without healthcare provider consent, with a mean response of 1.85. A significant majority (38%) do not smoke or drink alcohol, indicated by a mean value of 2.85. Additionally, 35% of respondents feel confident in managing their dietary regimen, reflected by a mean response of 3.03. Regular adherence to prescribed treatments is observed in 40% of respondents, with a mean response of 3.00. Clinic attendance for medical checkups shows a moderate level, with 26% attending often and a mean response of 2.41. Dialysis session attendance is varied, with 35% attending frequently and a mean value of 2.40,

while 34% have missed a scheduled session, indicated by a mean response of 2.59 and a standard deviation of 0.82..

Table 5: Respondent's Summary of Compliance to Treatment Regimen on Kidney Disease

Value	Df	Frequency	Percent (%)	Perception
Mean score = 2.53±0.85	3	78	22.0	Low Level
		149	44.0	Moderate Level
		113	34.0	High Level
Total		**340**	**100.0**	

Table 5 summarizes the compliance of renal patients to their treatment regimens at Olabisi Onabanjo University Teaching Hospital Sagamu and Babcock University Teaching Hospital Ilishan Remo, Ogun State. The data indicate varying levels of compliance, with the majority of respondents showing moderate adherence. This was assessed using a 4-point Likert scale, yielding a total weighted average mean of 2.53 (44.0%) ±0.855. The analysis concludes that most renal patients at these hospitals exhibit a moderate level of compliance with their treatment regimens..

Testing of Hypothesis

Hypothesis 1: There is no significant difference between knowledge of kidney disease and compliance to treatment regimen among renal patients

Table 6: t-test analysis for mean score comparison between knowledge of kidney disease and compliance to treatment regimen among renal patients attending OOUTH and BUTH

Facility	N	Mean ±SD	Mean difference	Std. error mean	t.value {df}	P	Dec.
OOUTH	199	0.70±0.154					Reject the

BUTH	141	0.74±0.105	0.03	0.097	43.21 {339}	0.000	Hypothesis

Table 6 presents the result of hypothesis one postulated in this study. It is indicated that there is a difference in the mean knowledge of kidney disease and compliance to treatment regimen among renal patients attending OOUTH (0.70±0.154) and BUTH (0.74±0.105). (Mean diff. = 0.03, $t_{(339)}$ = 43.21, p = .000). It is also indicated that the p-value is 0.000 and this justifies the significance difference that exist between the knowledge of kidney disease and compliance to treatment regimen among renal patients attending OOUTH and BUTH. Therefore, the difference observed in the knowledge of kidney disease and compliance to treatment regimen among renal patients attending OOUTH and BUTH could not have happened by chance but due to the good knowledge and moderate compliance of the respondents to the treatment of the kidney disease.

Discussion of findings

The findings indicate that the respondents possess a considerable level of knowledge and comprehension regarding kidney disease, including its causes, methods of diagnosis, and related risk factors. This discovery aligns with the findings of [12], who conducted a cross-sectional study investigating the intricate relationship between patients suffering from advanced chronic kidney disease and their perception of the condition's objective aspects and their knowledge about it. The individuals were monitored in a comprehensive kidney disease clinic in Ontario, Canada. The findings of this study offer significant novel insights into the dynamic relationship between patients' perceptions and comprehension of their condition, and how these factors influence their adherence to treatment recommendations for advanced chronic renal disease. The findings do not support those of [9], who conducted a study on the awareness of chronic diseases among general outpatients in a selected tertiary hospital in Ondo state, Nigeria. Their study revealed that the general public had a moderate level of understanding about chronic kidney disease at a basic level.

The data indicates that a significant number of renal patients attending Olabisi Onabanjo University Teaching Hospital Sagamu and Babcock University Teaching Hospital Ilishan Remo, Ogun State, have a moderate level of compliance. This finding differs from the study conducted by [13] on the quality of life and medication adherence of patients with chronic kidney disease. Their

investigation showed a high adherence rate of 80% during the initial visit, which later increased to 85.7% after patient counselling during the final review. The findings do not align with those of [11] who did a rigorous investigation on "Medication adherence in renal patients." Their study involved a six-month prospective observational study conducted in India, utilising a questionnaire. A total of 269 patients, accounting for 90% of the sample, were found to be non-adherent to their prescriptions, showing a significant level of non-compliance.

There is a disparity in the average level of understanding of kidney disease and adherence to treatment plans among renal patients who visit OOUTH and BUTH. Daniel[10] conducted significant research on the "Knowledge and practices among hypertensive patients in Gondar Town, North West Ethiopia regarding the prevention and early detection of chronic kidney disease and its associated factors." Their findings aligned with those of the current investigation. The results revealed a significant disparity in the average knowledge and practice of chronic renal disease, with mean scores of 8.78 ± 2.80 and 6.58 ± 1.61, respectively. The finding is consistent with the research completed by [14]

Conclusion

The research conducted at Olabisi Onabanjo University Teaching Hospital Sagamu and Babcock University Teaching Hospital Ilishan Remo, Ogun State, has yielded significant findings regarding the awareness of kidney disease and adherence to treatment plans among renal patients. This study sheds light on the comprehension, difficulties, and determinants that impact compliance with treatment regimens for managing kidney disease. Moreover, the findings indicate that respondents have a relatively high level of knowledge and understanding regarding kidney disease. They are aware of its causes, diagnosis methods, and associated risk factors. This suggests that educational programs and information dissemination efforts have been somewhat effective in equipping renal patients with the necessary knowledge about their condition.

Additionally, the analysis reveals a moderate level of compliance among the majority of renal patients. Compliance refers to the extent to which patients follow healthcare provider recommendations, particularly in terms of medication adherence and lifestyle modifications. Despite the moderate level of compliance, there are factors identified in the study that significantly impact adherence to treatment regimens.

Recommendations

The study conducted at Olabisi Onabanjo University Teaching Hospital Sagamu and Babcock University Teaching Hospital Ilishan Remo, Ogun State, has identified several recommendations to enhance patient outcomes and improve adherence to treatment regimens among renal patients with kidney disease:

- Comprehensive education and awareness programs should be developed and implemented for renal patients and their families to enhance their knowledge and understanding of kidney disease, its management, and the importance of treatment adherence. Utilize various platforms such as workshops, seminars, informational materials, and digital resources to disseminate accurate and easily understandable information about kidney disease.

- Medication regimens should be evaluated and streamlined to minimize complexity and reduce the burden of kidney disease pills on patients. Provide clear instructions and tools for medication management, including reminders and pill organizers, to help patients adhere to prescribed treatment schedules.

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