

## Assessment of Current Medication Therapy and Quality of Life in Chronic Kidney Disease Patients

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### Abstract

**Background:** The burden of chronic kidney disease (CKD) is rising globally. CKD is often associated with multiple comorbidities which pose the risk of mortality and morbidity and are responsible for disease progression affecting the individuals' quality of life. In order to slow the disease progression and treat the multiple comorbidities, patients with CKD are often faced with polypharmacy which is one of the leading problems in renal medicine as it is associated with potential drug-drug interactions, greater healthcare costs, and low medication adherence. This study assesses the current medication therapy in CKD to understand polypharmacy, the current prescribing patterns, and the potential drug-drug interactions. Additionally, the quality of life in CKD patients has also been assessed.

**Keywords:** Chronic kidney disease; Hypertension; Diabetes mellitus; End stage renal disease

### Literature review

1. In a study titled "Pharmacotherapy Assessment In Chronic Kidney Disease: Validation Of Pair Instrument For Use In Brazil" conducted by Alessandra Batista Marquito, Helady Sanders Pinheiro and Rogerio Baumgratz de Paula, the authors state that patients with chronic kidney disease are prone to the use of polypharmacy which along with renal impairment may lead to drug related problems. The study throws light on the need to validate the therapeutic regimen given to patients having chronic kidney disease with comorbidities.

2. In a study titled "Assessment Of Treatment Burden And Its Impact On Quality Of Life In Dialysis Dependiant Patient And Pre-Dialysis Ckd Patients" conducted by Asmaa Al-Mansouri et al. Res Social Adm Pharm, the data explains how management of chronic kidney disease causes treatment burden to patients receiving dialysis and how their quality of life is affected as compared to pre dialysis patients receiving similar treatment measures. This study showcases that patients on hemodialysis indicate higher treatment burden and deterioration in their quality of life as compared to pre dialysis patients who showed lower treatment burden and much improved quality of life.

### Introduction

The kidneys play a crucial role in maintaining overall health in human beings but their importance in preserving general health is only recognized until after they have been damaged and are unable to perform their functions [1]. The kidney is a remarkably intricate organ that serves as the body's filtering system and is also vital in maintaining the chemical equilibrium of your entire body [2-7]. Other important functions of the kidneys include regulating pH levels and blood pressure, synthesizing the hormone erythropoietin that leads to the formation of red blood cells, and keeping your bones healthy by making the active form of Vitamin D.

### Aims

1. To conduct a drug utilisation review and evaluate the prescription patterns in chronic kidney disease patients.
2. To assess the quality of life in CKD patients.

### Objectives

1. To identify the polypharmacy associated with CKD patients.

2. To assess the impact of prescribing patterns in patients with or without dialysis.
3. To assess the quality of life in patients with CKD via a survey.
4. To study the impact of CKD on the sleeping, eating, and social patterns of the patients.
5. To assess the effects of comorbidities on the past and existing conditions of the patients.
6. To evaluate whether the prescribing patterns in patients comply with standard international practices.

### Methodology

The study that has been conducted is a prospective observational study in chronic kidney disease patients with several other comorbidities. This study was carried out for a period of eight months and the enrolment began in August 2022 and ended in February 2023. For this study, 120 CKD patients were enrolled, and 59 CKD patients were interviewed for the purpose of assessing their quality of life. These patients were all of Indian origin.

### Study site

The study and the survey were conducted in the Department of Nephrology, Star Hospital, Hyderabad, Telangana, India.

### Study duration

The study was conducted for a period of 6 months from August, 2022 to February, 2023.

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## Study design

The study is a prospective observational study.

## Sample size

The sample size of the study population was calculated based on the overall prevalence of Chronic Kidney Disease in the Indian population. An estimate of that magnitude with 95% confidence limits required a sample size of 138. With around 10% allowance for any dropouts, the calculated sample was 120.

## Data collection

Written consent was obtained from each patient. Clinical information and biological specimens of the patients were collected upon admission. The demographic data (age, gender, etc.), along with the medical history (comorbidities) were documented. The biological parameters included were serum creatinine, blood urea, eGFR, serum sodium, serum potassium and serum chloride and they were tested in the hospital laboratory to avoid testing variations among other laboratories. The diagnosis of Chronic Kidney Disease was made on the basis of the biochemical parameters and the clinical findings.

## Sources of data

The data was collected using specially designed patient profile forms that included all the needed parameters for the study. Additionally, the survey contained twelve questions each having 3 - 5 multiple choice options as answers.

## Selection criteria

### Inclusion criteria

1. Patients both male and female above the age of 18 years who are ready to give informed consent are included.
2. Patients diagnosed with Chronic Kidney Disease with and without dialysis.
3. Patients who are diagnosed with cardiovascular, endocrinological, respiratory disorders, anaemia as secondary complications in CKD.

### Exclusion criteria

1. Patients who were not able to give informed consent.
2. Patients under the age of 18 years.
3. Pregnant and lactating women.
4. Patients with viral diseases like HIV and Hepatitis.

## Results

1. The highest population of patients belonged to the 68 - 77 years age group (18%), while 73 of the total patients were males.
2. The most common CKD stage was Stage 5 with 34% of the patients being diagnosed with it. 86 patients were on dialysis, while 53% of the population (n = 63) were on haemodialysis and 19% of the patients (n = 23) were on peritoneal dialysis.
3. The most common comorbidity was hypertension, with 64% of the population (n = 77) being diagnosed. 52% of the patients were hospitalized for less than or equal to 5 days.
4. Higher level of serum creatinine was observed in 79% (n = 95) of the patients.

5. The number of drugs prescribed increased with the age of the patients and an increase in the age of the patients led to a longer stay in the hospital. Polypharmacy also led to an increase in the hospital stay of the patients. 68% of the patients were at the risk of developing moderate adverse effects from their medication therapy.

## Conclusion

In conclusion, the study was aimed at analysing prescription and the quality of life in CKD patients to assess how the medication therapy and management practices affect the overall wellbeing of the patients. It was found that the patients had a relatively above average quality of life. However, they required the usage of polypharmacy to treat CKD and the associated comorbidities. Additionally, the duration of hospital stay had a profound effect on the health status of the patients because they had access to complete care throughout the average of 5 - 7 days that they spent in the hospital. CKD is prevalent among all age groups.

## Discussion

1. In this study, an effort was made to examine the current drug regimen in a study population of about 120 CKD patients who met the inclusion and exclusion criteria throughout a 6-month period at the nephrology department at Star Hospitals, Banjara Hills.
2. The study population included patients of both genders between the age group 18-90 years. Considering the increased prevalence of CKD in patients above 18 years, this large age group was selected to signify the dangers of kidney disease that can lead to renal impairment at any stage of life due to the poor quality of living and excessive usage of drugs. The mean age group of the study population was  $57.63 \pm 1.58$  (Mean  $\pm$  SEM). In our study, CKD was found to be more prevalent in the age group 58-67 years.
3. The study indicated that men were more likely than women to develop CKD as evidenced by the fact that, out of 120 patients who participated in the study, 61% (n=73) were males and 39% (n = 47) were females.

## Conclusion

1. Patients with CKD are known to have multiple comorbidities and hence have complex medication regimens. One of the most critical aspects in patients with CKD has been shown to be the utilization of polypharmacy for the management of numerous comorbid conditions. Drug interactions caused by polypharmacy can increase the likelihood of drug failure and lengthen hospital stays.
2. As CKD affects the renal elimination of drugs, it is imperative to adjust the doses for the patients before the therapy begins. The doses should either be reduced or the dosing interval should be prolonged on the basis of the eGFR and creatinine clearance of the patients to avoid toxic effects. CKD and its treatment strategies influence the quality of life (QoL) of dialysis patients. As a result, kidney failure causes several restrictions in patients' cognitive, social, and physical activities.
3. The evaluation of the quality of life in patients with CKD undergoing dialysis will aid the doctors in routinely evaluating their patients' well-being as it is essential to impart better patient care. Formulating individualized treatment regimens can be made easier with the evaluation of the health-related quality of life (HRQoL) and its determinants.

## Informed Consent

Informed consent was obtained from all individual participants included in the study.

## Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the Institutional ethics committee of Star Hospitals, Hyderabad, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

This article does not contain any studies with animals performed by any of the authors. Observational study was conducted on the human subjects.

## Conflict of Interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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