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Disease Distribution and Clinical Outcomes of Inpatients in a Nephrology Ward: A Retrospective Descriptive Study (2016–2025)

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Research Article

Keywords: nephrology inpatient, disease distribution, chronic kidney disease, acute kidney injury, outcome, length of stay

Posted Date: May 21st, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9483301/v1

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Additional Declarations: No competing interests reported.

Abstract

Background: Inpatient profiles and outcomes in the nephrology wards are usually poorly reported but patients utilizing this ward have complex kidney disease and a multitude of comorbidities.

Methods: The study was a retrospective descriptive study based on inpatient ward records which were stored in a local language and translated/standardised to English to facilitate reporting. Frequency counts, percentages, and the simple summary statistics were used to analyse data in Microsoft Excel.

Findings: One thousand two hundred and ninety-two nephrology inpatients were used (20162025). The mean age was 67.0±15.3 years (median 69.5, range 1896). The average distance of stay was 8.0 days (7.7, range 1-65). Chronic kidney disease (52.7%), hypertension (45.3%), and acute kidney injury (43.7%) were the most frequently diagnosed ones, with anaemia (22.8%) and diabetes mellitus (18.9) in the fourth and fifth positions respectively.

1 = Discharged alive

2 = Exitus (in-hospital mortality)

3 = Discharged against medical advice (refused recommended medical treatment)

Conclusion: CKD, AKI and hypertension were the major causes of nephrology inpatient in this cohort with high burden of comorbidity and inconsistent length of stay. Reporting of inpatient disease patterns and outcomes clearly can facilitate service planning, audit and quality improvement.

Introduction

Nephrology wards offer inpatient services to patients with a broad range of renal diseases including acute and chronic kidney diseases often with comorbidities including hypertension, diabetes mellitus, cardiovascular disease, infections, and electrolyte imbalance. The clinical profile of patients admitted nephrology services usually has a complicated nature and needs close observations, specialised research, and multidisciplinary patient management (Shristi et al., 2024). Consequently, the nephrology wards generate a large amount of bed occupancy, length of stay, and the use of healthcare resources.

The distribution of diseases and clinical outcomes among nephrology inpatients is significant to understand how to plan the services and improve the quality of services. Descriptive evidence gathered at the ward level assist in determining the most frequent causes of admission, multimorbidity trends and discharge routes, therefore, informing inpatient staffing, care pathway optimization, and resource allocation (Mottes et al., 2024). Although the clinical and operational significance of the nephrology inpatient care is quite significant, not all institutions have published reports of their inpatient case-mix and outcomes of the routinely collected data.

One convenient way of producing such evidence is through a retrospective descriptive analysis of the hospital records especially in environments where sophisticated analytical platforms not exist (Batte et al., 2025). With routinely recorded inpatient data, it is possible to systematically characterise actual clinical practise without imposing any extra patient or staff load. The given research will outline the demographic features, disease prevalence, and clinical discharge outcomes of inpatients to a nephrology ward in 2016-25, presenting a description of the inpatient nephrology care over a long-term interval.

Methods

Study Design and Setting

This was a retrospective descriptive observational study that was utilised to analyse the distribution and clinical outcomes of the disease among inpatients admitted to a nephrology ward. The descriptive method was chosen to give an in-depth description of the patient features, their diagnosis trends, and discharge outcome based on routinely gathered hospital information without the effort to test hypotheses or make any causal conclusions (Gur et al., 2022). The research has been carried out in a single ward of nephrology related to the practise of inpatient clinical activities in the long term.

Data Source

The information was obtained based on the routinely kept inpatient ward records that were electronically compiled and translated to Microsoft Excel format to facilitate administrative and clinical documentation. The initial data set included name of the variables and categorical values that were provided in the local language. All variables names, diagnostic names and outcome groups were translated into English and standardised before analysis to make sure that they were clear, consistent and is used in international academic reporting. Standardisation and translation were restricted to terminology and labelling, the data values behind this were not changed (Ghimire et al., 2022).

Study Population

The participants in the study were all non-COVID inpatients admitted to the nephrology ward between the year 2016 and 2025 who were in the accessible dataset. There was no sampling or exclusion on the basis of demographic or clinical characteristics and the analysis was based on the entire inpatient case-mix as extracted in normal ward records. The dataset did not identify patients with incomplete core variables and kept all the records fitting the inclusion criteria to be analysed.

Variables and Measures

The data consisted of patient-level variables that are regularly recorded upon admission and discharge. These included age (years), gender (coded) nationality (coded), year of admission and length of stay in the hospital (days). Clinical data were recorded in terms of diagnosis codes, and there was the potential of having multiple diagnoses in the same patient because of the multimorbidity associated with nephrology inpatients. Coded outcome categories were used to record the discharge status, which were various discharge pathways that had been recorded in ordinary practice (Uwumiro et al., 2023). Coded variables were kept and presented in descriptive terms where formal codebooks were not available to not cause confusion between a misclassified variable.

Data Analysis

The analysis of the data was based solely on Microsoft Excel, which is in accordance with study descriptive goals. Patient characteristics, hospitalisation pattern, disease distribution and discharge outcome were summarised with descriptive statistics. The frequency counts and percentages were used to analyse categorical variables whereas the means, median and ranges summarised the continuous variables to capture the central tendency and variability (Shristi et al., 2024). To diagnose data, disease distribution was provided in terms of the proportion of patients allocated every diagnosis code. Due to the possibility of getting several diagnoses registered on individual patients, the patients were permitted to overlap more than one diagnostic category, and the percentages were not limited to add up to 100. Inferential statistical tests and multivariate analyses were not conducted because the research purpose was to describe patterns observed, but not to analyse associations or predictors.

Ethical Considerations

The study protocol was approved by the Institutional Review Board under the protocol number 2025/2501 and conducted in accordance with the Declaration of Helsinki. Due to the retrospective nature of the study, patient consent was not required; however, patient privacy and data security were upheld to the highest standards.

Results

Demographic and Hospitalization Characteristics

They were 1,292 nephrology ward inpatients, who were admitted in 2016–2025. The average age was 67.0 years (SD 15.3), and the median value was 69.5 years. The average days of hospital stay were 8.0 (median 6). The demographic and hospitalisation variables are summarised in Table 1.

Table 1
Demographic and hospitalization characteristics of nephrology inpatients (N = 1,292)

Characteristic	Value
Age, mean ± SD (years)	67.0 ± 15.3
Age, median (range)	69.5 (18–96)
Gender category A, n (%)	698 (54.0)
Gender category B, n (%)	594 (46.0)
Length of stay, mean ± SD (days)	8.0
Length of stay, median (range)	6 (1–65)
Study period	2016–2025

Disease Distribution

There were numerous diagnoses that were commonly documented per patient. Chronic kidney disease (52.7%), hypertension (45.3%), and acute kidney injury (43.7) were the most frequent diagnoses. Table 2 shows the entire distribution of the diagnoses.

Table 2
Distribution of recorded diagnoses among nephrology inpatients

Diagnosis	Patients, n	Percentage (%)
Chronic kidney disease	681	52.7
Hypertension	585	45.3
Acute kidney injury	564	43.7
Anemia	295	22.8
Diabetes mellitus	244	18.9
Fluid & electrolyte disorders	204	15.8
Cardiovascular disease	172	13.3

The patients are diagnosed with over one diagnosis, the percentages are not less than 100.

Discharge Outcomes

Three coded outcomes were used to record the discharge. The majority of patients were in outcome category

1 = Discharged alive

2 = Exitus (in-hospital mortality)

3 = Discharged against medical advice (refused recommended medical treatment)

Table 3
Discharge outcome categories of nephrology inpatients

Discharge outcome category	Patients, n	Percentage (%)
Outcome category 1	1,183	91.6
Outcome category 2	86	6.7
Outcome category 3	23	1.8
Total	**1,292**	**100**

Summary of Results

The inpatients of nephrology were majorly aged individuals with excessive burden of chronic kidney disease, acute kidney injury, and cardiometabolic comorbidities. The length of stay in hospitals was highly dispersed, and the outcomes of the discharges were mostly concentrated in one dominant outcome category.

Discussion

This retrospective descriptive research is the one that gives a broad picture of disease distribution and discharge outcomes of the inpatients to a nephrology ward over a period of nine years (Soret et al., 2025). The results indicate that there is a significant renal disease burden with comorbid conditions with very high frequencies, indicating the intricate clinical patterns that are regularly observed in inpatient nephrology practise. The most commonly recorded diagnoses were chronic kidney disease and acute kidney injury, which were accompanied by hypertension, diabetes mellitus, anaemia, and fluid and electrolyte imbalances (Gur et al., 2022). This trend is in line with the established multimorbidity that defines hospitalised patients with renal disease and highlights the level of care needed in nephrology wards.

The fact that chronic kidney disease is the most frequent type of inpatient admissions implies the long-term need of hospital-based care associated with the development of the disease, acute decompensation, and complications due to renal failure over an extended period. The patients who have progressed or unstable chronic kidney disease often need to undergo a inpatient examination to evaluate the volume overload, electrolyte components, anaemia care, and renal replacement therapies preparation (Pehlivanli et al., 2023). The large percentage of acute kidney injury among this group of patients also gives a clue on the significance of nephrology services in management of acute medical episodes, usually overlapping with chronic illness, which require specialist intervention and close observation.

Presence of the hypertension and diabetes mellitus that is observed often in this study point to their pivotal nature in renal disease epidemiology. These are established risk factors in the development and progression of kidney disease and they are usually prevalent as comorbidities amongst hospitalised nephrology patients (Gigante et al., 2024). Their presence in the inpatient population supports the necessity to implement the integrated management approaches that should address both the renal pathology and the related cardiometabolic issues. On the same note, the significant incidence of anaemia and fluid-electrolyte disorders indicate typical problems of kidney failure and makes the process of inpatient treatment more complicated (Zhang et al., 2023).

The length of stay in the hospital was proved to vary significantly, which means that the severity of the disease, the burden of comorbidity, and the needs of patients are different in the case of patient admission. Although certain admissions can be short-term; to stabilise or provide specific intervention, others need to be admitted to the hospital on a long-term basis owing to clinical instability or unavoidable multidisciplinary management (El-Achkar et al., 2024). This variability has significant impacts on bed utilisation, staffing and resource planning in nephrology services. Length of stay data can useful when hospital administrators and clinicians want to streamline inpatient care paths.

A single dominant category of discharge outcome was a majority of admissions with lesser proportions of patients having alternative outcomes. Even though the categories of discharge outcomes were not semantically classified because of the lack of a formal codebook, they provide a valuable general representation of the inpatient care pathways in the ward (Ghimire et al., 2022). The occurrence of less frequent outcome categories is probably an indicator of more complicated or unfavourable clinical outcomes, which are natural in the practise of inpatient nephrology (Gadalean et al., 2025). The use of code-neutral reporting of outcome distributions is sensible to provide meaningful descriptive information without the likelihood of misclassification or an unsubstantiated assumption.

The paper reveals the value of continuously gathered inpatient data in describing the activity and outcomes at the ward level. Descriptive analyses can provide information of clinical and operational relevance even without sophisticated statistical modelling or other analytical software (Uwumiro et al., 2023). These kinds of analyses are especially useful in cases where research infrastructure is scarce, but a requirement of service evaluation and quality enhancement is necessary. Descriptive studies can help internal audits, resource allocation, and indicate the areas of additional study by the systematic summary of inpatient case-mix and outcomes (Wathanavasin et al., 2025).

Third, it is possible that the research was fraught with limited generalisability to other wards or institutions with varying care settings, for example, their patients, referral patterns, or models of care. Fourth, the analysis is descriptive, which rules out the possibility of drawing causes and evaluating the relationships between patient traits and outcomes. Inferential statistical analyses were not conducted and the results then can be only construed as descriptive outlines and not explanatory conclusions.

Limitations

The findings of this research have a number of limitations that should be taken into account. To begin with, the review was based on retrospective administrative and clinical histories that is prone to poor documentation or coding variability and errors of data entry that are inherent to the routine clinical practise. Another aspect that due to the absence of formal external codebook regarding some variables such as gender and discharge outcomes led to a poor semantic interpretation and required neutral coded information reporting is the lack of formal codebook at their start (El-Achkar et al., 2024). Although this method guaranteed the transparency and the absence of misclassification, it did not allow such variables to be interpreted in greater detail.

Conclusion

This retrospective descriptive study gives an account of the distribution of diseases among patients, the nature of hospitalisation of the inpatients and discharge outcomes of inpatients admitted into a nephrology ward in a long duration. The most common recorded conditions were chronic kidney disease and acute kidney injury, and they were typically accompanied by hypertension, diabetes mellitus, anaemia, and fluid-electrolyte disorders, and this indicates the significant burden of multimorbidity in this patient group. The majority of admissions had an outcome of one overwhelming discharge category, with a lower percentage having more complex clinical pathways.

On the whole, the results indicate that inpatient data routinely gathered can be utilised successfully to describe the activity of the nephrology ward and assist clinicians in conducting audit and service assessment. Structured descriptive analyses, even with no sophisticated analytical software, provide meaningful information about the actual inpatient care and can be used to plan, improve quality and further investigate the area of hospital nephrology service.

Abbreviations

CKD
Chronic Kidney Disease
AKI
Acute Kidney Injury

Declarations

Ethics approval and consent to participate

This study was approved by the **Karabuk University Non-Interventional Clinical Research Ethics Committee (Karabuk, Turkey)** under protocol number 2025/2501.
Due to the retrospective nature of the study and the use of anonymised inpatient data, the requirement for informed consent was waived by the ethics committee in accordance with national regulations.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to institutional data protection policies but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

This research received no external funding.

Authors' contributions

Ö.S. and M.P. contributed to the conception and design of the study.
M.P. performed data collection.
Ö.S. and M.P. conducted data analysis and interpretation.
Ö.S. and M.P. drafted the manuscript and performed literature review.
Ö.S. and M.P. critically revised the manuscript.
All authors read and approved the final manuscript.

Acknowledgements

Not applicable.

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