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PREVALENCE, RISK FACTORS, AND HEALTH CARE IMPLICATIONS OF ACUTE AND CHRONIC KIDNEY DISEASES IN NAGAR GILGIT REGION

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Abstract

Kidney diseases including, acute and chronic conditions are a major public health problem in the global community whereby morbidity and mortality rates are high. Drug use, unhealthy diet, urinary tract infections, and potential genetic predispositions were defined as the most important factors that lead to the prevalence of kidney diseases. To determine the prevalence of the Acute Kidney disease (AKD) and chronic kidney disease (CKD) in Nagar Gilgit area of Pakistan. To find the risk factors involved in the development and progression of AKI and CKD in Gilgit comprising of environmental, lifestyle, and health determinants. The research design used in this study is the mix- methods cross sectional study design, in determining the prevalence, risk factors and health care implication of CKD and AKD in Nagar Gilgit Pakistan. A structured questionnaire was used to collect data on 120 participants who represented all age groups. The analysis of data was conducted to examine environmental health care access factors of the lifestyle. 120 of the patients featured AKD was more prevalent (74.2) compared to CKD (25%). Women predominated nearly twice as many as males with AKD with 61.7% of the cases, 48.3% taking drugs, 76.7% poor diet, and 53.3% urethritis. In 120 respondents, the most important contributing factor was Other health conditions (34.4%), after which there was no specified cause (27.6%), and hypertension (24.2%). Less frequent with under 9% each were obesity, heart disease, and diabetes. Knowledge of the kidney disease burden is essential in the enhancement of the public health care outcome. This paper examined the trends of determinants of AKD and CKD. The most common diagnosis was AKD, with poor diet, drug use, UTIs, and other comorbid conditions being the major factors to the prevalence of the disease. The findings indicate that the region requires an improved knowledge of kidney health, lifestyle modification, and preventive efforts.

INTRODUCTION

ARF is a significant health issue in the world that is known to create a significant level of morbidity and mortality. Sudden impairment of the kidney performance is known as acute kidney injury

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(AKI) that is reversible provided that it is detected in time (1). Acute kidney injury (AKI) is a complex, severe syndrome that can occur as a result of various pathological blows, which is manifested by high levels of serum creatinine(sCr) or decreased urinary output, which have long-term and immediate consequences on patient outcomes (2). The CKD is one of the significant healthcare problems that burden approximately 700 million people around the globe with the condition. (3). CKD is often a consequence of other diseases, for example, diabetes and hypertension, and so individuals with CKD are more likely to have at least one chronic disease comorbidity than other long-term conditions (4). These statistics suggest an increasingly CKD heavy burden in Asia. Still, data about the prevalence of CKD currently across this continent to more meaningfully inform projections into the future have been sparse. At the same time, Asian kidney registries have largely limited systematic data collecting for patients who need kidney replacement therapy due to kidney failure (5). The prevalence of CKD in the Asia-Pacific region ranges from 4.7% to The highest disease burden is seen in China and India (17.4) (6). As a significant source of morbidity and mortality in the contemporary times, CKD has come across large proportions of the global population (7). In addition, the prevalence of CKD is related to a country, age and gender of patients, race or ethnicities, availability of the CKD registry in a country, the time when the study was done, methodology applied to define CKD, such as using biomarker and equation, and the effects of non-glomerular filtration rate (non-GFR) determinants on biomarker levels, the use of ancestry coefficients in approximated glomerular filtration rate (eGFR) equations, etc. Nevertheless, other causes such as environmental toxins (heavy metals, pesticides) and underground water with high levels of fluoride have also been attributed to the high burden of CKD also known as a CKD of unknown origin (CKDu) (8). However, although the amount of epidemiologic data is still abundant, it remains unclear to what extent the negative outcome relationship between CKD and AKI is mediated by the development of the latter condition itself (9). One out of every 3 individuals with diabetes, and 1 out of 5 individuals with high blood pressure in high-income countries will most probably possess chronic kidney disease (CKD) due to the rising rates of diabetes. Thus, it is significant to deal with diabetes and cardiovascular disease since they have already enhanced the risk of developing chronic kidney disease. (10).

Kidney disease, especially the Acute Kidney Injury (AKI) and Chronic Kidney Disease (CKD) is an increasingly popular health issue in Gilgit, Pakistan where the prevalence and risk factors are not well comprehended. Although the rate of kidney diseases among the population in the region continues to increase, limited region-specific information is available regarding the level of the issue. Geographical isolation, restricted access to specialized nephrology care, poor healthcare infrastructure are some of the problems faced in the Gilgit-Baltistan region and they make it impossible to diagnose the disease early and treat it effectively. Moreover, unsafe drinking water, as well as other environmental factors, together with bad diet and uncontrolled use of nephrotoxic medication also increase the risk of kidney diseases. Healthcare facilities are scarce in Gilgit and the patients need to travel long distances in order to get the required healthcare services like dialysis. Another serious concern is the financial burden of kidney disease, particularly in a place where there is a low economic capacity.

METHODOLOGY

Study design

This study followed cross-sectional design as it was a mixed research that focused on the prevalence, factors related to Acute Kidney injury (AKI) and chronic kidney disease (CKD) prevalence and the health care implications of these two diseases in the Nagar District of Gilgit Baltistan, Pakistan. The mixed methods approach integrated both statistical results and qualitative results in order to come up with a more comprehensive picture of the research goals (11). It employed convergent parallel design, which

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implies that qualitative and quantitative data were collected simultaneously and analyzed separately and later followed by a compilation to explain the findings (12).

Study area

The study was conducted in Nagar District of Gilgit Baltistan comprising of central and ruler settlements. The region was chosen because it has limited access to nephrology services and diagnostic tests with a better opportunity to assess the burden of kidney diseases in a marginalized population (13).

Study Population

Quantitative component: It includes persons diagnosed with AKI or CKD, and people with risk factors like hypertension, diabetes, urinary tract infection (UTI) or family history of kidney disease, or who took nephrotoxic drugs in the long run. Qualitative element: Patients, caregivers, health professionals, and district health administrators were involved in the discovery of a wider vision of the problem.

Inclusion criteria

Any person aged any age who was a permanent resident of Nagar District and gave an informed consent in writing.

Exclusion criteria

The people who were living outside Nagar District were eliminated as well as those who could not attend due to severe illness or cognitive impairments.

Sampling Technique and Sample Size

A convenience sampling was applied to hospitals, community health centers, and schools as a total of 120 participants were incorporated. In spite of the fact that random sampling increases generalization, convenience sampling was utilized due to the small resources and the inclusion of people diagnosed with kidney disease and those at risk (14). It was estimated that the sample size had a 95% identified confidence interval and a margin of error of 5% and an expected prevalence rate of kidney disease in rural Pakistani communities of 10% (15).

Qualitative sampling

Participants for interviews were purposively selected from the quantitative group to ensure inclusion of diverse experiences across different demographic and clinical backgrounds (16).

Data collection tools and procedures

Data collection was performed using a structured questionnaire developed from previously validated instruments and adapted to the local context (17,18).

Semi-structured interviews were used to explore participants' lived experiences, healthcare challenges, and social and financial implications related to kidney disease. Interviews were conducted in Urdu Shina, brushiski, ensuring cultural and linguistic clarity (19).

Ethical consideration

The institution gave approval to the study. All participants received the information regarding the purpose, procedure, and confidentiality of the study. Informed consent was obtained in writing and the respondents assured that they would not be penalized in case they withdrew. Data privacy was maintained in compliance with the Decleration of Helsinki (20).

Data analysis

All quantitative data were entered and analyzed using SPSS version 25. Descriptive statistics such as means, frequencies, and percentages summarized demographic and clinical variables. Associations between independent variables and kidney disease status were tested using chi-square and logistic regression analysis (21).

Interview transcripts were manually reviewed and coded thematically following (22). A framework analysis approach (23) was applied to classify recurring themes related to disease awareness, risk factors, healthcare barriers, and socio-economic issues. Triangulation of quantitative and qualitative results enhanced the overall validity and depth of interpretation.

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Results and Discussion

The study investigated the prevalence, in Nagar valley among population in 1200 patients in 3-month duration (May – July) 2025 in DHQ hospital Sikandar Abad Nagar. Out of 1200 patients 120 were suffering with kidney diseases and its shows prevalence. This study determines risk factors, other various factors that contribute to cause the AKD, CKD in 120 patients in Nagar, Gilgit.

Among the 120 participants from Nagar District, Gilgit Baltistan, 74.2%(n=89) were diagnosed with acute kidney diseases(AKD), while 25%(n=30) had a chronic kidney diseases (CKD), and one case (0.8%) was classified as another renal disorder. The higher prevalence of AKD indicates that acute renal impairment is a more common concern in this population, possibly due to environmental exposures, infection, or lack of early medical care.

Table 1: Diagnosis wise Frequency

Diagnosis	Frequency	Percent	Male		Females	
CKD	30	25	16	53%	14	46%
AKD	89	74.2	31	34%	58	65%
Others	1	8	1	100%	0	0

The age distribution revealed that most kidney disease cases occurred in younger individuals aged 21–40 years (39.2%), followed by 1–20 years (31.7%), whereas 41–60 years (25.8%) and 61–80 years (3.3%) comprised smaller proportions. The findings indicate that younger populations are developing renal diseases which is not the situation all over the world since CKD is more prevalent in the older age groups (24,25) than in the younger population. Factors such as contaminated drinking water, poor nutrition, and exposure to unregulated drugs could explain the early onset in this region.

Table 2: Age Wise ratio of patients

Age limits	CKD	AKD	Drug history	Balance diet	UTI history
1_20	6	31	18	10	19
21_40	11	34	20	11	26
41_60	10	17	15	6	12
61_80	1	7	5	1	6

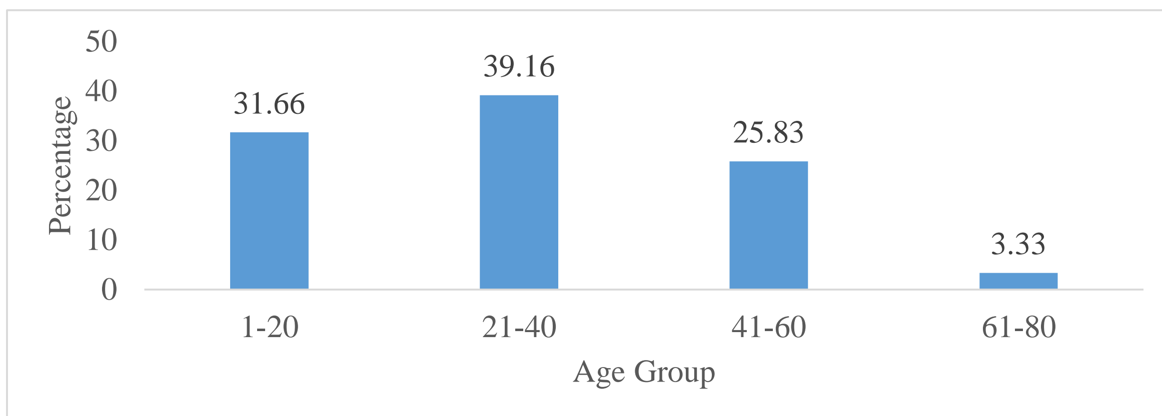

Figure 1: Age Wise prevalence of patients

The figure 4 demonstrate the gender and frequency, percentage there were total 120 participants involved 74 members were females with 61.1 % and 46 males with 38.3%. This study indicates that mostly females are involved.

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Gender distribution showed a female predominance (61.7%), while males comprised 38.3% of the study sample. Among AKD patients, females accounted for 65%, compared to 34% males. Conversely, CKD was slightly more frequent among males (53%) than females (47%). The higher AKD prevalence among women may be attributed to increased susceptibility to urinary tract infections (UTIs) and dehydration, while the slightly greater CKD occurrence in men might be associated with lifestyle factors and hormonal influences. Similar gender disparities have been documented in recent nephrology research (26,27).

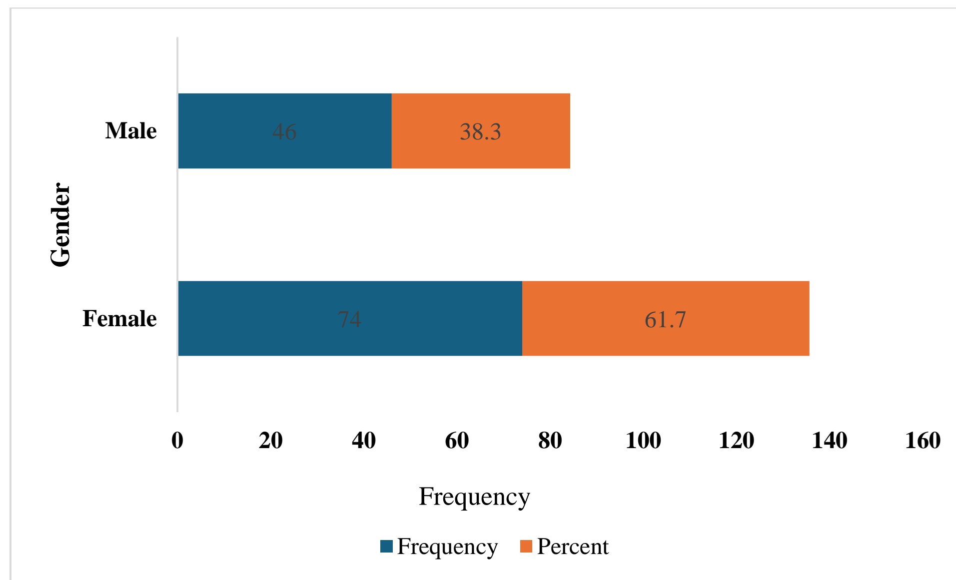

Figure 4: Gender wise frequency

Table 3: Risk Factors and Contributing to Kidney diseases.

	CKD	AKD	Family history	Drug history	Balance diet	UTI history
Male	16	31	23	21	12	20
Female	14	58	21	37	16	44

The given figure 5 depicted that there are several factors contributing to the occurrence of disease among the study participants. The most common reported factor is "other" with 41 cases out of 120 respondents (34.4%). This category includes range of health issues which include e.g. eye sight problem gastric, anemia, jaundice, appendicitis, PCOs, osteoporosis, cancer, allergy, ulcer, gall stone. The second most reported response was "None with 33 cases (27.55%), indicating and unknown reasons. This was followed by hypertension reported by 29 individuals (24.2%). Obesity was identified as contributing factor by 10 respondents (8.3%). Finally, there were 7 cases (5.8%) each of heart disease and diabetes.

The analysis identified multiple risk factors associated with renal impairment. The most frequently reported category was "other health issues" (34.2%), including anemia, gastric problems, and infections. This was followed by hypertension (24.2%), obesity (8.3%), and heart disease or diabetes (5.8%). Additionally, 27.5% of participants reported unknown cause, suggesting the presence of undetected or environmental contributors, such as heavy metal exposure and unsafe groundwater factors recognized as causes of CKD of unknown origin (CKD) in South Asia (28).

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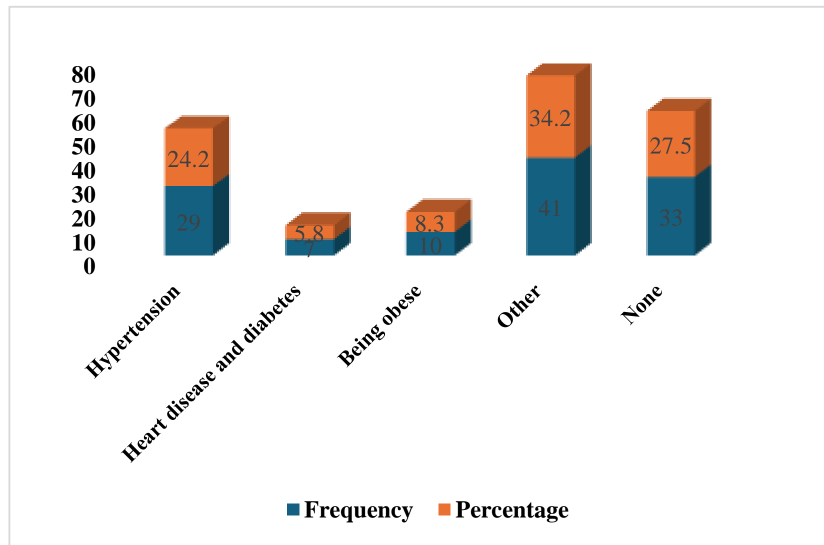

Figure 5: Risk Factors and Contributing to Kidney diseases

A large proportion of participants (72.5%) reported using medications for renal issues, while 48.3% had taken drugs before developing kidney disease. The use of nephrotoxic medications or self-medication practices may contribute significantly to renal impairment, as indicated in recent clinical investigations (29). The given figure 6 illustrated the family history of disease, out of 120 participants 76 cases are No, with no family history and 13.3 % followed by 44 yes cases that their family had case of disease also and percentage is 36.7.

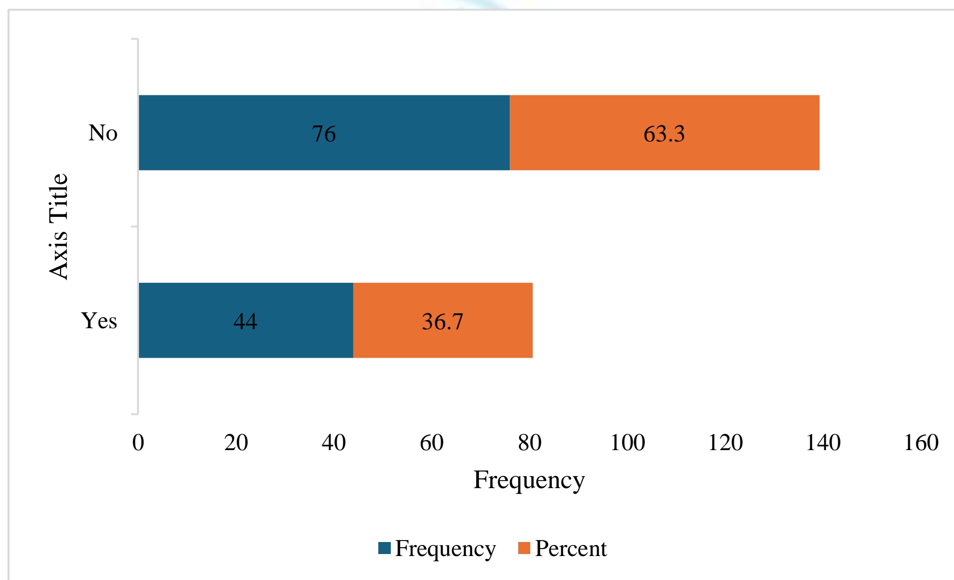

Figure 6: Family history

Family history was present in 36.7% of respondents, indicating possible hereditary tendencies. However, environmental and behavioral factors appeared more dominant. More than half (53.3%) reported a history of UTIs, particularly females, supporting the association between recurrent UTIs and subsequent kidney complications (30).

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Behavioral determinants were also substantial. Most respondents (76.7%) reported not following a balanced diet, 72.2% consumed soft drinks frequently, and 26.7% reported daily fast-food intake Further, 71.7% consumed less than six glasses of water in a day. These poor eating habits may harm metabolic stress, which leads to renal dysfunction (31). Preventive health behavior It was found that preventive health behavior was particularly low 81.7% of the participants only sought medical attention when they were sick, this means that they were not well aware in terms of their health conditions and did not monitor their health on a regular basis.

Distribution of Age and Gender Association with Disease

This was age-specific since analysis showed that AKD was highest in people aged 21-40 years and then 1-20 years. Older adults (41 60 years) had more prevalence in the cases of CKD which indicates that kidney damage, which is acute, in young people, may turn to chronic disease over time. The decreased incidence in the participants who were aged 61-80 years may be attributed to fewer sample representations or decreasing survival at the later stage of the disease. In gender terms, AKD was more common in females whereas CKD was a bit higher in males which enables the already existing research that states that women are more susceptible to acute infections with men being faster progresses of CKD because of hormonal and lifestyle conditions (32,33). These results support the importance of gender-sensitive interventions in prevention and treatment of renal diseases. (34).

Public Health Implications

The results indicate that poor diet, insufficient consumption of water, self-prescription, and poor access to medical services are the primary factors that contribute to renal diseases in Gilgit-Baltistan, which are mainly prevalent among young adults and females. The community screening programs, clean drinking water programs and drug and nutrition awareness are critical in terms of the public health interventions. Access to better healthcare and education of patients can greatly decrease the burden of the disease and avoid AKD developing CKD.

CONCLUSION:

This knowledge on the burden of kidney disease would be crucial in enhancing the outcome of health care among the population. The paper examined the distribution of the determinant of AKD and CKD in the district Nagar, Gilgit. The results show that of every 120 there were 46 males and 74 females who were not spared and most of the females were victims. There were 16 cases of men and 14 cases of women out of 30 CKD cases. This indicates that the CKD is spread quite equally across the sexes and there is not much higher occurrence in men. The most frequently reported diagnosis was acute kidney disease(AKD) with an 89 case. Among them, 31 were men and 58 were women, which is significantly larger percentage. There is a wide gender gap in this sample where women have nearly twice the likelihood of being diagnosed with AKD as men. The above findings demonstrate the necessity of gender sensitive population interventions, especially the focused awareness and early screening of the female population, to minimize the kidney diseases burden in the area. It is suggested that Public Health Education: Conduct kidney health awareness training focusing on risk factors management (diabetes, high blood pressure, unhealthy diet, and use of nephrotoxic medications), early diagnosis, and the acquisition of healthy lifestyles. Improved Access to Healthcare: To reduce the delays in care, create nearby diagnostic and treatment centers, including the basic nephrology. These preventive actions will involve the promotion of balanced foods, the regulation of sale of nephrotoxic drugs, and the consumption of clean drinking water through water purification plants.

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