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RESEARCH ARTICLE OPEN ACCESS

Risk factors for chronic kidney disease among haemodialysis patients in Al-Basrah: A cross-sectional study

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Abstract
Objective: To identify prevalent risk factors and assess associations with demographic characteristics.
Method: A descriptive design is carried out throughout the study period from February to November 2023 to assess the risk factors for chronic renal failure in the haemodialysis unit in Al-Basrah City. A non-probability sample of 166 patients with renal failure is collected from the Al-Basrah Teaching Hospital dialysis ward. The data is analysed using the Statistical Package for Social Sciences (SPSS) version 26. The questionnaire was constructed in two parts: demographic data and the known risk factors of CKD.
Results: The most prevalent risk factors for chronic kidney failure in patients receiving haemodialysis were Diabetic mellitus (27.10%) and Hypertension (25.30%).
Conclusion: The results showed that there is a significant relationship between risk factors of renal failure and educational level, monthly income, and the residents of patients.

Keywords: Risk Factors, Patients, Chronic Kidney disease, Haemodialysis

Plain English Summary

This work examined which health issues or personal characteristics could predispose an individual to develop chronic kidney disease that requires blood filtering treatment (known as haemodialysis). We selected patients undergoing haemodialysis at a medical facility and gathered information regarding their health history, lifestyle, and health conditions. Some of the identified common risk factors were high blood pressure, diabetes, smoking, and that one has a family history of kidney disease. Lots of patients were not aware that the kidney activity was deteriorating until they had reached a severe stage. Additionally, it is critical to recognise that these risk factors may play a role in the development of kidney problems, and getting these symptoms checked in their early stages allows them to be timely managed without having to use dialysis. We have demonstrated that there is still low awareness among people concerning kidney health, and regular check-ups are required, particularly among persons with chronic illnesses.

Background

Chronic kidney disease (CKD) is recognised as one of the most significant public health issues in the world. According to one systematic review and meta-analysis of observational data, the prevalence of chronic kidney disease (CKD) is high worldwide, consistently estimated to be between 11 and 13%, with stage 3 CKD accounting for the bulk of cases (1). Every year, a significant increase in prevalence is anticipated. CKD is one of the

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leading causes of morbidity and mortality. Furthermore, it has been determined that chronic kidney disease (CKD) is a substantial risk factor for the onset of cardiovascular disorders and early death (2).

The most frequent causes of chronic kidney disease (CKD) include glomerulonephritis, interstitial nephritis, pyelonephritis, diabetic nephropathy, polycystic kidney disease, and obstructive nephropathy. Acute kidney damage brought on by infections that go untreated, drugs, toxic chemicals, and heavy metals such as lead, cadmium, mercury, and chromium can also contribute to CKD (3).

In 2010, there were over 2.5 million people receiving renal replacement therapy (RRT); by 2030, that figure was expected to increase to 5.439 million (3.899–7.640). Between 2008 and 2014, the number of patients undergoing RRT increased marginally from 1.77 million to 2.67 million; the number of ESRD patients globally climbed from 2.3 million to 3.37 million in 2014. Widening acceptance criteria, increased general population survival, decreased dialysis patient mortality, and the number of patients undergoing RRT due to some causes, including an increase in the frequency of chronic renal disease and easier access to dialysis therapy in low- and middle-income nations (4).

Patients with CKD had a 13 times greater death rate than people without the disease, especially those in stages 3 and above (3). The World Health Organisation found that CKD was a high-burden illness with an annual death rate of almost 800,000 cases (1.5% of total mortality) in its Global Burden of Diseases 2013 Report (4). Furthermore, the quality of life of patients may be adversely affected by each stage of CKD (5).

According to statistics from the Indonesian Basic Health Survey (Riset Kesehatan Dasar, Riskesdas), there were 3.8 cases of CKD per 1000 people in Indonesia in 2018, nearly two times of 2013. Interestingly, 59% of CKD patients were of productive age. Among inpatients at major hospitals in Indonesia, CKD was among the top 10 diseases that led to hospitalisation and death (6).

The incidence of chronic kidney disease (CKD) is directly correlated with the increase in at-risk persons with diabetes, hypertension, and prediabetes. The leading cause of chronic kidney disease (CKD) and a global health emergency, diabetes affected 425 million people worldwide in 2017 and is expected to affect 629 million by 2045 (7, 8, 9, 10). The second most frequent cause of CKD is hypertension (11, 12). Between 2011 and 2014, the number of individuals in the United States with prediabetes was expected to reach 78.5 million, and approximately one-tenth had been diagnosed with CKD (13). Despite the growing evidence, there is still a startling lack of knowledge of CKD and its key risk factors by both patients and healthcare professionals (14, 15).

Numerous studies have found some risk factors, such as starting factors (diabetes mellitus, hypertension, urolithiasis, urinary tract infections, and medication toxicity) and susceptibility factors (age and family history of chronic kidney disease). Risk factors for CKD have been identified as drinking energy drinks, abusing drugs, and adding chemicals to herbal remedies. Diabetes often leads to diabetic kidney disease (DKD), a chronic consequence. This accounts for 50% of instances of end-stage kidney disease (ESKD) and chronic kidney disease (CKD) (11, 15, 16).

In the dialysis unit, the nurse is essential for patient monitoring, assistance, assessment, and education. Due to the numerous possible complications that can arise during dialysis, including clotting of the dialyser or dialysis tubes, air blockage, insufficient or excessive fluid removal, low blood pressure, cramping, vomiting, blood leakage, contamination, and issues with access tubes, both the patient and the dialyser need to be continuously monitored. (9). This aimed to identify prevalent risk factors and assess associations with demographic characteristics.

Materials and Methods

Research design

A cross-sectional descriptive study design is carried out throughout the study period from February to November 2023 to assess the risk factors of renal failure in the haemodialysis unit in Al-Basrah City.

Setting and samples

The setting of the study includes Al-Basrah Teaching Hospital, a dialysis ward. A purposive (because this study is a cross-sectional study, therefore the researcher uses this type of sampling) sample of 166 patients out of all the patients with chronic renal failure was collected from the dialysis unit, excluding emergency dialysis.

Measurement and data collection

The questionnaire was divided into two sections: demographic information and the recognised risk factors for chronic kidney disease. Ten factors make up the second section, while the first seven parts focus on the patients' social and demographic traits and how they relate to renal failure. To

determine the questionnaire's appropriateness and clarity regarding the objectives of the current study, a panel of experts was engaged to evaluate its content validity. Cronbach's Alpha correlation coefficient (r=0.87) is used to evaluate the questionnaire's reliability. According to the results of the pilot study, the instrument is sufficiently reliable for the current investigation.

Data analysis

The data were collected by applying a constructed questionnaire format and interview techniques as means of data collection. The study's data were analysed using version 26 of the Statistical Package of Social Sciences (SPSS).

Results

Table 1: Patients' Demographic Data

Data	Groups	F	Percent
Age	10-19	1	0.60%
	20-29	16	9.63%
	30- 39	20	12.04%
	40-49	33	19.87%
	50-59	46	27.71%
	60-69	33	19.87%
	70-79	13	7.83%
	80+	4	2.40%
Gender	Male	86	51.80%
	Female	80	48.20%
Occupational	Not employed	78	46.98%
	Earner	41	24.69%
	Retired	18	10.84%
	Employee	29	17.46%
Educational Level	unlettered	73	43.97%
	Read and write	42	25.30%
	Primary	22	13.25%
	Secondary	14	8.43%
	Diploma	9	5.42%
	Bachelor's	6	3.61%
	Married	112	67.46%
Marital status	Non-married	22	13.25%
	Divorce	3	1.80%
	Widow	29	17.46%
Monthly income	Poor	107	64.45%
	Moderate	45	27.10%
	Good	14	8.43%
Resident	Urban	69	41.56%
	Rural	97	58.43%

F = Frequency

The study's findings indicate that the largest proportion of participants (27.71%) were aged 50–59 years. Male respondents made up the majority (51.80%), unlettered (43.97%), and married (67.46 %). Regarding the monthly income, participants were classified as poor (64.45 %), and most of them resided in a rural area (58.43 %).

Table 2: Risk factors

Risk Factors	F	%
Diabetic mellitus	45	27.1
Hypertension	42	25.3
UTI	21	12.65
Medication	19	11.44

Kidney stone	18	10.84
Kidney cysts	9	5.42
Kidney atrophy	5	3.04
Cardiovascular disease	4	2.4
Systemic Lupus Erythematosus	2	1.2
Enlarged prostate glands	1	0.6

F = Frequency, % = Percent

The table shows that the most common risk factors for CKD are Diabetic mellitus (27.10 %) and Hypertension (25.30 %).

Table 3: Association between risk factors for CKD and sociodemographic variables of the patients

Socio-demographic Characteristics	Category	Risk factors	Significant
Age	10-19	1	X2 (3.495) p-value (0.900) N. S
	20-29	16	
	30- 39	20	
	40-49	33	
	50-59	46	
	60-69	33	
	70-79	13	
	< 80	14	
Gender	Male	86	X2 (34.112) p-value (0.950) N. S
	Female	80	
Occupational	Doesn't work	78	X2 (36.105) p-value (0.700) N. S
	Earner	41	
	Retired	18	
	Employee	29	
Level of Education	Illiterate	73	X2 (44.102) p-value (0.000) S
	Read and write	42	
	Primary	22	
	Secondary	14	
	Diploma	9	
	Bachelor's	6	
Monthly income	Poor	107	X2 (4.012) p-value (0.000) S
	Moderate	45	
	Good	14	
Marital status	Married	112	X2 (34.002) p-value (0.800) N.S.
	Non married	22	
	Divorce	3	
	Widow	29	
Resident	Urban	69	X2 (3.110) p-value (0.000) S
	Rural	97	

X^2 = Chi-square, S = Significant, N.S = non-Significant

When a p-value is equal to 0.05, the preceding table demonstrates that there is no correlation between the patients' ages, genders, occupations, and marital status and the risk factors for renal failure. Also, when a p-value is equal to 0.05, there is a significant correlation between the patients' level of education and their monthly income, place of residence, and risk factors.

Discussion

This study aimed to identify the most prevalent risk factors for chronic kidney disease (CKD) and examine their association with demographic characteristics. The findings revealed that diabetes mellitus and hypertension were the leading risk factors—results that are consistent with multiple prior studies (10, 11, 12), which similarly identified these conditions as the most common contributors to CKD.

The study included 166 participants, the majority (27.7%) of whom were between 50 and 59 years of age. More than half of the participants were male (51.8%). These findings align with those of other studies reporting a predominance of male patients undergoing dialysis (13, 14, 15), and a high proportion of patients with low levels of formal education, particularly among the illiterate population (16).

The findings of this study are consistent with previous research, confirming that diabetes mellitus is a leading risk factor for chronic kidney disease (CKD) (17). These results align with those from a case-control study conducted in a district hospital in Indonesia in 2019 (4), which similarly identified diabetes and hypertension as significant contributors to CKD development.

This study found statistically significant evidence supporting the association between both diabetes and hypertension and an increased risk of chronic renal disease. However, no significant relationship was found between these risk factors and demographic variables such as gender, age, or marital status. This suggests that gender may not directly influence kidney damage; instead, the observed associations in different populations may be due to behavioural, hormonal, or healthcare access differences.

In contrast, significant associations were observed between CKD risk factors and other socio-demographic variables, including level of education, place of residence, occupation, and monthly income. These findings underscore the role of social determinants in shaping health outcomes and highlight the need for context-specific public health interventions.

Preventing the onset of chronic kidney disease requires prioritising the control of diabetes and hypertension as critical public health objectives. Population-wide health promotion initiatives focusing on healthy diet, physical activity, and lifestyle modification should be scaled up to reduce the prevalence of these conditions.

Regular screening for blood glucose levels and blood pressure, particularly among high-risk groups—such as older adults and individuals with obesity—should be institutionalised within primary healthcare services. Moreover, these findings support the implementation of targeted education and screening programs for diabetes and hypertension, especially in rural and low-income communities, where access to healthcare and health literacy may be limited.

Study limitations

This study was subject to several limitations. The use of a purposive (non-probability) sampling method may have introduced selection bias and limited the generalizability of findings. The single-centre design also restricts the applicability of results to broader populations. Additionally, reliance on self-reported data may have introduced response bias and affected the accuracy of the findings.

Conclusion

This study identified diabetes mellitus and hypertension as the two leading causes of chronic kidney disease (CKD) among patients receiving haemodialysis. CKD, in addition to impairing renal function, contributes to a heightened risk of cardiovascular disease and represents a growing global public health challenge. The demographic profile of the study population revealed that most patients were male, older adults, illiterate, unmarried, unemployed, with low monthly income, and residing in rural areas. These findings underscore the need for population-level interventions—particularly in vulnerable groups—focused on lifestyle modification, including healthy diet, regular physical activity, and prevention of modifiable risk factors such as hypertension and diabetes.

List of Abbreviations

CKD: Chronic Kidney Disease
ESKD: End-Stage Kidney Disease
ESRD: End-Stage Renal Disease
NS: Non-significant
RRT: Renal Replacement Therapy
S: Significant
SPSS: Statistical Package for the Social Sciences
UTI: Urinary Tract Infection

Declaration

Ethical approval and consent to participate

Ethical approval for this study was obtained from the Research Ethics Committee of the College of Nursing, University of Basrah (Approval Number: 3/8/198; dated February 5, 2023).

Consent for Publication

Availability of Data
The data and materials associated with this research will be made available by the corresponding author upon reasonable request.

Conflicts of Interest
The authors declare that they have no competing interests.

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Authors' contributions
FRK: Conceptualisation, Experimental Design, Data Collection, Laboratory Analysis, Statistical Analysis, Interpretation of Results, Drafting and Writing the Manuscript. AHL: Supervision, Guidance on Methodology, Critical Review and Editing of the Manuscript, Final Approval of the Version to Be Published. Both authors have read and approved the final manuscript.

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