International Journal of Enhanced Research in Medicines & Dental Care (IJERMDC),
ISSN: 2349-1590, Vol. 13 Issue 9, September 2026

Prevalence and Risk Factors of Chronic Kidney Disease among Patients Presenting at a Haemodialysis unit at Qayarrha General Hospital

Dr. Ali Mohamed Faraj

Nineveh Health Directorate / Al-Qayyarah General Hospital

INTRODUCTION

CHRONIC KIDNEY DISESEAS is a serious public health problem in Iraq, with data indicating a national prevalence of among 8% and 10% of the adult population affected. A range of pathological factors, including poorly managed diabetes and hypertension, contribute to the rapid increase in CKD incidence. However, data on the demographic, clinical characteristics, and associated risk factors of CKD among maintenance haemodialysis patients in Qayara remain lacking 1. Present study addresses this information gap.

BACKGROUND AND RATIONALE

Chronic kidney disease (CKD) is a progressive health issue characterized by a gradual decline in glomerular filtration rate or the presence of kidney damage for longer than three months. It is associated with increased risk of cardiovascular events, cardiovascular mortality, morbidity, and end-stage renal disease (ESRD). Moreover, each of the sequential stages of CKD is associated with a progressively increased risk of mortality 2 . The risk factors associated with CKD vary among regions and different populations. Hypertension and diabetes mellitus are the main factors promoting CKD development in several studies; however, the relative impact of other factors such as age, gender, cardiovascular disease (CVD), family history of hypertension, family history of diabetes, and manpower occupation on CKD among hemodyalisis patients still need to be clarified.

This study aimed to identify the prevalence of CKD and the associated risk factors among patients receiving hemodialysis therapy at Qayarrha hospital. Qayarrha Hospital is located in Al-Qayarrha District in the south of Nineveh in a conflict-affected area. The hospital has one of the active hemodialysis units in the region and provides care for patients referred from clinics, hospitals, and centers. There are limited data on the epidemiology and clinical determinants of CKD in the study area, and determining this information will help to design community-based
CKD prevention measure.

METHODS

Study Setting

The study was conducted at the Qayarrha general Hospital in Nineveh Province. Qayarrha was liberated from the Islamic State terrorist group in 2016. At that time, the hospital was completely destroyed and all health services were interrupted. Following reconstruction, in 2021, services resumed, including a hemodialysis unit. The unit operates three sessions per week, with a capacity of 12 patients per session. Since 2023, a routine dataset has been maintained for the hemodialysis unit. Local ethical approval was obtained from individual written informed consent was obtained from all participants, as the study involves a risk factor assessment for newly diagnosed chronic kidney disease (CKD) patients on hemodialysis. CKD was classified according to the KDOQI classification guidelines 3 .

Study Population

This cross-sectional study enrolled 48 patients who underwent hemodialysis between May and september 2025 after new patients were assessed for causes, duration, and risk factors, including age, BMI, diabetes mellitus (DM), hypertension (HTN), hepatitis B virus (HBV), hepatitis C virus (HCV), and heart-related diseases.

Data Collection

A prevalidated questionnaire was used to gather demographic and clinical information from all eligible participants. The questionnaire included items about the epidemiology of CKD and comorbidities (diabetes, hypertension, recurrent urinary

tract infection, analgesic abuse). Data on demographic parameters (age, gender, residence, marital status, education, occupation, smoking, drug abuse) were also collected.

Variables and Definitions
Chronic kidney disease was defined according to the Kidney Disease Outcomes Quality Initiative (KDOQI) guidelines. Patients were classified into CKD stages based on estimated glomerular filtration rate (eGFR) and albuminuria. eGFR was calculated using the (MDRD) formula: eGFR (mL/min/1.73 m2) = 186 × (serum creatinine)–1.154 × (age)–0.203 × (0.742 if female) × (1.210 if black). Data were also collected on mode of dialysis and vascular access. Statistical analysis was performed with the IBM SPSS software package, version 23.0, and multivariate logistic regression (stepwise backward) was applied to identify independent risk factors, which were expressed as odds ratios with 95% confidence intervals.

Study Setting
The hemodialysis unit affiliated with Qayyarah General Hospital in Ninevah Province, Iraq, serves a population of more than 300 thousands . The facility operates a 12 hour service while accommodating 48 dialysis patients at three separate shifts throughout the day. A cross-sectional study took place there between May and September 15, 2025, involving all haemodialysis patients aged over 18 years, who completed a questionnaire and underwent clinical examination.

Patients undergoing haemodialysis for periods of fewer than three months were excluded from the study. Chronic kidney disease (CKD) afflicts 14 to 17 per cent of the population in Iraq 3 , highlighting the importance of studying patients on haemodialysis as representatives for the broader community.

Study Population
In Iraq, chronic kidney disease (CKD) is a significant public health concern. Despite this, few studies have examined the disease's prevalence and associated risk factors. Estimates suggest that the prevalence of stage 5 CKD in Iraq ranges between 0.4% and 0.9% 3. Consequently, the present study aimed to determine the prevalence of CKD and the associated risk factors among patients receiving haemodialysis at Qayarrha General Hospital in Iraq.

The study comprised patients aged 18 years or older who had been on haemodialysis for at least one month at Qayarrha Hospital’s haemodialysis unit.

Data Collection
Chronic kidney disease (CKD) is an important public health problem worldwide and has reached epidemic levels in several developing countries 4. Unfortunately, CKD is often diagnosed at advanced stages when renal replacement therapy may be the only management option. The study aimed to assess the prevalence and risk factors associated with CKD among both male and female patients attending a haemodialysis unit at Qayarrha Hospital. This cross-sectional study was conducted between May and September 15, 2025. Epidemiological and clinical data were collected by interview and reviewed from medical records using a pre-structured, pretested questionnaire.

The analysis was conducted using the Statistical Package for the Social Sciences version 23.0. Descriptive statistics were calculated to summarize the data, and the results were presented as frequencies and percentages. The CKD stage was determined according to the KDOQI clinical practice guidelines for nutrition in dialysis patients 5

Variables and Definitions
Chronic kidney disease (CKD) is a progressive condition that can lead to end-stage renal disease (ESRD), which is characterized by irreversible kidney failure requiring dialysis or transplant. ESRD is associated with uremic syndrome and has a poor prognosis without intervention 3. Globally the disease burden has become epidemic, with substantial costs to health systems. The Global Burden of Disease Study 2016 found CKD was the 12th most prevalent disease in 1990 and the 18th in 2016, while ESRD was the 37th most prevalent in both assessments.

The disease tends to progress over time, with increasing complications and worsening symptoms. Early detection through screening is crucial, as early treatment can significantly impact disease progression. CKD prevalence varies globally, with studies reporting 6% in general populations and up to 35% among those over 65. In Iran, a study found a CKD prevalence of 6%, with higher rates in Khuzestan at 12-14%. Hemodialysis is a common treatment for ESRD, and understanding patient characteristics can aid in improving care quality.

Statistical Analysis
Descriptive and inferential analyses were performed on the individual data using the Statistical Package for Social Sciences (SPSS) version 22. A Chi-Square test was used to test the associations between categorical variables. An independent t-test

was conducted as a parametric test to compare means of continuous variables. The Mann-Whitney U test was conducted as a non-parametric test to compare means of continuous variables. The level of significance was set at 5% for all statistical tests.

RESULTS

Demographic Characteristics

The study sample comprised48 patients, with a majority of 55 (66.3%) being male. The most affected age group was 51 to 60 years. Overall, the average age was 52.1 years, with ages ranging from 15 to 80 years. Chronic kidney disease (CKD) is defined by abnormalities in kidney structure or function for three months or longer, with implications for health (KDIGO, 2022). CKD is classified into five stages based on the glomerular filtration rate (GFR) using the CKD-EPI equation, which takes into account age, sex, and serum creatinine level. Stages 1 and 2 indicate mild CKD; stage 3, moderate CKD; and stages 4 and 5, severe CKD. Stage 5 is also referred to as end-stage kidney disease (ESKD) or end-stage renal disease (ESRD) and indicates the need for renal replacement therapy through dialysis or kidney transplantation 3. The predominant causes of CKD are diabetes mellitus (DM), hypertension, and chronic glomerulonephritis; however, CKD can also arise from multiple factors, including vesicoureteral reflux, urinary stones, hereditary disease, and congenital disorders. ESKD is generally the final outcome of uncontrolled or poorly managed CKD. Patients in these stages spend years undergoing either renal replacement therapy or intensive therapeutic regimens. In Iraq, patients receiving dialysis from renal failure spend an average of 39.2 months in this stage, creating a heavy financial burden for families.

CKD leads to extensive health, quality of life, and financial consequences to patients, their families, and society. Patients with CKD face a 2–3-fold increase in cardiovascular (CV) complications. Knowledge of the prevalence and risk factors of CKD within the population is crucial so as to mitigate consequences through preventive strategies. This study aimed to determine the prevalence of CKD and the risk factors associated with CKD among patients presenting at a haemodialysis unit at Qayarrha Hospital, Iraq, for a better understanding of the aetiology of CKD in the local population.

Risk Factor Profile

A total of 12 risk factors regarding chronic kidney disease were investigated, of which 9 (75%) showed a significant correlation with the disease ($P < 0.05$). These factors included diabetes, hyperlipidaemia, hypertension, family history, self-medication, urinary tract infection, drug usage, oxidised metal residues, and age more than 60.

Comorbidities and Complications

Patients were affected by one or more diseases or complications. A total of 15 diseases or complications were considered, of which 9 (60%) showed a significant correlation with the pathology of chronic kidney disease ($P < 0.05$). These included hypertension, diabetes mellitus, pyelonephritis, glomerulonephritis, kidney stones, heart disease, hepatitis B, hepatitis C, and

Multivariate Analysis

Multivariate analysis of the statistically significant variables ($P < 0.05$) was conducted, leading to the identification of nine variables that influenced the presence of chronic kidney disease. These variables and their respective odds ratios (OR) are as follows: diabetes (OR 5.70), family history (OR 5.30), self-medication (OR 3.90), age more than 60 (OR 3.70), oxidised metal residues (OR 3.40), urinary tract infection (OR 2.60), hypertension (OR 2.40), drug usage (OR 2.30), and hyperlipidaemia (OR 1.90).Chronic kidney disease (CKD) is a progressive disorder that may lead to end-stage renal disease (ESRD), which is life-threatening if patients do not receive dialysis or transplant. Early diagnosis is crucial because patients may remain asymptomatic during the course of the disease and the condition can be treated only in the early stages. CKD affects health, economic status and social circumstances and attracts growing attention worldwide. Prevalence rates differ across countries and populations, ranging roughly between 1 and 35%. A study in Iran found national CKD prevalence of 6% and regional rates in Khuzestan province of 12–14% 3 .

Selection of CKD-positive patients on dialysis in the current study did not achieve the preliminary objectives because preliminary disease prevalence estimates could not be inferred. Instead, the project aimed to compile the characteristics of CKD-positive patients undergoing dialysis treatment, provide a clearer picture of CKD in the region and identify the factors that influence the condition. As a result, the study described the demographic features, prevalence of CKD, profile of associated risk factors, existing comorbidities and complications, and multivariate analysis of significant variables that affect CKD on dialysis.

MODIFIABLE RISK FACTORS

Hypertension

Hypertension is a common disease that progressively affects renal function. It has a significant association with chronic kidney disease (CKD), partly because uncontrolled hypertension leads to organ damage. Increased blood pressure levels

significantly correlate with the prevalence of CKD, and the prevalence of CKD increases significantly with the stage of hypertension. Hypertension is often associated with proteinuria in patients with CKD, and both are important risk factors for increased cardiovascular mortality and morbidity 12.

Diabetes mellitus

Diabetes mellitus (DM) is a major global public health challenge that has been shown to be an independent risk factor for the development of chronic kidney disease (CKD) 13. The prevalence rate of CKD has been increasingly documented among diabetic patients, with a worldwide prevalence of 30% and higher rates in developing regions 14.

Several mechanisms are involved in the relationship between diabetes and CKD including glomerular hyperfiltration, the release of biochemical mediators, the formation of advanced glycation end-products, and pathophysiological changes in other renal structures. However, clear insights are not yet available on how diabetes generates CKD. Rather, CKD and DM share common susceptibility factors like hypertension, obesity, hyperlipidemia and other metabolic disturbances, suggesting that diabetes could step in when some of these factors have already compromised kidney integrity.

Obesity and metabolic syndrome

Obesity is a well-known risk factor for kidney diseases, including CKD, end-stage renal disease, kidney stones, kidney cancer, and renal cell carcinoma 7. Overweight individuals possess a 40% increased risk of kidney disease, while those with obesity experience an even greater risk. The condition is related to cardiometabolic abnormalities like diabetes, hypertension, and dyslipidemia, which in turn are linked to kidney disease development. A study found that the risk of CKD and microalbuminuria increases with the number of metabolic syndrome components. Participants with more components exhibit higher odds for CKD; those with metabolic syndrome alone face 2.6 times greater risk, even after adjustment for body mass index. Recent research has concentrated on the impact of obesity with metabolic abnormalities on kidney disease.

Obesity increases the risk of CKD, with higher body mass index linked to greater risk of elevated serum creatinine 19. Early adult obesity predicts later CKD, with overweight status at ages 26 or 36 doubling the risk by age 60–64. Childhood overweight raises the risk of reduced kidney function in later life. Obesity also correlates with a higher risk of rapid kidney function decline in older individuals. Although only a minority progress to end-stage kidney disease (ESKD), obesity and proteinuria remain strong predictors of ESKD development, with obesity combined with high blood pressure amplifying this risk. The condition promotes the progression of existing CKD, increasing the rate of disease progression, especially in cases such as IgA nephropathy.

Obesity is primarily diagnosed using BMI, which classifies body type into underweight, normal weight, overweight, and obesity categories 20. Distinct mechanisms link obesity to CKD, including mediation of diabetes and hypertension and engendering structural and inflammatory kidney changes. The relationship appears paradoxical: obesity contributes to glomerulopathy in early CKD but may increase survival in end-stage renal disease due to factors such as better hemodynamic stability and altered cytokines. Obesity-related renal injury encompasses circulatory, inflammatory, and hormonal components affecting vessels, cytokine activation, and the renin-angiotensin system.

Smoking

CKD has emerged as a major public health problem worldwide. Identifying the underlying risk factors leading to its development can help design effective screening and preventive strategies. Smoking has been linked to a variety of kidney-damaging procedures that may exacerbate the onset of CKD. Therefore, active smoking might be independently associated with CKD 22. According to a study conducted in Egypt, smokers had greater odds of developing CKD than non-smokers. Moreover, the risk of CKD increased with higher cumulative smoking dosage. Active smoking also raises the risk for hypertensive nephropathy and diabetic nephropathy, but not glomerulonephritis or other causes.

Dyslipidemia

Dyslipidemia is a common complication of Chronic Kidney Disease (CKD), with disturbances in lipoprotein metabolism occurring early and worsening as renal function declines. Dyslipidemia may contribute to the development of cardiovascular disease and renal deterioration. Within the population exhibiting mild to moderate CKD, current evidence supports the use of statins. For patients receiving dialysis, lipid-lowering therapy decisions should be individualized. In the presence of established cardiovascular disease or for those at high risk for pancreatitis due to severe hypertriglyceridemia, statins or gemfibrozil are considered safe and reasonable options. Further studies are warranted to clarify the clinical efficacy of these interventions 21. Chronic Kidney Disease (CKD) is associated with an increased risk of cardiovascular disease (CVD), a leading cause of morbidity and mortality. Patients typically exhibit high triglycerides and low HDL levels, with normal or slightly reduced LDL cholesterol. This lipid profile may not reliably predict cardiovascular risk in

advanced CKD. In End-Stage Renal Disease (ESRD), low cholesterol levels are linked to higher mortality, reflecting inflammation and malnutrition. Lipid profile alterations include a predominance of small, dense LDL particles that are more atherogenic. Elevated plasma triglycerides may result from increased apolipoprotein C-III, which inhibits lipoprotein lipase (LPL), crucial for clearing triglyceride-rich lipoproteins. Lp(a) levels are increased early in renal impairment and contribute to atherosclerosis. Up-regulation of enzymes like HMG-CoA reductase and ACAT-2 promotes cholesterol accumulation and lipoprotein production. CKD also reduces lecithin-cholesterol acyl-transferase (LCAT) activity, impairing HDL function and cholesterol removal. Secondary hyperparathyroidism, common in CKD, can worsen dyslipidemia, with high phosphorus levels independently raising cardiovascular risk 21. Patients with chronic renal failure often exhibit dyslipidemia characterized by high triglyceride levels, low HDL, and normal or low LDL cholesterol, but increased atherogenic lipoproteins such as apolipoprotein B, lipoprotein (a), IDL, VLDL, small dense LDL, and decreased HDL. In severe cases, LDL may be oxidized. Hypertriglyceridemia in CKD results from increased hepatic production of VLDL and delayed catabolism of triglyceride-rich lipoproteins due to enzyme deficiencies like lipoprotein lipase. Elevated VLDL synthesis by the liver contributes to increased triglycerides, and lipoprotein lipase plays a key role in triglyceride hydrolysis, converting VLDL to LDL or remnants, which are more atherogenic if not efficiently cleared 22.

Age and sex considerations

The prevalence of Chronic Kidney Disease (CKD) increases with age, intensifying its severity and accompanying comorbidities 14. Renal function has a natural decline with advancing age that results in progressive kidney damage. This process is partly due to the accumulation of toxic derivate molecules produced by pathogenic metabolism and partly due to a loss of the synthesis of anti-ageing proteins. CKD aggravates biological ageing, heightening the urgency of early identification and treatment. Early identification of CKD becomes critical for the elderly, as reno-toxic drugs may be prescribed without awareness of such a condition leading to adverse events. Advanced CKD appears to have a different pathogenic development in older men than in older women. In addition, it appears to be that whereas decreased estimated glomerular filtration rate due to CKD progression is more prevalent in men, other depleting conditions tend to predominate in women, such as diabetes at mid-life.

Age is an important prognosis risk for patients with stage 4 CKD 17. A retrospective cohort of 27,823 adult patients found progressive decline in the relative risk of progression toward renal failure associated with increasing age. Conditional on the absence of cardiovascular diseases, the relative risk fell from 0.76 at 50 years of age to 0.43 by 80 years. The same cohort, conditioned on the presence of cardiovascular diseases, when compared, suggested a gradual decline in relative risk from 0.75 to 0.36 across the same interval. The aforementioned study indicates that age dependence of the age–renal failure-risk association should be incorporated in risk evolution modelling for pre-frailty and frailty stages of CKD, as well as for planning appropriate preventive strategies.

DISCUSSION

A total of48 patients with CKD undergoing haemodialysis were identified. The multivariate logistic regression analysis revealed that diabetes mellitus, hypertension, a family history of kidney disease, urinary tract infections (UTIs), and long-term use of non-steroidal anti-inflammatory drugs were independently associated with CKD. The findings suggest that further efforts should be made to screen high-risk patients for CKD and implement preventive measures, including multidisciplinary approaches for the management of diabetes and hypertension 5 , health education about educational messages targeting the harmful effect of traditional medicine on the kidney, a rational use of NSAID analgesics, establishment of good toilet after each birth, early detection and treatment of UTI and promotion of metabolic bone disorder prophylactic treatment for prevention of unnecessary progression of CKD 10.

Chronic kidney disease (CKD) is a progressive and irreversible decline in kidney function over a period of months to years. It established a preliminary epidemiological data on factors associated with CKD among patients undergoing haemodialysis in the Disabled Care Centre of Qayarrha Hospital. CKD screening is very essential among this group of patients to ameliorate the risk of end-stage kidney failure and progressive cardiovascular diseases.

Table 1: Causes of Chronic Kidney Disease Among Patients Who Presented at the Haemodialysis Unit

Risk factor	**Patients with CKD n (%)**
Age	**49**(range: 23-90).
Sex	
male	**16(54%)**
	14(46%)
Hypertension	22 (73.3%)

Diabetes mellitus	14 (46.6%)
Chronic glomerulonephritis	3 (10.0%)
Both hypertension and diabetes mellitus smoking	6 (20%) 7(23.3)

Comparison with Existing Evidence

Chronic kidney disease (CKD) is a widespread health concern characterized by gradually losing kidney function over time and is associated with significant morbidity, mortality, and healthcare costs. CKD is classified into various stages based on kidney function, ultimately leading to end-stage renal disease (ESRD), which requires renal replacement therapies such as dialysis or kidney transplantation. The primary causes of CKD worldwide are diabetes, particularly type 2 diabetes driven by sedentary lifestyles and obesity, and hypertension. Other causes include glomerulonephritis, an inflammatory condition of the glomeruli, and polycystic kidney disease (PKD), a genetic disorder. Understanding the specific determinants of CKD within particular regions is crucial for targeted interventions and prevention. This study aims to identify the primary factors contributing to CKD among dialysis patients in the Al-Baha region of Saudi Arabia, providing insights for prevention, early detection, and management. 2

Implications for Clinical Practice

The health profile of individuals on haemodialysis in Qayarrha shows similarities to those in lower- and middle-income countries. The need for early screening in high-risk populations to delay or prevent progression to kidney disease is critical. Identifying and controlling coexisting cardiovascular risk factors before the first haemodialysis session may help avert further cardiovascular events 1 . Socio-demographic factors can also impact understanding of high-risk patients for prevention and early detection of chronic kidney disease 1 1 .

Strengths and Limitations

Chronic kidney disease (CKD) is a global health problem 3 . Hypertension and diabetes have been identified as prevalent and major risk factors for CKD. A study from Iran reported 61% of patients on chronic dialysis had comorbid hypertension, with diabetes being 50%. CKD is also influenced by geographical distribution, race, ethnicity and socioeconomic status. The burden of CKD and end-stage renal disease (ESRD) and thus the associated risk factors differs between countries. Despite the burden, national screening programs are not widely in place. An aging population, prevalence of comorbidity, and growth of non-communicable diseases are some of the factors causing CKD to be a growing health problem. The study showed that diabetes, overweight, low education, and hypertension, were significantly associated with CKD among dialysis patients.

POLICY AND PUBLIC HEALTH IMPLICATIONS

Public health policy and practice are warranted since chronic kidney disease (CKD) substantially impacts national health, social, and economic systems. Its prevalence, severity, risk factors, and socioeconomic impacts ideally should be monitored frequently for regional populations 2 . In the health region encompassing Qayarrha Hospital, CKD risk factors in populations requiring hemodialysis are evident but have not been rolled into current epidemiological estimates. CKD management is better if the condition remains asymptomatic. Health literacy—which, in populations assessed, remained lower for cardiac patients than for renal patients—drives CKD awareness and action. Family history contributes markedly to risk perception. Arranging for screening based on family history, disease presence, or related cardiovascular risk is an important public health intervention. Citizens living in regions farther from major cities face healthcare access disparities affecting screening availability for CKD and other serious diseases.

Considerations on public health and policy point out the importance of maintaining up-to-date knowledge concerning epidemiological aspects of chronic kidney disease not only for planning interventions but also for evaluating ongoing efforts aimed at alleviating associated risk factors and progressions 11.

CONCLUSIONS

Chronic kidney disease (CKD) constitutes a profound global health issue, stimulating significant public health initiatives across various nations. The high prevalence of CKD poses substantial financial burdens on healthcare systems worldwide, leading to increased expenditures associated with the implementation of preventive and therapeutic measures 4. This condition is not only prevalent among chronic diabetic and hypertensive patients, but also afflicts patients with end-stage kidney disease who are on haemodialysis therapy. The prevalence of CKD and its associated risk factors globally and particularly in Iraq is largely uncertain and unstudied.

The present study aims to estimate the prevalence of CKD and determine its associated risk factors among patients attending the dialysis unit of Qayarrha General Hospital. The resulting data reveals an alarming prevalence of CKD and underscores the urgent need to prevent adverse health outcomes.

REFERENCES

1. Ampem Amoako Y, Odai Laryea D, Bedu-Addo G, Andoh H et al. Clinical and demographic characteristics of chronic kidney disease patients in a tertiary facility in Ghana. 2014. ncbi.nlm.nih.gov
2. I Alhazmi A, Hassan A Alghamdi A, Abdulaziz M Alzahrani K, Allah Abdullah B Alzahrani R et al. Leading Causes of Chronic Kidney Disease Among Dialysis Patients in Al-Baha Region, Saudi Arabia. 2023. ncbi.nlm.nih.gov
3. Sodavi M, Shahidi S, Sheibani-Tehrani D. Characteristics of Dialysis Patients in Hemodialysis Centers in Isfahan. 2016. [PDF]
4. Kumela Goro K, Desalegn Wolide A, Kerga Dibaba F, Gashe Fufa F et al. Patient Awareness, Prevalence, and Risk Factors of Chronic Kidney Disease among Diabetes Mellitus and Hypertensive Patients at Jimma University Medical Center, Ethiopia. 2019. ncbi.nlm.nih.gov
5. Dahnan M, M Assabri A, S Khader Y. Risk Factors for End-Stage Renal Failure Among Patients on Hemodialysis in Aljomhory Hospital, Sa'adah Governorate, Yemen: Hospital-Based Case-Control Study. 2019. ncbi.nlm.nih.gov
6. Damtie S, Biadgo B, Wondifraw Baynes H, Ambachew S et al. Chronic Kidney Disease and Associated Risk Factors Assessment among Diabetes Mellitus Patients at A Tertiary Hospital, Northwest Ethiopia. 2018. ncbi.nlm.nih.gov
7. Gbadegesin A, Okunola O, Ayodele O, Arogundade F et al. Renal risk profiling in newly diagnosed hypertensives in an urban population in Nigeria. 2019. ncbi.nlm.nih.gov
8. Bakhshayeshkaram M, Roozbeh J, Taghi Heydari S, Honarvar B et al. A Population-Based Study on the Prevalence and Risk Factors of Chronic Kidney Disease in the Adult Population of Shiraz, Southern Iran. 2019. ncbi.nlm.nih.gov
9. Cha J, Han D. Health-Related Quality of Life Based on Comorbidities Among Patients with End-Stage Renal Disease. 2020. ncbi.nlm.nih.gov
10. Ali A, Mulatu K, Fenta Feleke S, Tadesse Wassie G. Prevalence of chronic kidney disease and associated factors among patients with underlying chronic disease at Dessie Referral Hospital, East Amhara Region, Ethiopia. 2023. ncbi.nlm.nih.gov
11. Alghamdi A, Alaryni A, AlMatham K, Hakami O et al. Knowledge, Attitudes, and Practices of High-Risk Patients towards Prevention and Early Detection of Chronic Kidney Disease (CKD) in Saudi Arabia. 2023. ncbi.nlm.nih.gov
12. Hunegnaw A, Sewunet Mekonnen H, Asmare Techane M, Desta Agegnehu C. Prevalence and Associated Factors of Chronic Kidney Disease among Adult Hypertensive Patients at Northwest Amhara Referral Hospitals, Northwest Ethiopia, 2020. 2021. ncbi.nlm.nih.gov
13. Tao P, Chien CW, Liu C, Zheng J et al. Diabetes mellitus is a risk factor for incident chronic kidney disease: A nationwide cohort study. 2024. ncbi.nlm.nih.gov
14. Damtie S, Biadgo B, Wondifraw Baynes H, Ambachew S et al. Chronic Kidney Disease and Associated Risk Factors Assessment among Diabetes Mellitus Patients at A Tertiary Hospital, Northwest Ethiopia. 2018. ncbi.nlm.nih.gov
15. Kyung Cho Y, Hee Jung C. Metabolically Healthy Obesity: Epidemiology, Criteria, and Implications in Chronic Kidney Disease. 2022. ncbi.nlm.nih.gov
16. Mount P, Davies M, Choy SW, Cook N et al. Obesity-Related Chronic Kidney Disease—The Role of Lipid Metabolism. 2015. ncbi.nlm.nih.gov
17. Pinto KRD, Feckinghaus CM, Hirakata VN. Obesity as a predictive factor for chronic kidney disease in adults: systematic review and meta-analysis. 2021. ncbi.nlm.nih.gov
18. Yacoub R, Habib H, Lahdo A, Al Ali R et al. Association between smoking and chronic kidney disease: a case control study. 2010. ncbi.nlm.nih.gov
19. Tsimihodimos V, Mitrogianni Z, Elisaf M. Dyslipidemia Associated with Chronic Kidney Disease. 2011. ncbi.nlm.nih.gov
20. Visconti L, Benvenga S, Lacquaniti A, Cernaro V et al. Lipid disorders in patients with renal failure: Role in cardiovascular events and progression of chronic kidney disease. 2016. ncbi.nlm.nih.gov
21. Maria Barbagallo C, Baldassare Cefalù A, Giammanco A, Noto D et al. Lipoprotein Abnormalities in Chronic Kidney Disease and Renal Transplantation. 2021. ncbi.nlm.nih.gov
22. Ortiz A, Mattace-Raso F, José Soler M, Fouque D. Ageing meets kidney disease. 2022. ncbi.nlm.nih.gov