Research Article

SAGE Open Medicine

SAGE Open Medicine
Volume 10: 1–9
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DOI: 10.1177/20503121221116942
journals.sagepub.com/home/smo
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Prevalence of chronic kidney disease and associated factors among patients visiting renal unit of St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia: A cross-sectional study design

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Abstract

Objective: This study aimed to assess the magnitude of chronic kidney disease among patients attending the renal unit of St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia.

Methods: Institution-based cross-sectional study was conducted among 620 randomly selected patients who visited St. Paul's Hospital Millennium Medical College renal unit from 1 January to 31 December, 2019. Data on sociodemographic characteristics, clinical conditions, behavioral risk factors, electrolytes, and renal function tests were extracted from patients' medical records. To enter and analyze data, EpiData 3.1 and SPSS 22 were used, respectively. Bivariable and multivariable logistic regression analyses were conducted to see the association between predictor variables and chronic kidney disease. Adjusted odds ratio at 95% confidence interval was used to describe significant association. A p-value <0.05 was considered to declare an association between chronic kidney disease and independent variables.

Results: Of 620 patients, 139 (22.4%; 95% confidence interval: 19.2, 25.6) and 61 (9.8%; 95% confidence interval: 7.4, 12.3) had chronic kidney disease using cut-off value of 90 and 60 ml/min/1.73 m^2, respectively. Having urinary tract obstruction (adjusted odds ratio = 2.32; 95% confidence interval: 1.32, 4.06), hypertension (adjusted odds ratio = 4.06; 95% confidence interval: 2.50, 6.59), diabetes mellitus (adjusted odds ratio = 2.80; 95% confidence interval: 1.62, 4.85), cardiovascular disease (adjusted odds ratio = 2.54; 95% confidence interval: 1.60, 4.01), and age (adjusted odds ratio = 1.83; 95% confidence interval: 1.44, 3.57), family history of chronic kidney disease (adjusted odds ratio = 2.26; 95% confidence interval: 1.36, 3.75) were factors positively associated with having chronic kidney disease.

Conclusion: Nearly, one out of five and one out of ten patients who visited the renal unit had chronic kidney disease using the two thresholds as a cut value. Patients with concomitant urinary tract obstruction, age, hypertension, diabetes mellitus, cardiovascular disease, and a family history of chronic kidney disease were more likely to develop chronic kidney disease. Regular screening for chronic kidney disease, optimal blood sugar, and blood pressure management should be practiced.

Keywords

Chronic kidney disease, hypertension, diabetes mellitus, Ethiopia

Date received: 6 February 2022; accepted: 14 July 2022

Introduction

The international guideline defines chronic kidney disease (CKD) as decreased kidney function as shown by a glomerular filtration rate (GFR) of less than 60 ml/min/1.73 m^2, or markers of kidney damage, or both, of at least 3 months duration, regardless of the underlying cause.[1] The disease has five stages. In stages 1 and 2 (known as early stage), the kidneys are damaged and not working at full strength with

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GFR ⩾90 and GFR 60–89 ml/min/1.73 m^2, respectively. At stage 3 (moderate), about half of kidney function has been lost with GFR 30–59 ml/min/1.73 m^2. In stage 4, there is a severe decrease in GFR of about 15–29 ml/min/1.73 m^2. Stage 5 is known as an end-stage renal failure with a GFR of less than 15 ml/min/1.73 m^2 which necessitates dialysis.[2,3]

Because of an increasing number of risk factors and other noncommunicable diseases, the percentage of the population with CKD is growing at an alarming rate, which is a serious problem for the worldwide population.[4] Globally, the estimated overall prevalence of CKD patients is between 11% and 13% with the majority of them residing in low- to middle-income countries.[5] The prevalence of CKD in the general population of Africa ranged from 2% to 41%.[6] Worldwide, patients with CKD are about 752.7 million.[7] Overall, between 5 and 10 million people died from kidney disease per annum.[8]

Even though, CKD is misconceived as a disease of affluent, developed, and developing nations, it is emerging in several low-income countries, resulting in a double burden on the population.[9,10] In these low-resource settings, end-stage renal disease is often a death sentence for a lot of people since renal replacement therapy is often unavailable or unaffordable.[11] The global increase in CKD is linked to its leading causes, mainly, diabetes mellitus (DM) and hypertension, and risk factors like family history of CKD, aging, and HIV/AIDS.[12,13]

Although a nationwide estimate of CKD is not available in Ethiopia, the rise in the leading causes (hypertension and DM), epidemiological transition, and increasing urbanization[9,10] necessitates studying the prevalence of CKD and its predictors in Ethiopia. Few existing studies conducted in Ethiopia failed to include key factors, like renal function tests and electrolyte findings. Additionally, they are inadequate in sample size and include only those at high risk like those having a hypertensive and cardiovascular disease (CVD) rather than those who visited the nephrology department.[14–16] Therefore, this study aimed to assess the prevalence of CKD and its predictors among patients visiting the renal unit of St. Paul's Hospital Millennium Medical College (SPHMMC), Addis Ababa, Ethiopia.

Materials and methods

Study area and period

We conducted the study from 1 to 31 July, 2020, at the renal unit of SPHMMC, the second-largest hospital having 700 beds serving over 5 million population.[17] The renal unit in SPHMMC is the only established renal center in public facilities for renal transplants since 2015. It is also one of the few dialysis centers in Ethiopia. The unit provides comprehensive inpatient and outpatient care for people with kidney disease, including CKD. During the study period, eight consultant nephrologists and 72 nurses ran the unit.

Ethical considerations

The study was conducted according to the Helsinki Declaration of medical research ethics.[18] Ethical clearance was obtained from Haramaya University, College of Health and Medical Sciences, Institutional Health Research Ethics Review Committee (IHRERC). Permission was obtained from the head of both the renal unit and the medical record office of SPHMMC. Informed, voluntary, written, and signed consent was obtained from legally authorized representatives (hospital administrators and head of medical record office) and approved by Institutional Review Board of Haramaya University (IHRERC) with a reference number (IHRERC/083/2020). There was no direct contact with patients and anonymity was maintained by using the identified number instead of the patient's name. Besides, the confidentiality of the data was kept and used for the study purpose only.

Study design and participants

An institution-based cross-sectional study was used. All adult patients (⩾18 years) who visited the renal unit from 1 January to 31 December, 2019, were the study population. All adult patients with all renal problems visiting the renal unit were included in the study. Adult patients with incomplete information in their medical records, those referred to other places, and those who left against medical advice were excluded.

Sample size determination and sampling technique

To calculate sample size, a single population proportion formula was used with the following assumptions: estimated proportion of CKD of 38.6%,[19] 95% confidence level, the margin of error (=0.04), and 10% nonresponse rate; hence, a minimum of 626 participants were required to conduct the study. The total number of clients who visited the renal unit of SPHMMC from 1 January to 31 December, 2019, was 5760. The sampling frame was prepared for those study populations by using their Medical Registration Number obtained from their medical records. Finally, the study participants that had been included in the study were identified by using a simple random sampling technique (computer based) from the sampling frame (N = 5760).

Measurement and data collection techniques

Data were extracted by reviewing medical records using an adapted checklist from previous similar literature[16,19,20] and modified to make it suit the local context. The checklist was validated for internal consistency (Cronbach's alpha = 0.70) after the pretest was done. Data on sociodemographic characteristics, chronic conditions (hypertension, DM, CVD, and

liver disease), laboratory investigations (proteinuria, serum creatinine, urea, Na^+, and K^+), and behavioral factors such as alcohol drinking, smoking status, and nonsteroidal anti-inflammatory drugs (NSAID) use were extracted from the medical record. For patients with multiple laboratory investigations, only the initial laboratory investigation used for the diagnosis was used. Patients were considered alcohol drinkers if he/she is/was an alcohol drinker of any amount, or type, and recorded on the medical record. Again, patients were considered cigarette smokers if he/she is/was currently or previously having the habit of smoking and recorded on their medical records.

CKD was defined at GFR cut-off value of <90 ml/min/1.73 m^2 or markers of kidney damage or both for a duration greater than 3 months and GFR cut-off value of <60 ml/min/1.73 m^2 or "No" otherwise. Data were collected by six bachelor's degree holders and supervised by two M.Sc. nurses.

Data quality assurance and management

The checklist was pretested on 31 medical records (5% of sample size) in Tikur Anbessa Specialized Hospital before actual data collection and necessary amendments were done. Before data entry and analysis, the data were checked for completeness, accuracy, and clarity by supervisors and the principal investigator. Extensive training was given to data collectors and supervisors on the purpose of the study, the sampling procedure, and how to extract data from medical records.

Statistical analysis

The data were coded, edited, cleaned, and entered into EpiData 3.1 and then exported to SPSS version 22 for analysis. Data were summarized and presented using descriptive statistics. The information was presented using frequencies, percentages, and tables.

Initially, the association between CKD and predictor variables was analyzed by using a bivariate logistic regression model. All variables with a p-value $\leqslant 0.25$ in the bivariate logistic regression were retained and included in the final model of multivariable logistic regression analysis using forward step-wise approaches methods to control all possible confounders. The model goodness of fit was tested by the Hosmer–Lemeshow statistic and Omnibus test. The model was considered a good fit since it is found to be insignificant for the Hosmer–Lemeshow statistic ($p = 0.310$) and significant for the Omnibus test ($p < 0.001$).

The multicollinearity test was carried out to observe the correlation between independent variables using variance inflation factor (VIF) and standard error. No variables were observed with a VIF of >3 and standard error >2. To present factors that have a significant association with the outcome variable, and adjusted odds ratio (AOR) at a 95% confidence interval (CI) was used. A p-value <0.05 was considered to declare an association between CKD and independent variables.

Table 1. Sociodemographic characteristics of adult patients, 2021 ($n = 620$).

Variables	Categories	Frequency	Percentage
Age in years	<60	465	78.2
Sex	Male	318	51.3
Residence	Addis Ababa	387	62.4
	Out of Addis Ababa	233	37.6
Educational status	No formal education	111	17.3
	Primary	24	3.9
	Secondary	91	14.7
	Tertiary	394	63.5
Marital status	Single	116	18.7
	Married	436	70.3
	Divorced	33	5.3
	Widowed	35	5.6
Occupation	Student	98	15.8
	Employed	233	37.6
	Self-employed	192	31.0
	Retired	73	11.8
	Unemployed	24	3.9

Results

Sociodemographic characteristics

Out of 626 selected patients, six patients who had incomplete medical records were excluded. A total of 620 medical records of CKD patients were included in the analysis. The age range was from 18 to 99 years old. The median age was 45 and (interquartile range 31–60). Four hundred and sixty-five patients (78.2%) were less than 60 years old and 142 (22.9%) of patients have a family history of CKD (Table 1).

The magnitude of CKD

By using a GFR cut-off value of 90 ml/min/1.73 m^2, a total of 139 (22.4%; 95% CI: 19.2, 25.6) patients had CKD whereas 61 (9.8%; 95% CI: 7.4, 12.3) patients had CKD using GFR cut-off value of 60 ml/min/1.73 m^2. The majority of them were in stage 1 (24.5%) and 2 (31.7%). Fifteen (10.8%) patients were on dialysis and one patient (5.9%) was referred for a kidney transplant. Nephrotic syndrome and glomerular disease were the major kidney problems reported in 153 (31.8%) and 133 (27.7%) patients (Table 2).

Clinical risk factors

One hundred and ten (17.7%) patients had urinary tract infections (UTIs); among them, 53 (48.2%) and 40 (36.4%) had pyelonephritis and urethritis, respectively. Urinary tract

Table 2. CKD and related characteristics of adult patients, 2021 ($n=620$).

Variables	Categories	Percentage	Frequency
Stage of CKD ($n=139$)	Stage 1	34	24.5
	Stage 2	44	31.7
	Stage 3	20	14.4
	Stage 4	24	17.3
	Stage 5	17	12.2
Number of dialysis per week ($n=15$)	3 times	14	93.3
	2 times	1	6.7
Reasons for visiting unit ($n=481$)	Acute renal failure	120	24.9
	Nephrotic syndrome	153	31.8
	Glomerular disease	133	27.7
	Polycystic kidney disease	52	10.8
	Others*	23	4.8
Type of acute renal failure ($n=120$)	Prerenal	43	35.8
	Intrarenal	63	52.5
	Post-renal	14	11.7

CKD: chronic kidney disease; Others*: nephritis syndrome, lupus nephritis.

obstruction was documented in 83 (13.4%) patients. In addition, 174 (28.1%), 103 (15.3%), and 171 (27.6%) had hypertension, DM, and CVD, respectively. Family history of CKD was documented in 142 (22.9%) of the study participants' medical records (Table 3).

Behavioral factors

Forty-two patients (6.8%) were smokers and 88 (14.2%) patients were alcohol drinkers. One hundred and five patients (16.9%) were frequent nonsteroidal anti-inflammatory drug users.

Laboratory findings

A total of 93 (15%) and 441 (71.1%) had high cholesterol level (>200 mg/dl) and positive proteinuria (⩾+1), respectively. Hyponatremia (low sodium) and hyperkalemia (high potassium) were documented in 322 (51.4%) and 136 (21.9%) patients, respectively (Table 4).

Factors associated with CKD (using 90 ml/min/1.73 m^2 cut-off value)

In the binary logistic regression analysis, age, urinary tract obstruction, hypertension, DM, CVD, family history of CKD, alcohol intake, and use of NSAID medications were associated with CKD. However, in the multiple logistic regression, only urinary tract obstruction, hypertension, DM, CVD, and family history of CKD were independently associated with CKD.

Patients having urinary tract obstruction were 2.32 times (AOR=2.32; 95% CI: 1.32, 4.06) more likely to have CKD as compared to patients without urinary tract obstruction. The odds of having CKD were 4.06 times higher among hypertensive

Table 3. Causes and clinical risk factors of CKD among adult patients, 2021 ($n=620$).

Variables	Categories	Frequency	Percent
Hypertension	Yes	174	28.1
Duration of hypertension ($n=174$)	>10	111	63.8
DM	Yes	98	15.8
Duration of DM (years; $n=98$)	>10	46	46.9
Type of DM ($n=98$)	Type 1	9	9.2
CVD	Yes	171	27.6
Liver disease	Yes	41	6.6
Kidney cancer (malignancy)	Yes	21	3.4
HIV serostatus	Positive	11	1.8
UTI	Yes	110	17.7
Types of UTI ($n=110$)	Pyelonephritis	53	48.2
	Urethritis	40	36.4
	Cystitis	14	12.7
	Others	3	2.7
Urinary tract obstruction	Yes	83	13.4
Type of urinary tract obstruction ($n=83$)	BPH	31	37.4
	Renal stone	28	33.7
	Tumor	22	26.5
	Others	2	2.4
Autoimmune disease	Yes	12	1.9
History of recurrent kidney infection	Yes	144	23.2
Tonsillitis	Yes	9	9.0
Glomerulonephritis	Yes	166	26.8

CKD: chronic kidney disease; DM: diabetes mellitus; CVD: cardiovascular disease; UTI: urinary tract infection.

Table 4. Description of laboratory findings of patients, 2021 ($n=620$).

Variables	Categories	Frequency	Percentage
Cholesterol level	High (⩾200 mg/dl)	93	15
Proteinuria (albuminuria)	Positive	441	71.1
Serum creatinine	Low (<0.5 mg/dl)	4	0.6
	Normal	166	26.8
	High (>1.3 mg/dl)	450	72.6
Urea	Low (<15 mg/dl)	28	4.5
	Normal	187	30.2
	High (>45 mg/dl)	405	65.3
Phosphorus	Low (<2.5 mg/dl)	111	17.9
	Normal	226	36.5
	High (>4.5 mg/dl)	283	45.6
Serum sodium level	Low (<135 mmol/L)	322	51.9
	Normal	282	45.5
	High (>145 mmol/L)	16	2.6
Serum potassium level	Low (<3.5 mmol/L)	84	13.5
	Normal	400	64.5
	High (>5.5 mmol/L)	136	21.9
Serum chloride level	Low (<97 mmol/L)	52	8.4
	Normal	328	52.9
	High (>107 mmol/L)	240	38.7

Table 5. Factors associated with CKD (using GFR 90 ml/min/1.73 m^2 cut-off value) among patients, 2021 ($n = 620$).

Variable	CKD		COR (95% CI)	AOR (95% CI)	*p*-Values
	Yes	No			
Age (years)					
>60	51	84	2.73 (1.80, 4.15)**	1.42 (0.86, 2.33)	0.119
<60	88	397	1	1	
Urinary tract obstruction					
Yes	35	48	3.03 (1.86, 4.93)**	2.32 (1.32, 4.06)*	0.003
No	104	433	1	1	
Hypertension					
Yes	80	94	5.58 (3.72, 8.36)**	4.06 (2.50, 6.59)**	<0.001
No	59	387	1	1	
DM					
Yes	51	47	5.35 (3.38, 8.45)**	2.80 (1.62, 4.85)**	<0.001
No	88	434	1	1	
CVD					
Yes	67	104	3.37 (2.26, 5.01)**	2.54 (1.60, 4.01)**	<0.001
No	72	377	1	1	
Family history of CKD					
Yes	43	99	1.72 (1.13, 2.63)**	2.26 (1.36, 3.75)*	0.044
No	96	382	1	1	
Alcohol consumption					
Yes	31	57	2.13 (1.31, 3.47)	1.26 (0.71, 2.24)	0.404
No	108	424	1	1	
Use of NSAID					
Yes	33	79	1.58 (1.00, 2.50)*	1.36 (0.80, 2.32)	0.101
No	106	402	1	1	

CKD: chronic kidney disease; GFR: glomerular filtration rate; COR: crude odds ratio; AOR: adjusted odds ratio; DM: diabetes mellitus; CVD: cardiovascular disease; NSAID: nonsteroidal anti-inflammatory drugs; * = $p < 0.05$, and ** = $p < 0.001$.

patients compared to patients without hypertension. The risk of having CKD among diabetic patients was 2.80 times higher compared to nondiabetic patients. Again, having CVD increases the risk of developing CKD by 2.54 times compared to patients without CVD. Having a family history of CKD increases the risk of developing CKD by 2.26 times compared to patients with no family history of CKD (Table 5).

Factors associated with CKD (using 60ml/min/1.73m2 cut-off value)

In the binary logistic regression analysis, age, hypertension, DM, CVD, and family history of CKD were associated with CKD. However, in the multiple logistic regression, age, hypertension, DM, and CVD were independently associated with CKD.

Patients aged greater than 60 years old were 1.83 times more likely to develop CKD compared to those below 60 years old. The odds of having CKD were 4.61 times higher among hypertensive patients compared to patients without hypertension. The risk of having CKD among diabetic patients was 2.43 times higher compared to non-diabetic patients. Again, having CVD increases the risk of developing CKD by 2.55 times compared to patients without (Table 6).

Discussion

The finding from our study shows that 139 (22.4%; 95% CI: 19.2, 25.6) and 61 (9.8%; 95% CI: 7.4, 12.3) patients had CKD using GFR cut-off value of 90 and 60 ml/min/1.73 m^2, respectively. Using the above thresholds, slightly more than one in five and one in ten patients who visited the renal unit for renal consultations had CKD. Patients with urinary tract obstruction, hypertension, DM, CVD, having a family history of CKD, and age (⩾60 years old) were more likely to develop CKD.

Using a 90 ml/min/1.73 m^2 cut-off value, the overall proportion of CKD in our study is lower than the result of a study conducted in public hospitals in Addis Ababa (38.6%).[19] This may be due to a lower proportion of hypertension (28.1%) and DM (15.8%) among patients visiting the renal unit of SPHMMC compared to the patients who attended public hospitals of Addis Ababa, which were 83.6% and 18.2%, respectively.[19] Because, the increase in diabetic and hypertension conditions has a linear relationship with CKD, the difference in the proportion of the two noncommunicable diseases (DM and hypertension) elevates the finding of the study conducted in the public hospital of Addis

Table 6. Factors associated with CKD (using GFR 60 ml/min/1.73 m^2 cut-off value) among patients, 2021 ($n = 620$).

Variable	CKD		COR (95% CI)	AOR (95% CI)	*p*-Values
	Yes	No			
Age (years)					
>60	29	106	2.30 (1.14, 4.66)	1.83 (1.44, 3.57)*	0.040
<60	32	453			
Hypertension					
Yes	54	141	5.08 (2.05, 12.62)	4.61 (1.63, 13.01)**	<0.001
No	7	418			
DM					
Yes	39	76	2.99 (1.49, 6.00)	2.43 (1.07, 5.50)*	0.032
No	22	483			
CVD					
Yes	38	138	2.13 (1.07, 4.23)	2.55 (1.17, 5.55)*	0.018
No	23	421			
Family history of CKD					
Yes	17	119	1.42 (0.780, 2.68)	1.13 (0.82, 5.53)	0.074
No	44	440			

CKD: chronic kidney disease; GFR: glomerular filtration rate;
COR: crude odds ratio; AOR: adjusted odds ratio; DM: diabetes mellitus; CVD: cardiovascular disease; * = $p < 0.05$, and ** = $p < 0.001$.

Ababa.[21] Variations in the study period and sample size might also contribute to the differences.

Using the same cut-off value, our finding is, however, higher than other studies conducted in Addis Ababa Zewditu Memorial Hospital (12.2%),[22] Sudan (10.32%),[23] Nigeria (18.8%),[24] Botswana (13.5%),[25] Senegal (4.9%),[26] Iran (18.9%),[27] China (10.49%),[28] Korea (13.7%),[29] and Nepal (10.6%).[30] The patient flow at St. Paul's millennium medical college is high compared to Zewuditu Memorial Hospital because of skilled professionals and services like the kidney transplant center (the only renal transplant center), which might be a pulling factor for patients with a different form of kidney disease. In addition, sociodemographic and socioeconomic variation between Ethiopia and Nigeria, Korea, and China might contribute to the difference. Health-seeking behavior of the society like a regular checkup at a primary health center before the disease progressed to the advanced stage of kidney disease. CKD is quite different among the population of those countries. Another justification may be because of differences in the genetic makeup of society (blacks face a higher risk for kidney failure as explained by diabetes and hypertension being common in those people[31]). The differences in the study population, lifestyle of study participants, sample size, or differences in availability of health-care services and utilization may also contribute to the differences.[9]

Using 60 ml/min/1.73 m^2 cut-off value, our study finding was lower than the study conducted in Japan (20%).[32] The possible reason for the discrepancy could be due to the differences in study population, sample size, and study setting. In Japan, the study was conducted among the general population, and a larger sample size elevates the finding.[32] However, using the same cut-off value, our finding was higher than the study conducted in Korea (5%).[29] The differences in study area and socioeconomic status might contribute for the observed discrepancies. The high coverage of health care and presence of an early screening system of chronic diseases like CKD prevent the disease progress to the advanced stage (stages 3–5).[33]

In congruence with the previous finding in Addis Ababa, patients with urinary tract obstruction were more likely to develop CKD than patients who did not have urinary tract obstruction (using 90 ml/min/1.73 m^2).[19] This may be due to blockage, which might inhibit the flow of urine, which results in its collection in the renal pelvis, causing further swelling of the kidney and applying pressure on its internal structures (hydronephrosis). The elevated pressure due to the obstruction may finally damage the kidney tissues and can result in a decrease in kidney function which may eventually result in CKD.[34] Anatomical obstruction of the urinary tract may result from a recurrent infection of the urinary tract resulting in thickening and scarring of renal pelvis which affect the normal functioning of the nephrons of the kidney.[35]

In our study (using both thresholds), the risk of having CKD was higher among hypertensive patients than in those who did not have hypertension. Hypertension is a well-known cause of CKD.[36–39] This is consistent with other study results.[14,29,40,41] This might be because a decrease in renal perfusion leads to renal damage and an increase in blood pressure results in the hardening of small arteries with impaired renal function.[42] GFR and protein in the urine should be monitored for hypertensive patients at a constant interval for earlier screening of CKD to take appropriate measures. So, strict control of high blood pressure with

antihypertensive medications is essential in reducing the progression rate of renal damage to an advanced stage of CKD.[43–45]

Using both thresholds, the odds of having CKD were higher among diabetic patients compared to nondiabetic patients. This aligns with studies conducted in Tigray, North West Ethiopia, Korea, and Singapore.[14,20,29,41] This might be linked with diabetic nephropathy which damages the microvasculatures of the kidney. So, glycemic control through diet, exercise, and medication is recommended.[46]

Patients with CVD were more likely to develop CKD compared to their counterparts (using both thresholds), which is in line with previous studies.[41,47,48] This is because, without a steady blood supply from the heart, the kidneys cannot filter wastes from the blood leading to the accumulation of waste products that harm the kidney.[49] CVD disturbs the pumping power of the heart. As a result, the amount of blood and oxygen supplied to the kidneys is reduced and the kidney tissues are deprived of oxygen, which can lead to CKD.[50]

Those patients aged ⩾60 years old were more likely to develop CKD compared to those below 60 years old (using 60 ml/min/1.73 m^2), supported by the study conducted in Korea.[29] Advanced age is a well-known risk factor for CKD and independent causes of CKD like DM, hypertension, and CVD increase with aging.[51,52] In addition, there is a decreased renal function in old age.[53]

Similarly, patients with a family history of CKD were more likely to develop CKD compared to patients without a family history (only using 90 ml/min/1.73 m^2). This same finding was reported by studies from southern Ethiopia and El Salvador.[47,48] The possible justification would be that people in a family group tend to exhibit similar life habits, behaviors, and life choices. Besides this, CKD is genetically related and common among first-degree relatives and has a greater risk for CKD.[54] So, screening of CKD in specific at-risk groups, such as those with hypertension, diabetes, CVD, and family history of CKD by using key markers of kidney damage like urine and blood tests (abnormal urine albumin levels and a persistent reduction in the estimated GFR during the routine medical assessment is crucial.[55]

Limitation of the study

Since the study was cross-sectional, it cannot show the cause–effect relationship between CKD and independent variables. Since the medical records were used, the physician might be likely to miss diagnose a client as having CKD. Since this study was institutional, this might affect the generalizability of the study.

Conclusion

Almost one in five and one in ten patients visiting SPHMMC renal unit had CKD. Patients with urinary tract obstruction, hypertension, DM, CVD, family history of CKD, and age (⩾60 years old) were likely to develop CKD. So, early screening for CKD, optimal management of blood sugar and blood pressure, and treating hypertensive, diabetic, and CVD should be practiced for preventing the occurrences of CKD and its possible complications.

Acknowledgements

We are grateful to data collectors for their admirable endeavors. Also, our appreciation goes to Haramaya University, College of Health and Medical Sciences, and Saint Paul's Hospital millennium staff for their continuous support and collaboration during the thesis work.

Author contributions

A.S. designed the study, performed statistical analysis, and drafted the article. T.W. participated in the study design and statistical analysis. G.F. and A.K. drafted the article. These authors contributed equally to this work, read and approved the final version of this article.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Ethical clearance was obtained from Haramaya University, College of Health and Medical Sciences, Institutional Health Research Ethics Review Committee (IHRERC) with a reference number (IHRERC/083/2020). Permission was obtained from the head of both the renal unit and the Medical Record Office of SPHMMC.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The study was funded by Haramaya University. But the funding institution has no role in the publication consent or approval.

Informed consent

After the study was approved, permission was obtained from the head of the renal unit and the medical record office of SPHMMC to get the medical records of patients. All findings were kept confidential.

Trial registration

Not applicable.

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Availability of data and materials

The data set generated or analyzed during the current study are not publicly available due to the privacy of the participants and institution restriction but are available from the corresponding author on reasonable request.

Supplemental material

Supplemental material for this article is available online.

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