MITIKU MINKSEW

PREVALENCE AND ASSOCIATED FACTORS OF CHRONIC KIDNEY DISEASES AMONG HYPERTENSIVE PATIENTS IN SEL...

Thesis

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COLLEGE OF HEALTH SCIENCES

SCHOOL OF NURSING AND MIDWIFERY

DEPARTMENT OF NURSING

PREVALENCE AND ASSOCIATED FACTORS OF CHRONIC KIDNEY DISEASES AMONG HYPERTENSIVE PATIENTS IN SELECTED PUBLIC HOSPITALS, ADDIS ABABA, ETHIOPIA, 2025

BY: MITIKU MINKSEW (BSC)

MAY, 2025

ADDIS ABABA, ETHIOPIA

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THESIS RESEARCH SUBMITTED TO THE SCHOOL OF NURSING AND MIDWIFERY DEPARTMENT OF ADULT HEALTH NURSING, FOR PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN ADULT HEALTH NURSING.

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APPROVAL SHEET

RESEARCH AND COMMUNITY SERVICE

I, the undersigned, member of the board of examiners of the thesis defense by **MITIKU MINKSEW (BSC),** have read and evaluated his/her thesis/entitled **"prevalence and associated factors of chronic kidney diseases among hypertensive patients in selected public hospitals**, **Addis Ababa, Ethiopia."**, and examined the candidates. This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the degree of **Adult Health Nursing**.

Approved By:

Principal Advisor Name

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ACRONYMS AND ABBREVIATIONS

BSc: Bachelor of Science

CKD: Chronic kidney disease

CVD: Cardiovascular disease

DM: Diabetes mellitus

ESRD: End-stage renal disease

ETB: Ethiopian Birr

FBS: Fasting Blood Sugar

FMOH: Federal Ministry of Health

G.C.: Gregorian calendar

GFR: Glomerular filtration rate

HTN: Hypertension

LMICs: Low- and middle-income countries

NCD: No communicable disease

OHA: Oral Hyperglycemic Agent

OPD: Outpatient department

RBS: Random Blood Sugar

SPHMMC: St Paul's Hospital Millennium Medical College

TASH: Tikur Anebessa Specialized Hospital

USD: United States Dollar

WHO: World Health Organization

ABSTRACT

Background: Chronic kidney disease is a progressive decline in kidney function, characterized by structural or functional abnormalities lasting over three months, often detected through reduced glomerular filtration rate, abnormal blood or urine tests, or imaging. Chronic kidney diseases progresses through five stages based on glomerular filtration rate, ranging from normal function to kidney failure. Hypertension is a major risk factor for chronic kidney diseases, which if untreated, can lead to kidney failure.

Objectives: To assess the prevalence and factors associated with chronic kidney disease among hypertensive patients on follow-up in a selected public hospital in Addis Ababa, Ethiopia, 2025.

Methods: 233 hypertensive patients were recruited for follow-up in specific public hospitals between December 21 and January 21, 2025, using a cross-sectional study design. A basic random sampling technique was used to choose the participants, and questionnaires for in-person interviews, reviews of medical charts, and laboratory forms were used to gather data. For analysis, every piece of data was exported from Excel into SPSS version 27. The results were displayed using tables and charts after descriptive statistics were calculated to characterize the frequency, percentages, and distributions of the sample. Bivariate and multivariable variables were included in a binary logistic regression analysis; variables with a p-value < 0.05 were deemed linked to chronic kidney diseases.

Result: Chronic kidney disease was present in 22.3% (95% CI: 22.5%, 33.8%) of patients with hypertensive follow-up at specific public hospitals. Factors including residence (AOR=11.50, 95% CI: 3.24-40.77), hypertension stage (AOR=7.25, 95% CI: 1.60-32.86), and duration of hypertension (AOR=16.14, 95% CI: 4.40-59.21) were significantly linked to chronic kidney disease in multivariate logistic analysis**.**

Conclusion: According to this study, 22.3% of hypertensive patients had chronic kidney disease. In terms of contributing factors, the incidence of chronic kidney disease in hypertensive patients is correlated with living in a rural area, having advanced hypertension, and having had hypertension for more than ten years.

Key Words: Hypertension, Chronic kidney disease, prevalence, Ethiopia

1. INTRODUCTION

1.1 BACKGROUND

A progressive deterioration in kidney function, which lowers the kidneys' ability to filter waste and carry out vital body functions, is the hallmark of chronic kidney disease (CKD) (1). A decrease in glomerular filtration rate (GFR) or structural or functional abnormalities in the kidneys are other names for chronic kidney disease and, these abnormalities may be detected through unusual findings in blood or urine tests, imaging results, or a consistently reduced GFR over a period of at least three months, all of which can have significant health consequences (2). Chronic kidney disease progresses through various stages, each impacting an individual's health differently.

In the early stages, patients may exhibit albuminuria and a normal or slightly decreased glomerular filtration rate (GFR). Complete kidney failure or end-stage renal disease (ESRD) may eventually result from the progression of the illness (3–5). Even so, more research is still needed to determine the cause of CKD (6). The main risk factor for CKD is thought to be hypertension (7). Although treatment has been shown to slow the progression of chronic kidney disease (CKD), the condition typically worsens over time (8). According to eGFR, patients with chronic kidney disease (CKD) divided the disease into five stages, which are as follows: Stage 1: GFR ≥90 mL/min/1.73 m2 (normal or high); Stage 2: GFR = 60-89 mL/min/1.73 m2 (mildly decreased); Stage 3a: GFR = 30-59 mL/min/1.73; Stage 4: GFR = 15-29 mL/min/1.73 m2 (severely decreased); and Stage 5: (9).

New diagnostic standards for CKD that include abnormalities in one of the following markers for longer than three months were established by the Kidney Diseases International Global Outcome (KDIGO) in 2020. 1. Albuminuria (excretion of albumin >30 mg/24 hours or albumin: creatinine ratio >30 mg/g [>3 mg/mmol], 2. abnormalities of urine sediment (casts of RBCs, WBCs, and hyaline), 3. electrolyte disturbance and other abnormalities resulting from tubular disorders. 4. Abnormalities in histology by renal biopsy. 5. Anatomical anomalies identified by ultrasonography or 6. Kidney transplant history in such a situation (10). CKD has negative social and economic effects and is linked to an increase in CVD and premature mortality (1).

1.2 STATEMENT OF THE PROBLEM

One of the conditions with the highest rates of morbidity and mortality worldwide is chronic kidney disease (CKD) (11). Because of its steadily increasing incidence and strong correlation with illness and death, chronic kidney disease (CKD) is a public health concern that needs to be addressed immediately (12). According to research conducted by the World Health Organization (WHO), the prevalence of chronic kidney disease (CKD) was 13.4% in the general population 13), and the pooled prevalence of CKD in patients with hypertension was found to be higher than that of the general population, which is 24.7% (12). The most common risk factor and cause of chronic kidney disease is hypertension, which was more common than in the general population (2).

More than 697 million new cases of chronic kidney disease (CKD) were reported worldwide in 2019, and the condition was responsible for about 1.2 million deaths or 7.6% of all deaths worldwide. CKD was the 10th most common cause of death globally by 2022, and estimates suggest that it will be the 5th most common cause of years of life lost by 2040 (14). Chronic kidney disease (CKD) was ranked as the 17th leading cause of years of life lost globally in the Global Burden of Disease 2015 study. It is also one of the major causes of death that is rapidly increasing, with mortality rates from CKD increasing by 31.7% between 2005 and 2015 (15).

A significant financial burden is also linked to chronic kidney disease (13). More than two to three percent of the annual healthcare budget in high-income nations goes toward treating end-stage renal disease (ESRD) (16). Despite making up only 0.03% of the population, end-stage kidney disease is more common in those with lower socioeconomic status (17). The burden of CKD is significantly higher in developing nations due to the additional risks of poverty, such as infections, dangerous jobs, inadequate education, and poor maternal health, as well as the higher expense of screening and treatment, which patients must pay for themselves (14) Due to limited access to dialysis or transplantation, more than half of all patients in need of renal replacement therapy passed away globally (18).

Furthermore, compared to high-income countries, the prevalence is thought to be 15% greater in lower- and middle-income countries (1).

In India, Korea, Pakistan, and Southern China, the general population's prevalence of chronic kidney disease (CKD) was 17.2%, 13.7%, 12.5%, and 9.4%, respectively (7,19,20). According to a systematic review of the African continent, the prevalence of CKD varies between 2% and 41% while the prevalence of hypertension in patients varies between 13% and 51% (21).

According to the results of this systematic review, the prevalence of chronic kidney disease (CKD) was 45.7% in Burundi, 40.8% in Mali, 29.7% in Nigeria, 18% in Egypt, 15.3% in Seychelles, 15.2% in Uganda, 12.4% in Congo, 11.5% in Kenya, 10.2% in Ghana, 10% in Cameroon, 7.4% in Tanzania, 6.4% in Sudan, 6.1% in Senegal, and 2.9% in Morocco (22).

In contrast, the prevalence of chronic kidney disease (CKD) among hypertensive patients was 22% at the Tigray Teaching Hospital, 26 percent at Jimma University, 17 point 6 percent at Gondar University, and 20 point 5 percent at Ambo University in Ethiopia (1,7,23,24).

Many characteristics, such as age, sex, education, residence, marital status, body mass index, comorbidities, type of anti-hypertensive medication, smoking, alcohol use, and a sedentary lifestyle, have been associated with chronic kidney disease (CKD), according to research done globally (7). Hypertension enhances the progression of end-stage renal disease (ESRD) and is a risk factor for CKD in and of itself. In low- and middle-income environments, managing chronic kidney disease (CKD) in general and hypertensive patients in particular can be difficult (19,20,25,26). Patients with hypertension are not regularly offered CKD screening in these settings because screening tests are unavailable, there are no structured procedures in place to manage hypertension and other NCDs, and financing for NCD care is restricted (27).

Furthermore, the high expense of treating chronic kidney disease (CKD), inadequate infrastructure, and the exclusion of CKD from NCD policies and strategies all make managing CKD difficult. Dialysis and renal replacement therapy are often unavailable, so patients with end-stage renal disease (ESRD) frequently lack access to these treatment options. Therefore, this study aims to fill that gap by providing robust and concrete data on the prevalence of CKD and its associated risk factors among hypertensive patients in Ethiopia.

1.3 SIGNIFICANCE OF THE STUDY

Chronic kidney disease (CKD) is increasing at an alarming rate worldwide, accompanied by a corresponding rise in cases of end-stage renal disease (ESRD) and related mortality. One of the primary drivers of CKD is hypertension, which is recognized as the leading cause of ESRD and the subsequent need for renal replacement therapies, such as dialysis or kidney transplantation. If hypertension is left uncontrolled or inadequately managed, it can lead to progressive kidney damage, ultimately resulting in kidney failure along with various other serious health complications. Once kidney function declines severely, life-sustaining interventions like dialysis or transplantation become essential for survival. These treatments, however, place considerable physical, emotional, and financial burdens on patients, their families, and healthcare systems—particularly in low- and middle-income countries where access to such care may be limited or inconsistent.

The impact of CKD extends beyond individual health, contributing significantly to the global healthcare burden through increased hospitalizations, long-term disability, and high healthcare costs. Moreover, CKD often coexists with other chronic conditions such as diabetes and cardiovascular diseases, compounding morbidity and complicating treatment strategies. This interrelationship highlights the importance of early detection and integrated management approaches to reduce disease progression and improve patient outcomes.

In Ethiopia, the available research on CKD prevalence among hypertensive patients remains sparse, with most existing studies focusing primarily on patients who already present with multiple comorbidities. Despite the clear implications of CKD in hypertensive populations including increased risks of morbidity, mortality, and complex treatment decisions there is a significant gap in comprehensive data addressing this issue at a national level. This lack of evidence hinders effective healthcare planning and resource allocation.

The findings will enable healthcare professionals, policymakers, and other stakeholders to develop targeted interventions and policies designed to reduce the burden of CKD in this vulnerable population. Such measures may include strengthening hypertension management protocols, promoting regular kidney function screening, and implementing patient education programs focused on lifestyle modification and medication adherence.

By identifying high-risk individuals early and facilitating timely intervention, this study has the potential to improve clinical outcomes, reduce hospital admissions, and lower healthcare costs. The study's insights could support regional efforts to enhance CKD prevention, optimize patient management, and ultimately improve the quality of life for patients living with these chronic conditions. Therefore, this study aims to fill that gap by providing robust and concrete data on the prevalence of CKD and its associated risk factors among hypertensive patients in Ethiopia.

2. LITERATURE REVIEW

2.1 Concept of chronic kidney disease

Globally, the incidence and prevalence of chronic kidney disease are rising, with estimates ranging from 10% to 13% (28). According to one study on the prevalence and contributing factors of chronic kidney disease in Ethiopia, this condition is a global public health concern that, if left untreated, can lead to renal failure and early death (29). Chronic kidney disease is more common in people who have other non-communicable diseases, like hypertension, which is According to a recent study; chronic kidney disease is twice as common in African hypertension patients 35.6% than in the general population (30).

Research on the prevalence of chronic kidney disease and the risk factors associated with it is still lacking in developing nations. This could give the false impression that chronic kidney disease is not a significant issue in sub-Saharan Africa because of a lack of awareness among the general public, medical professionals, the government, and other funders (12). As Hypertension is an independent risk factor for chronic kidney disease, it quickens the progression of chronic kidney disease to end-stage renal disease. Chronic kidney disease in general and hypertensive patients in particular might be difficult to manage in low- and middle-income environments (25).

2.2 Prevalence of chronic kidney diseases

Chronic kidney disease (CKD) is a major public health concern among hypertensive patients, with a global prevalence of CKD of 34.97% (31). A thorough investigation into the prevalence and risk factors for chronic kidney diseases in adult hypertensive patients was conducted in the United States of America in 2018. In (32) the prevalence of chronic kidney disease was 9.5% (32).

According to a cross-sectional study, 15.3% of hypertensive patients with outpatient follow-up in China had chronic kidney disease (33). According to a Japanese study titled "Prevalence of and Factors Associated with Chronic Kidney Disease in Japanese Subjects without Notable Chronic Diseases, undergoing an Annual Health Checkup," 20.6% of patients had hypertension (34). A study done in Sierra Leone in 2021, which is a cross-sectional study on the topic of High

Prevalence of Chronic Kidney Disease among People Living with Hypertension in Rural Sierra Leone, shows that the prevalence of renal impairment and chronic kidney disease was 29.9% (30).

Chronic kidney disease was found to be 17.2% common in hypertensive patients aged ≥ 18 years in a cross-sectional study carried out in Uganda (10). According to another systematic review and meta-analysis study, 21% of Ethiopians had chronic kidney disease (35). 17.8% of hypertensive patients had chronic kidney disease, according to a cross-sectional study done in the general population of three northern Senegal regions (14).

According to a study done in Nigeria, 50% of patients with hypertension in the Federal Teaching Hospital's medical outpatient clinics had chronic kidney disease (36). According to a cross-sectional study, 88.3% of patients with uncontrolled hypertension in Tanzania had chronic kidney disease (9).

In 2019, 26% of patients had chronic kidney disease, according to a cross-sectional study titled Patient Awareness, Prevalence, and Risk Factors of Chronic Kidney Disease among Diabetes Mellitus and Hypertensive Patients that was carried out in a hospital at Jimma University Medical Center in Ethiopia (25). According to a 2022 institution-based cross-sectional study at Ambo University Referral and General Hospital, chronic kidney disease was present in 20.5% of hypertensive patients (29).

2.3. Factors associated with chronic kidney disease

2.3.1. Socio-demographic factors

The prevalence of chronic kidney diseases was 8.69% among patients with both hypertension and diabetes mellitus, 3.36% among patients with only hypertension, and 5.22% among patients with only diabetes, according to a 2016 study conducted in North West China on the prevalence and associated factors of kidney dysfunction in patients with hypertension and/or diabetes mellitus from a primary care population in Northwest China. CKD was linked to older age and female sex, according to a cross-sectional study conducted in the general population of three northern Senegal regions using a two-level cluster sampling method and multivariate analysis (14).

Compared to men, chronic kidney disease was more common in women. In 2019, a study on the prevalence of chronic kidney disease in people with pre- or undiagnosed hypertension in the United States of America found that, after controlling for age, gender, and race using multivariable logistic regression, the prevalence of chronic kidney disease among people with pre- and undiagnosed hypertension was 17.3% and 22.0%, respectively, compared to 27.5% with diagnosed hypertension. According to a cross-sectional study of sociodemographic data at St. Paul's Hospital Millennium Medical College, age—particularly being over or equal to 60 years old—was substantially linked to chronic kidney disease (37).

2.3.2. Clinical characteristics related to factors

In individuals with diabetes and/or hypertension, triglycerides, anemia, fasting plasma glucose, and the length of time they had either condition were modifiable factors that were independently linked to chronic kidney disease. In Northwest China, individuals with diabetes mellitus and/or hypertension frequently have chronic renal disease. Patients at high risk should receive more care, particularly those who also have diabetes mellitus and hypertension (38). Patients with stage three hypertension are significantly associated with chronic kidney disease (OR=3.52, 95% CI 1.32 to 9.42, p=0.012 (9).

A 2020 institution-based cross-sectional study titled Prevalence and Associated Factors of Chronic Kidney Disease among Adult Hypertensive Patients at Northwest Amhara Referral Hospitals, Northwest Ethiopia, found that chronic kidney disease affected 17.6% of adult hypertensive patients. Chronic kidney disease was associated with adult hypertensive patients who had stage II hypertension, comorbidities, proteinuria, diastolic blood pressure ≥90 mmHg, and a history of hypertension ≥10 years (1).

A cross-sectional study on the prevalence and associated factors of chronic kidney disease was carried out in 2019 and found that 22.1% of adult hypertensive patients in Tigray teaching hospitals had chronic kidney disease. Among these independent factors, the most important risk factors for chronic kidney disease in hypertensive patients were age, uncontrolled hypertension, overweight/obesity, dyslipidemia, and diabetes mellitus. In conclusion, chronic kidney disease was widespread (7).

2.3.3. Lifestyle change-related factors

The progressive loss of kidney function is the hallmark of chronic kidney disease. The development and course of chronic kidney disease are significantly influenced by lifestyle factors. According to a cross-sectional study among hypertensive patients in Uganda, smoking is substantially linked to chronic kidney disease (36). According to a cross-sectional study, current smoking was substantially linked to chronic kidney disease in sub-Saharan patients with early-stage CKD who visited the medical outpatient department (MOPD) clinics of two tertiary hospitals in Dodoma between November 2020 and March 2021 (9). According to a different cross-sectional study done in Tanzania, people with hypertension who drink alcohol are more likely to develop chronic kidney disease than people who don't (35). In a cross-sectional study of patients in Uganda who were at least 18 years old, smoking was substantially linked to chronic kidney disease (10).

. CONCEPTUAL FRAMEWORK

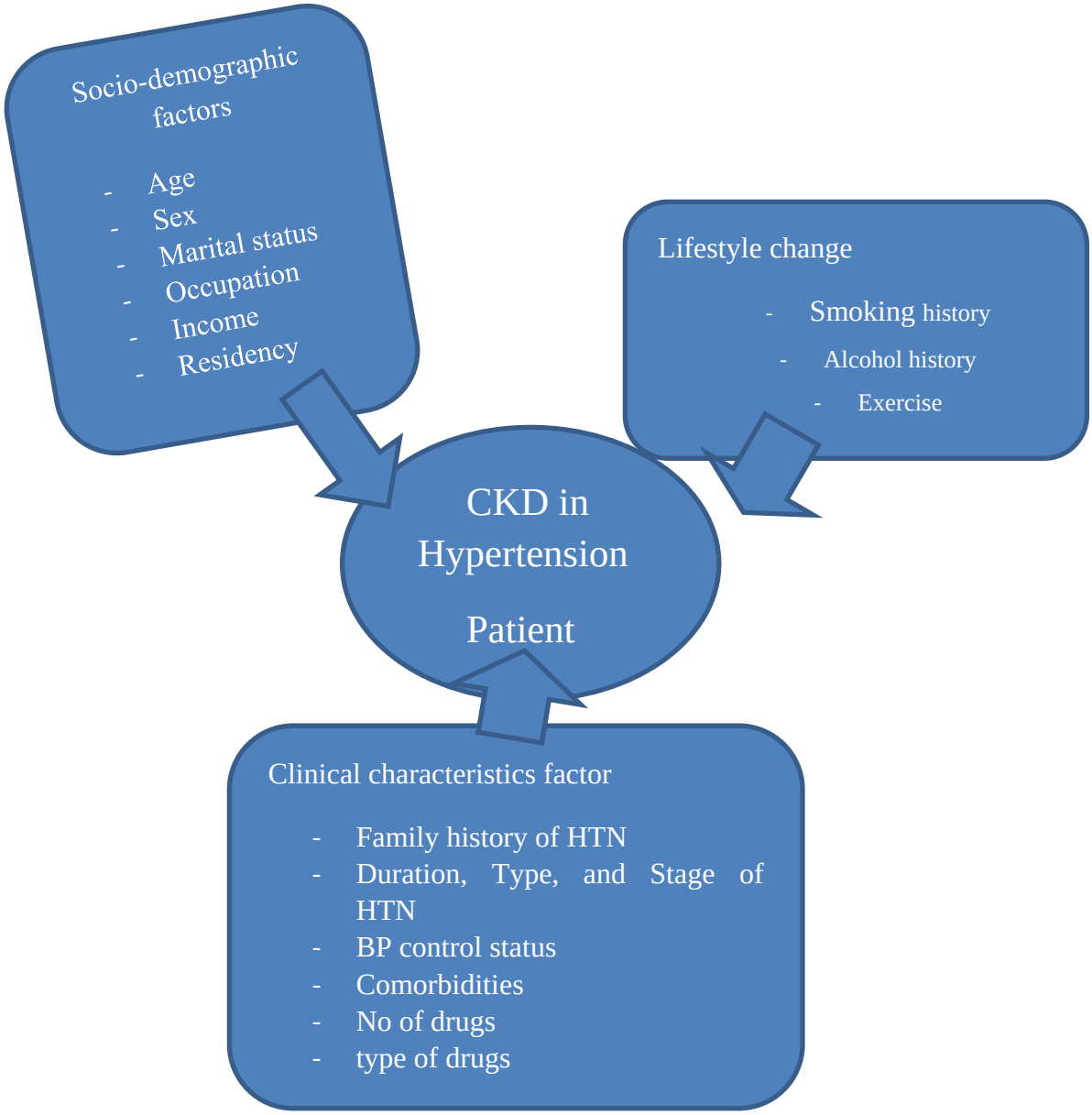

Figure 1: Conceptual framework to examine chronic kidney disorders and related variables in hypertensive patients in three public hospitals in Addis Ababa, Ethiopia [Source (17,24,27,28,39,40)].

3. OBJECTIVES

3.1. General objective

- ✓ To determine the prevalence of chronic kidney diseases and their contributing factors among hypertensive patients in a selected public hospitals in Addis Ababa, Ethiopia, in 2025

3.2. Specific objectives

- ✓ To outline the prevalence of chronic kidney diseases in hypertensive patients receiving follow-up care at the chosen public hospital in Addis Ababa, Ethiopia, in 2025
- ✓ Identifying risk factors for chronic kidney disease in hypertensive patients undergoing follow-up at the chosen public hospital in Addis Ababa, Ethiopia, 2025

4. METHODS AND MATERIALS

4.1. Study design and study period

An institution-based cross-sectional study was conducted among Hypertensive patients from December 21, 2024, to January 21, 20225

4.2 Study area

The study was conducted at a few public hospitals in Addis Ababa, Ethiopia. According to the Central Statistical Agency of Ethiopia's (CSA) 2007 Census, there are 338,456 people living in Addis Ababa. The elevation at which Addis Ababa is located is 7,546 feet (2,300 meters) (41). The city is approximately 530.14 km² in size. The city is home to a diverse range of highland climate zones (42). .

Black Lion Specialized Hospital. Prior to 1972, the School of Medicine was situated on the main campus. With the opening of the Black Lion Specialized Hospital (TASH) in 1972, it became the central location for training Medical Doctors. TASH is the largest referral hospital in the nation. The hospital acts as the main educational facility for most specialties, providing both clinical and preclinical training. TASH employs physicians, nurses, and various other healthcare professionals to deliver medical services. Patient care at the hospital is managed by numerous departments and faculties. Additionally, nearly all hospitals in both the Addis Ababa region and federal hospitals are associated with the school of medicine as sites for clinical services and training (43).

The Addis Ababa city administration's Kirkos Sub-city is home to ZMH Zewditu Memorial Hospital. Originally constructed by Swedish missionaries, the hospital was nationalized in roughly 1976 under the Derg regime. The Ministry of Health currently runs the Zewditu Hospital. Internal medicine, neurology, general surgery, ENT, psychiatry, ophthalmology, dentistry (maxillofacial surgery), radiology, dermatology, gynecology and obstetrics, pediatrics, and emergency medicine are among its various departments (44).

Although the hospital was founded in 1968 by the late Emperor Haile Selassie, and the medical school opened in 2007, St. Paul Millennium Medical College was created by a Council of Ministers decree in 2010. Patients who are referred from all over the nation receive medical

specialty services from the college's more than 5800 clinical, academic, and administrative employees. Patients with hypertensive OPD receive five weekly follow-ups. Monthly, on average, 1500 hypertensive patients came to SPHMMC OPD (45)

4.3. Source and study populations

4.3.1 Source population

All hypertensive patients who were at least eighteen years old and who had follow up in a selected public hospitals in Addis Ababa, Ethiopia.

4.3.2 Study population

All hypertensive patients aged 18 years and above who had follow-up in selected public hospitals in the Hypertension unit during the study period that fulfilled the inclusion criteria.

4.4. Exclusive and inclusive criteria

4.4.1. Inclusive criteria

- ✓ During the study period, all adult hypertensive patients who received follow-up treatment for their condition at specific public hospitals
- ✓ Patients who had followed up at least 6 months of duration and above
- ✓ A patient who was willing to participate in the study and who had a complete medical record

4.4.2. Exclusive criteria

- ✓ Women who were diagnosed with pregnancy-induced hypertension during pregnancy
- ✓ A patient who was unable to respond due to serious medical, psychiatric

4.5. Sample size determination and sampling procedure

The single proportion formula was used to determine the prevalence sample size:

The single population proportion formula for a single-proportion population was used to calculate the study's actual sample size.

$$n = \frac{(Z_{\alpha/2})^2 \times p(1-p)}{d^2}$$

Where n = Initial estimated sample size

Z = Confidence level (alpha, α)

P = prevalence

, d = marginal error

The following presumption was applied in order to calculate the sample size.

According to a prior related study carried out at the North West Amhara referral hospital in North West Ethiopia, the prevalence and associated factors of chronic kidney disease (CKD) among HTN patients were 17.6% (1).

$$Ni\ (1) = \frac{(1.96)^2 \times 0.176\ (1-0.176)}{(0.05)^2} = 223$$

When we added, 10% non-respondent rate, the final sample was 245

4.6. Sampling technique and procedure

A Simple random sampling method was used to select the study area from all public hospitals in Addis Ababa, and a systematic sampling method was used to select the sample from the Hypertensive patients who had follow-up in SPHMMC, TASH, and ZMH. Average annual appointment registration book, 1500, 1000, and 700 hypertensive patients were visited at the SPHMMC, TASH, and ZMH in the Hypertensive OPD unit in the period from December 21, 2024, to January 21, 2025. The sampling fraction (k) value was determined as N/n, which was 3200/245, which was 13.06 ~ 13. 13 patients were selected from the study. The study participants were chosen using a systematic random sampling technique after proportional allocation for each selected hospital. As a result, the diagram below depicts how study participants were chosen, with proportional allocation from each hospital.

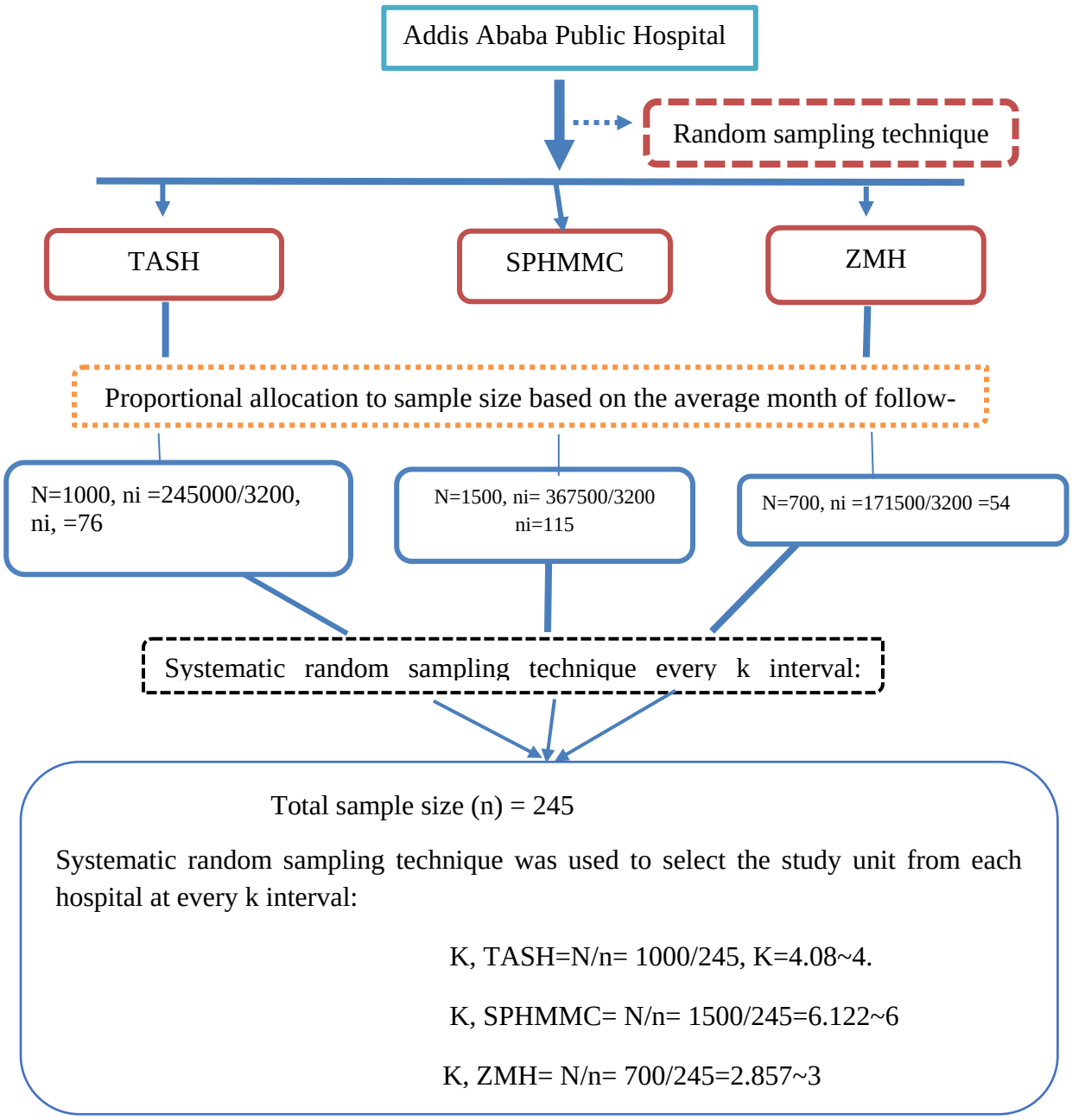

Figure 1: Schematic presentation of the sampling technique and procedure for the study on prevalence of CKD and associated factors among hypertensive patients in selected public hospitals, Addis Ababa, Ethiopia, 2025.

4.7. Operational definition

Chronic kidney disease: for these studies, consider patients having CKD if the diagnosed of patient having CKD and documented in the patient's medical chart, e-GFR. <60ml/min per 1.73m2 at least 3 months' duration and markers of kidney damage (46).

Alcohol use: determined by using yes or no (47).

Physical exercise: The patient says they perform regular daily physical activity for 30 minutes (48).

Controlled blood pressure: Adult hypertensive clients without diabetes mellitus and chronic kidney disease had blood pressure readings of less than 140/90 mm-Hg in the most recent follow-up record using a digital sphygmomanometer, while those with diabetes mellitus and chronic kidney disease had blood pressure readings of less than 130/80 mm-Hg (39).

BMI (body mass index): Body weight was defined as follows: underweight for patients weighing less than 18.5 kg/m2, normal weight for those weighing 18.5–24.9 kg/m2, overweight for those weighing 25–29.9 kg/m2, and obese for those weighing more than 30 kg/m2 (3). This was calculated by dividing the individual's weight in kilograms by his height in meters squared (3).

Proteinuria: Based on the laboratory results, we classify a patient as having proteinuria if their score is +1 or higher (46).

Hypertension: It was defined as people taking antihypertensive medications or those with a recorded diagnosis of hypertension (i.e., blood pressure ≥ 140/90 mmHg) (39).

Smoking: Smoking status was assessed by asking, "On how many of the past 7 days did you smoke a cigarette or cigar, even just one puff?" Respondents who reported 0 days were considered non-smokers. All others were categorized as smokers (27)

Comorbidity: patients with underlying chronic diseases like DM, HIV/AIDS, rather than HTN (49).

4.8. STUDY VARIABLES

4.8.1 Dependent Variable

- CKD in a hypertensive patient

4.8.2 Independent Variables

Socio-demographic: age, sex, educational status, occupation, income, marital status, residence

Clinical characteristics: Blood pressure status, baseline systolic and diastolic blood pressure, hypertension stage, kind, medication type, duration, quantity, comorbidity, dyslipidemia, proteinuria, and obesity.

Lifestyle characteristics: smoking, alcohol use, and exercise.

4.9. Data collection methods and data quality assurance

4.9.1 Data collection tool and procedure

Data was collected using a standardized procedure. Data was gathered through laboratory forms, medical chart reviews, and in-person interview questionnaires. This was created after carefully going over earlier pertinent research and it was changed after extensive literature reviews were used to gather information. There were three components to the questioner: Seven questions were included in the patient demographic variables. Clinical characteristics of the patient are covered in Part II (14 questions), and the patient's lifestyle is covered in Part III (3 questions). The principal investigator trained the BSC nurses (data collectors) for three days on the study instrument, data collection methods, and how to collect data from patients and their medical records. After that, information from the patient's medical records was gathered using a prepared extraction tool.

4.9.2. Data quality assurance

Prior to actual data collection, a pretest was conducted on 5% of the sample size for one week at Ras Desta Generalized Hospital to ensure the quality, appropriate validity, and reliability of the data collection tool. The questionnaire was examined for clarity, consistency, completeness, understandability, and simplicity. Quality was also maintained by the chronic clinic's use of qualified nurses. Before data collection, data collectors received training on the study's goal and how to use a data collection format. Over the course of the data collection period, the supervisor kept a close eye on the process. The investigator kept an eye on the process of gathering data.

Each tool's completeness was examined after completion, and any necessary corrections were made before the chart was made before the chart was returned.

4.10. Data processing and analysis

The consistency and completeness of the data were examined. Excel was used to enter the data, which was subsequently exported to SPSS version 27 for analysis. Tables and charts were used to display the results of descriptive statistics that were calculated to characterize the frequency, percentages, and distributions of the sample. Using a binary logistic regression analysis, odds ratios (OR) were employed to measure the degree of correlation between the dependent and independent variables. All variables associated with chronic kidney diseases that had a p-value of less than 0.25 in the bivariate logistic regression were examined using multivariable logistic regression analyses to control for potential confounding factors. A variable was associated with chronic kidney disease if its p-value was less than 0.05 indicated that a variable was linked to chronic kidney disease.

4.11. Ethical considerations

The institutional review board (IRB) of Addis Ababa University Medical College granted ethical clearance prior to data collection for this study, which was then submitted to the Addis Ababa Health Bureau, TASH, ZMH, and St PHMMC. Participants in the study were given a clear explanation of its purpose, and their right to decline was upheld. Each participant gave their informed verbal consent before any information was gathered. Confidentiality was guaranteed during the study period, and all personal information of study participants was kept completely anonymous. The questionnaire did not include the patient's name or address. Only the study's intended purpose was served by the data.

4.12. Dissemination of the result

The research paper will be finished and sent to the medical-surgical department of Addis Ababa University College of Health Sciences. The results of this study will be disseminated to Addis Ababa University, St. Paul's Hospital Millennium Medical College, Zewditu Memorized Hospital, and other organizations that have contributed to the project's execution. They will also be published in scientific journals and presented at various workshops, seminars, and meetings..

5. RESULTS

5.1 Socio-demographic characteristics of patients

With a 95.1% response rate, the study comprised 233 hypertensive patients from the outpatient departments of three public hospitals in Addis Ababa. 155 (66.5%) of the respondents were over 60, making up the majority of participants. The majority of participants were married (146, 62.7%), and 121 (51.9%) of the total were men. In terms of education, 181 (77.7%) lived in cities, and 86 (36.9%) had a college degree. Government employment was the most frequently reported occupation (56, 24%) (Table 1).

Table 1: Sociodemographic characteristics of chronic kidney diseases among hypertensive patients in a selected public hospital in Addis Ababa, Ethiopia, 2025.

Variable	Category	Frequency	Percent
Sex	Male	121	51.9
	Female	112	48.1
Age	> 60 years	155	66.5
	≥ 60 years	78	33.5
Mean Income level	Below the mean	141	60.5
	Above the mean	92	39.5
Marital status	Single	32	13.7
	Married	146	62.7
	Divorced	30	12.9
	Widowed	25	10.7
Educational status	Non-formal education	24	10.3
	Primary	48	20.6
	Secondary	75	32.2
	college and above	86	36.9
Occupation	Farmer	41	17.6
	House wife	32	14.1
	Merchant	43	18.5
	Government employed	56	24.0

	Private employee	43	18.5
	Other	18	7.7
Residency	Urban	181	77.7
	Rural	52	22.3

5.2. Clinical-related factors of chronic kidney disease among hypertensive patients

This study assessed various clinical factors among 233 hypertensive patients to identify patterns associated with the prevalence of chronic kidney disease (CKD). Among the participants, the systolic type of hypertension was most prevalent, accounting for 119 (52.4%), and A large majority, 202 (89.0%), had been diagnosed with hypertension for less than 10 years. Stage one hypertension was observed in 111 (48.9%) participants, and about 154 (67.8%) of the participants had controlled blood pressure. The majority of patients, 132 (58.1%), were taking two types of antihypertensive medications, while A total of 96 (42.3%) participants reported taking medications other than antihypertensive, which could include drugs for comorbidities like diabetes or dyslipidemia, possibly influencing kidney function. Most participants (161, 69.1%) had a normal BMI, while 28 (12%) were classified as obese, and elevated serum creatinine levels (≥1 mg/dL) were found in 68 (29.2%) participants, indicating potential renal impairment. A significant proportion, 87 (37.3%), had proteinuria, which is a hallmark sign of kidney damage and a predictor of CKD progression (Table 2).

Table 2: Clinical characteristics of chronic kidney diseases among hypertensive patients in a selected public hospital in Addis Ababa, Ethiopia, 2025.

Variable	**Category**	**Frequency**	Percent
Type of hypertension	Systolic	119	52.4
	Diastolic	12	5.3
	Mixed	96	42.3
Duration of hypertension	< 10 years	202	89.0
	≥10 years	25	11.0
Stage of hypertension	Stage one	111	48.9
	Stage two	58	25.6

	Stage three	58	25.6
Blood pressure control status	Controlled	154	67.8
	Uncontrolled	73	32.2
Number of drugs taken	One	41	18.1
	Two	132	58.1
	Three and above	54	23.8
Do you take any other drugs other than an anti-hypertensive drug	Yes	96	42.3
	No	132	57.7
Do you have a family history of hypertension	Yes	62	27.3
	No	165	72.7
Body mass index	Under weight	19	8.2
	Normal weight	161	69.1
	Over weight	25	10.7
	Obesity	28	12
Do you have any comorbidities other than hypertension	Yes	161	69.1
	No	72	30.9
If you say yes, please specify	Diabetes	78	33.5
	Dyslipidemia	81	34.8
	Heart diseases	25	10.7
	Chronic lung disease	31	13.3
	Others	18	7.7
Creatinine level	<1	165	70.8
	≥1	68	29.2
Body swelling	Yes	44	18.9
	No	189	81.1
Proteinuria	Yes	87	37.3
	No	146	62.7

5.3. Prevalence of chronic kidney disease among hypertensive patients

Among 233 hypertensive patients included in the study, 22.3% were found to have chronic kidney disease (CKD). The 95% confidence interval (CI) for the prevalence was 17.1% to 28.2% (Figure 2).

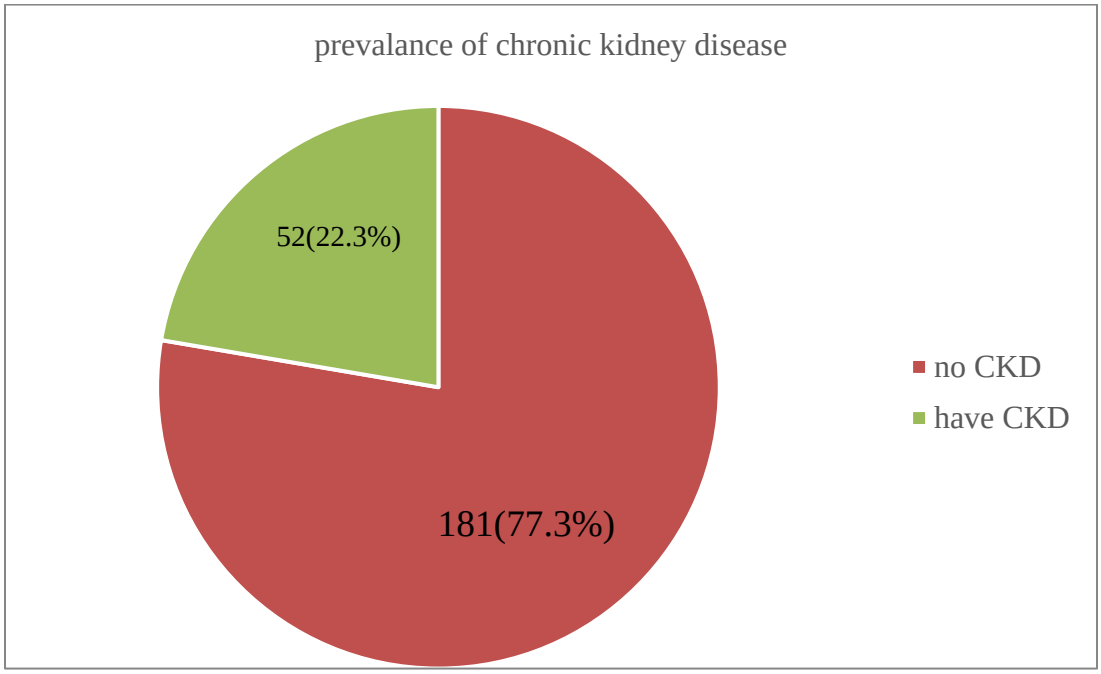

Figure 3: Prevalence of chronic kidney diseases among hypertensive patients in a selected public hospital in Addis Ababa, Ethiopia, 2025.

5.4 Lifestyle characteristics of hypertensive patients

The study also evaluated lifestyle behaviors that may contribute to the risk or progression of chronic kidney disease (CKD) among hypertensive patients. Out of 233 respondents, 32 (13.7%) reported a history of smoking, and a total of 60 (25.8%) participants reported alcohol consumption. About 162 (69.5%) had sedentary lifestyles (Table 3).

Table 3: lifestyle change-related factors among chronic kidney disease among hypertensive patients in a selected public hospital in Addis Ababa, Ethiopia, 2025.

Variable	Category	Frequency	Percent
Smoking	Yes	32	13.7
	No	201	86.3
Alcohol	Yes	60	25.8
	No	173	24.2
Exercise	Yes	71	30.5
	No	162	69.5

5.5. Factors associated with chronic kidney diseases among hypertensive patients in a selected public hospital in Addis Ababa, Ethiopia, 2025.

In the bivariate analysis factors including residency, duration of hypertension, stage of hypertension, body mass index and drug taking other than anti-hypertensive drug were factors associated with chronic kidney disease among hypertensive which satisfy preliminary assumptions to be further examined in multivariable analysis to control for potential confounding factors (P<0.25 in bivariate logistic regression).

During the multivariate analysis residence, body mass index and the length of hypertension were factors that were substantially linked to chronic renal disease (p-value <0.05). Those who lived in rural areas had an 11.50-fold higher chance of developing chronic kidney disease (CKD) than those who lived in urban areas (AOR = 11.50, 95% CI: 3.24-40.77). Compared to those who had hypertension for less than ten years, those who had it for more over ten years had a higher chance of developing chronic kidney disease (CKD) (AOR=16.14, 95% CI: 4.40-59.21). It was 7.25 (AOR=7.25, 95% CI: 1.60-32.86) times more common for individuals with stage 3 hypertension than for those with stage I hypertension.

Table 4: Multivariable logistic regression of factors associated with chronic kidney diseases among hypertensive patients in selected public hospitals in Addis Ababa, Ethiopia, 2025.

Variables	Category	CKD		COR(95% CI)	AOR(95% CI)	P value
		Yes	No			
Residence	Urban	162	19	1.0	1.0	
	Rural	19	33	14.80(7.08-30.97)	11.50(3.24-40.77)	**0.001***
Duration of hypertension	< 10 years	162	19	1.0	1.0	
	≥ 10 years	17	35	17.55(8.30-37.14)	16.14(4.40-59.21)	**0.001***
Stage of hypertension	Stage one	107	6	1.0	1.0	
	Stage two	11	49	4.00(1.40-11.45)	1.51(0.35-6.54)	0.581
	Stage three	25	35	24.96(9.47-65.82)	7.25(1.60-32.86)	**0.010***
Do you take any other drugs other than For anti-hypertension?	Yes	31	68	2.45(1.31-4.61)	1.23(0.41-3.69)	0.716
	No	23	113	1.0	1.0	
Body mass index	Under weight	14	149	1.0	1.0	
	Normal weight	5	12	0.22(0.07-0.73)	0.05(0.01-0.29)	0.001
	Over weight	15	10	4.20(1.15-15.37)	0.66(0.09-4.76)	4.758
	Obesity	20	8	7.00(1.89-25.93)	1.32(0.22-7.93)	0.763

NB: COR: crude odd ratio, AOR: adjacent odd ratio, CI: confidence interval,*P: ≤ .05 variables significantly associated with CKD

6. DISCUSSION

This study assessed the prevalence of chronic kidney disease (CKD) among adult hypertension patients who visit chronic illness follow-up clinics at specific public hospitals, as well as the factors that are significantly associated with CKD in this population. According to a recent study, CKD was present in 22.3% (95%) of adult patients with hypertension. This result was in line with studies conducted in Ethiopia (21%; 37); Japan (20.6%; 35); and Ambo Referral Hospital (20.5%).

In the current study, the prevalence of CKD among adult hypertensive patients was 22.3% (95%. This result was in line with the studies conducted in Japan, 20.6% (34), in Ethiopia, 21% (35), and at Ambo Referral hospital20.5% (29). This could be due to similarity in Study Population: the populations involved in all these studies primarily included adults with hypertension, a major risk factor for CKD. The similarities in demographic profiles, such as age range and comorbidity patterns, may contribute to comparable CKD prevalence. For instance, in the Japanese study35), the participants were middle-aged to elderly hypertensive individuals. Environmental and Lifestyle Factors: The Ethiopian studies, including the one conducted at Ambo Referral Hospital (29) and the national-level study (35), share common environmental and dietary conditions with the current study's setting. These include limited access to early screening, low public awareness of CKD, and high salt intake, all of which can contribute to similar rates of CKD among hypertensive patients.

However, the finding of this study was higher than the findings of studies conducted in the United States of America, 9.5% in (32), in China, 15.3% (33), in Uganda17.2%(10), and in Senegal, 17.8% (14). This might be due to differences in Study Population Characteristics: The lower prevalence in the U.S. study (32) may be due to a broader inclusion of hypertensive patients under regular care, including those with better-controlled blood pressure and comorbidities. In contrast, patients in the current study might have presented with more advanced or uncontrolled hypertension, a key contributor to CKD progression. Study Setting and Health System Differences: The healthcare systems in high-income countries such as the U.S. and China typically offer better access to early screening, diagnostic tools, and continuous care for hypertensive patients. For instance, the Chinese study (33) was conducted in urban tertiary hospitals where early detection and disease management are routine, contributing to a lower

CKD burden. Conversely, in resource-limited settings like those in Ethiopia, delayed diagnosis and poor follow-up can increase CKD prevalence. Lack of Awareness and Health-Seeking Behavior: The higher prevalence in the current study may also reflect lower public awareness and limited knowledge about CKD and its risk factors. This is especially true in rural or semi-urban Ethiopian settings, where health education and preventive practices are limited. In contrast, public health campaigns in countries like Senegal (14) and Uganda (10) might have contributed to better awareness and earlier detection, resulting in relatively lower prevalence rates.

This result was lower than studies conducted in Sierra Leone, 29.9% (30), in Nigeria, 50% (36), in Tanzania, 88.3% (9), and in Jimma Hospital, 26% (25). Significant regional variations in socioeconomic traits, lifestyles, managing and monitoring chronic illnesses, climate, healthcare, and economic development may be the cause of the variations in the prevalence of chronic kidney disease (CKD) among patients with chronic illnesses.

This study identified three main factors significantly associated with CKD among hypertensive patients: residency, duration of hypertension, and stage of hypertension. Patients residing in rural areas had a significantly higher risk of developing CKD compared to their urban counterparts (AOR = 11.50, 95% CI: 3.24–40.77). This may be due to limited access to healthcare services, lack of health education, and poor screening practices in rural areas. Rural areas often lack nearby hospitals, clinics, or specialist centers. Patients may need to travel long distances to receive care, which can delay diagnosis and management of hypertension and CKD. Many rural facilities lack proper equipment for blood pressure monitoring, kidney function testing (e.g., serum creatinine, eGFR), or urine analysis. As a result, CKD is often diagnosed at later stages.

Individuals with a history of more than 10 years were found to be 16.14 times more likely to develop CKD (AOR = 16.14, 95% CI: 4.40–59.21). Prolonged hypertension leads to cumulative damage to renal blood vessels and nephrons, accelerating glomerular filtration rate (GFR) decline. Long-term exposure to antihypertensive medications may also contribute to nephrotoxicity if not properly monitored. This finding aligns with previous research conducted in Ethiopia, which emphasized the progressive impact of long-standing hypertension on kidney function (1).

Patients with stage three hypertension were 7.25 times more likely to develop CKD (AOR = 7.25, 95% CI: 1.60–32.86). Advanced hypertension exerts sustained pressure on renal vasculature, causing structural damage and reducing kidney function over time. This is in agreement with studies from Tanzania and other regions where severe hypertension has been closely linked to CKD development(9).

Strength

This study has certain advantages and disadvantages. Increases understanding of the current prevalence of chronic kidney disease (CKD) in Ethiopian patients with chronic illnesses. The purpose of sub-group analysis was to reduce statistical heterogeneity. To determine the significant factors for CKD, a number of factors were also included.

Limitation

The cross-sectional nature of the study precludes the demonstration of a causal relationship between independent variables and CKD. The diagnosis of CKD was made using the records that were already in existence, which might have had different diagnostic standards or lacked standardized kidney function tests like eGFR or albuminuria.

7. CONCLUSION

With a prevalence of 22.3%, this study found that hypertensive patients in a few public hospitals in Addis Ababa, Ethiopia, had a considerable burden of chronic kidney disease. The results emphasize how crucial it is for hypertensive people, particularly those with other clinical risk factors, to undergo routine screening for CKD. The prevalence of chronic kidney disease in hypertensive patients is influenced by a number of factors, including residency, particularly for patients in rural areas, the stage of hypertension, and the length of time the patient has had hypertension (greater than 10 years).

8. RECOMMENDATION

❖ **For the Ministry of Health, Ethiopia**

➢ Develop a national guideline mandating annual renal function tests (serum creatinine, eGFR, and urine protein) for all hypertensive patients across primary and secondary care settings.

❖ **For Public Hospitals**

➢ Strengthen routine CKD screening protocols for hypertensive patients during follow-up visits, especially for those aged >40 years or with long-standing hypertension.

➢ Train clinicians and nurses on early identification of CKD symptoms and interpretation of renal function test results.

➢ Run monthly health education sessions in waiting areas, focusing on kidney health and lifestyle practices for hypertensive patients.

❖ **For Future Researchers**

➢ Conduct prospective cohort studies to identify causal relationships and progression timelines of CKD among hypertensive populations in Ethiopia.

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10. APPENDIX

APPENDIX: INFORMATION SHEET AND INFORMED CONSENT

Dear respondent:

Hello, my name is N/r Mitiku Minksew. Today I am here to collect data to assess the prevalence of CKD and its associated factors among hypertensive adult patients attending the Hypertensive OPD clinic of St PHMMC, TASH, and ZMH. I am asking you for a few minutes of your time to

participate in this study. The information I interviewed and you gave will be very useful in the realization of this study, and it will be kept confidential. The Name and Address of the participant will not be recorded. You have the right not to answer any questions that might be inconvenient for you. However, your information is very important for the study. And we would like to confirm to you that all your data is confidential and used for research purposes only.

Are you willing to participate in this study?

Sign----------

Thank you for spending your precious and valuable time.

APPENDIX 2: QUESTIONNAIRE TOOL

Good morning/afternoon? I am a healthcare professional. I need to collect data regarding the Prevalence of CKD and its associated factors among hypertensive adult patients attending the hypertensive OPD of St PHMMC, TASH, and ZMH, using an interview-based structured questionnaire, and will be collected by the principal investigator. It will take 15 to 20 minutes. Your honest response is very important to produce quality data in the organization, thereby planning appropriate measures that could be taken.

Thank you for your participation.

Section 1. Socio demographic		
1.1.	Age	In number
1.2	Sex	a. Male b. Female
1.3.	Marital status	a. Single b. Married c. Divorced d. Widow
1.4.	Residency	a. Urban b. Rural
1.5.	Occupation	a) Government employed b) Self employed c) Unemployed d) Farmer e) House wife
1.6.	Income	In number
1.7	Level of education	a) non-formal education b) primary c) secondary d) college and above
2. **Clinical Characteristics**		
2.1.	Types of HTN	Systolic Mixed

2.2.	Duration of HTN	…in a month….
2.3.	Stage of HTN	a. Stage 1 b. Stage 2 c. Stage 3
2.4.	BP control status	a. Controlled d. Uncontrolled
2.5.	No of HTN drugs taken	a. 1 b. 2 c. above 2
2.6.	Do you take any other drugs other than for anti-hypertension?	a. Yes b. No
2.7.	Do you have a family history of Hypertension?	a. Yes b. No
2.8.	BMI	
2.9.	Do you have comorbidities other than Hypertension?	a. Yes b. No
2.10.	If yes for question 2.7. Which one is it?	a. DM b. Dyslipidemia c. Heart disease d. Chronic lung disease e. Other
2.11.	Serum creatinine mg/dl	A B
2.12.	Body swelling	A, yes B, no
2.13.	Proteinuria	A, yes, B, no

2.14.	Chronic kidney disease	a. Yes b. No
Section 3. Lifestyle change		
3.1.	**Smoking**	a. Yes b. No
3.2.	Alcohol	a. Yes b. No
3.3.	Exercise	a. Yes b. No

Annex 3 Amharic version questionnaires (የአማረኛ መጠይቆች) መግቢያ እና የስምምነት ፊርማ

አባሪ፡ የመረጃ ሉህ እና በመረጃ የተደገፈ ስምምነት

ውድ ምላሽ ሰጪ፡-

ሰላም ን/ር ምትኩ ምንቅሰው እባላለሁ። ዛሬ የ ኩላሊት ስርጭትን እና ተያያዥ ምክንያቶችን በ ቅዱስ ጳውሎስ፣ ጥቁር አንበሳ እና ዘዉዲቱ ሆስፒታል ሃይፐርቴንሲቭ ኦፒዲ ክሊኒክ ውስጥ በሚከታተሉ ጎልማሳ ታካሚዎች መካከል ያለውን ስርጭት ለመገምገም እዚህ መጥቻለሁ። በዚህ ጥናት ላይ ለመሳተፍ ጥቂት ደቂቃዎችን እጠይቃችኋለሁ። ቃለ መጠይቅ ያደረግኩት እና እርስዎ የሰጡት መረጃ ለዚህ ጥናት ተግባራዊነት በጣም ጠቃሚ ይሆናል እናም በሚስጥር ይጠበቃል። የተሳታፊው ስም እና አድራሻ አይመዘገብም። ለእርስዎ የማይመቹ ጥያቄዎችን ላለመመለስ መብት አለዎት። ሆኖም፣ የእርስዎ መረጃ ለጥናቱ በጣም አስፈላጊ ነው። እና ሁሉም ውሂብዎ ሚስጥራዊ እና ለምርምር ዓላማዎች ብቻ ጥቅም ላይ የሚውል መሆኑን ልናረጋግጥልዎ እንወዳለን።

በዚህ ጥናት ለመሳተፍ ፈቃደኛ ነህ?

ይፈርሙ ----------

ውድ እና ጠቃሚ ጊዜዎን ስላሳለፉ እናመሰግናለን።

አባሪ 2፡ የጥያቄ መሳሪያ

ሰላም? እኔ የጤና እንክብካቤ ባለሙያ ነኝ።ምክንያቶችን በ ቅዱስ ጳውሎስ፣ ጥቁር አንበሳ እና ዘዉዲቱ ሆስፒታል የደም ግፊት ላለባቸው ጎልማሶች ታካሚዎች የ ኩላሊት ስርጭትን እና ተያያዥ ምክንያቶችን በቃለ መጠይቅ ላይ የተመሰረተ የተዋቀረ መጠይቅን በመጠቀም መረጃ መሰብሰብ አለብኝ እና በዋና መርማሪው ይሰበሰባል። ከ 15 እስከ 20 ደቂቃዎች ይወስዳል. የአንተ ታማኝ ምላሽ በድርጅቱ ውስጥ ጥራት ያለው መረጃ ለማምረት በጣም አስፈላጊ ነው, በዚህም ሊወሰዱ የሚችሉ ተገቢ እርምጃዎችን ማቀድ.

ለተሳትፎዎ እናመሰግናለን።

ክፍል-1 ግላዊ መረጃ የሚጠይቁ መጠይቆች		
1.1.	ዕድሜ	(በዓመት)
1.2	ፆታ	ነ) ወንድ 2)ሴት
1.3.	የትዳር ሁኔታ	ነ) ያላገባ/ያላገባች 2) ያገባ/ያገባች 3) ተሰናበተ 4) ባል/ሚስት አለፈ
1.4.	መኖሪያ ቦታ	ነ) ከተማ 2) ገጠር
1.5.	ስራ	ነ) የመንግስት ሰራተኛ 2) ራስ በመንቀሳቀስ ሰራተኛ 3) ሥራ የለም 4) ገበሬ 5) ቤተሰብ አስተዳዳሪ
1.6	ወርሃዊ ገቢ	(በብር)

1.7	የትምህርት ደረጃ	ነ) ትምህርት ያልተቀበሉ 2) መጀመሪያ ደረጃ 3) ሁለተኛ ደረጃ 4) ኮሌጅ እና ከዚያ በላይ
ክፍል 2፡ ክሊኒካል ሁኔታ		
2.1.	የደም ግፊት አይነት	ነ) ሲስቶሊክ 2) ድያስቶሊክ 3) የተዋሃደ
2.2.	የደም ግፊት የኖረው ጊዜ	በወራት
2.3.	የደም ግፊት ደረጃ	1) ደረጃ 1 2) ደረጃ 2 3) ደረጃ 3
2.4.	የደም ግፊት ሁኔታ	ነ) ተቆጣጠረ 2) አልተቆጣጠረም
2.5.	የሚወስዱት ደም ግፊት መድሃኒቶች	1) 1 2) 2 3) ከ2 በላይ
2.6.	6 ከደም ግፊት መድሃኒቶች በተጨማሪ ሌሎች መድሃኒቶች ትወስዳለህ/ሽ?	1) አዎ 2) አይ
2.7.	በቤተሰብ ውስጥ የደም ግፊት አለ?	1) አዎ 2) አይ
2.8.	የሰውነት ብዛት መረጃ ጠቋሚ	----------
2.9.	ከደም ግፊት በተጨማሪ ሌላ በሽታ አለ?	1) አዎ 2) አይ
2.10.	አለ ከሆነ፣ የምንም አይነት ነው?	ነ) የስኳር በሽታ 2) ዲስሊፕዊድሚያ 3) የልብ ችግር 4) ዘላቂ የሳንባ ችግር 5) ሌላ

2.11.	የደም ኪሪያቲኒን (mg/dL):	----------
2.12.	የሰውነት ማበጥ	ነ) አዎ 2) አይ
2.13.	ፕሮቲኑሪያ	1) አዎ 2) አይ
2.14.	የኩላሊት በሽታ አለ?	1) አዎ 2) አይ
ክፍል 3. የአኗኗር ሁኔታ		
3.1.	**ታጨሰለህ/ሽ?**	1) አዎ 2) አይ
3.2.	መጠጥ ትጠጣለህ/ሽ?	1) አዎ 2) አይ
3.3.	የአካል እንቅስቃሴ ታደርጋለህ/ሽ?	1) አዎ 2) አይ

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