
Prevalence of Chronic Kidney Disease in Lafia, North Central Nigeria

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Abstract

Background: Chronic kidney disease (CKD) is a growing global public health problem associated with increased morbidity, mortality, and health-care costs. The burden of CKD is disproportionately higher in low- and middle-income countries, where access to early detection and renal care is often limited. In Nigeria, population-based data on CKD prevalence remain scarce, particularly in North Central regions such as Lafia. This study aimed to determine the prevalence of CKD and describe selected demographic and health-care access characteristics among adults in Lafia, Nigeria.

Methods: This cross-sectional study enrolled 190 participants aged 18 years and above. Serum creatinine was measured using Jaffe's method, and estimated glomerular filtration rate (eGFR) was calculated using the 2021 Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation. CKD was defined as an eGFR <60 mL/min/1.73 m².

Results: The overall prevalence of CKD in the study population was 13.7%. Participants with CKD had a mean age of 39.4±3.1 years. The prevalence of CKD was higher in females compared with males. Only 61.6% of participants reported having access to a health-care facility.

Conclusions: This study demonstrates a relatively high prevalence of CKD (13.7%) among adults in Lafia, North Central Nigeria, with a notable burden observed in younger individuals. Limited access to health-care services may further exacerbate underdiagnosis and late presentation. These findings highlight the urgent need for community-based screening programs and improved access to healthcare services.

Keywords: renal failure; incidence; kidney failure; ESKD; ESRD

Introduction

Chronic kidney disease (CKD) is defined as an estimated Glomerular Filtration Rate (eGFR) less than 60 mL/min/1.73 m², persisting for three months or more, irrespective of the cause¹. CKD is a gradually worsening condition. It can be difficult to detect early because symptoms typically do not appear until the later stages of the disease.²

CKD represents a significant public health concern globally, with its prevalence on the rise in many parts of the world, including Nigeria. CKD affects an estimated 8 -16% of the adult population worldwide.³ While there is no nationwide survey of the prevalence of CKD in Nigeria, reports from different community-based studies report prevalence ranges between 2.5% and 26% using

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different diagnostic criteria.⁴ Nasarawa State, located in North Central Nigeria, lacks data on the prevalence of CKD within its population. Understanding the epidemiology of CKD in Nasarawa State is crucial for informing public health interventions and healthcare policy development aimed at prevention, early detection, and management of the disease. This study aimed to determine the prevalence of CKD among adult residents of Lafia.

Materials and Methods

Study participants

The study was conducted in three communities (Gandu, Akunza, and Millionaire Quarter) in Lafia, Nasarawa State. One hundred and ninety participants were enrolled in this cross-sectional study. Adults aged 18 years and above residing in Lafia who gave consent were included in the study. Young individuals under 18 years of age and pregnant women were excluded.

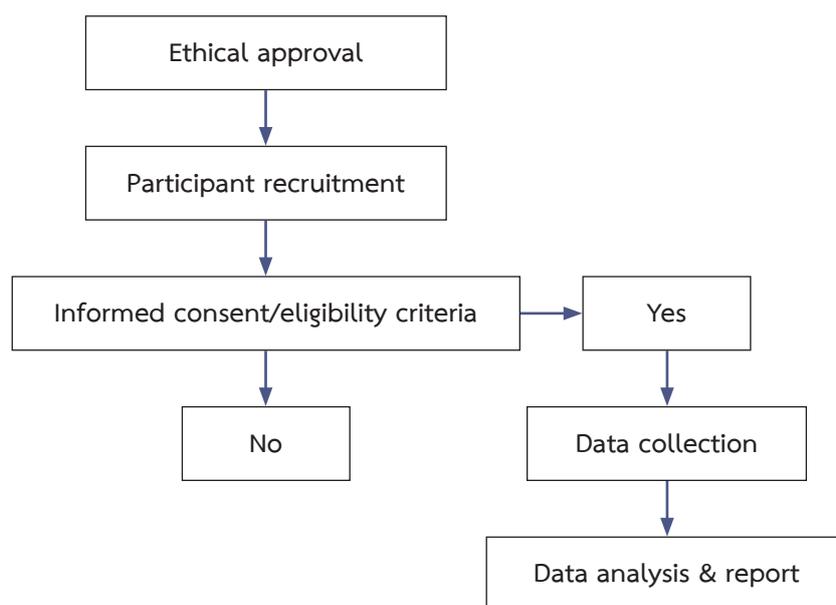


Figure 1 Study flow diagram

Ethical consideration

Ethical approval was obtained from the Federal University of Lafia Faculty of Basic Medical Sciences Research and Ethics Committee with reference number BM-A1-0016. Approval was sought from community leaders, and all participants provided written informed consent before enrolment in the study. All information pertaining to participants is confidential, and participation in the study was voluntary.

Data collection

A Proforma was prepared in two sections; the first section is on socio-demographic data, and the last section is on physical examination, and the result of the serum creatinine and eGFR was used to collect data. Venous blood samples were collected from participants, and

serum creatinine levels were measured using the Jaffe method. The Chronic Kidney Disease Epidemiology Collaboration Equation (CKD-EPI 2021) was used to calculate the estimated Glomerular Filtration Rate (eGFR), and an eGFR of less than 60 mL/min/1.73 m² was considered indicative of CKD.

Statistical analysis

The collected data were analysed using the Statistical Package for the Social Sciences (SPSS) version 29.0. Categorical data collected, such as sex, ethnicity, level of education, etc., were presented in frequency and percentages, while numerical data, such as age, serum creatinine level, and eGFR, were presented as mean ± standard deviation.

Results

The socio-demographic characteristics and renal function of the participants are presented in **Table 1**. The mean age was 38.92 ± 16.46 years. Females, accounting for 64.2% of the participants, formed the majority. The Eggon tribe (37.4%) was the largest ethnic group. Less than half of the study population has primary or no formal education. Seventy percent of participants are low-income earners. The majority neither smoke nor consume alcoholic beverages (90.0% & 93.2% respectively). Only 61.6% of participants have access to health care facilities. The mean eGFR was 107.11 ± 34.52 mL/min/1.73 m².

Table 1 Socio-demographic characteristics of the participants

Variables	N=190
Age (years)	38.92±16.46
Sex (n/%)	
Female	122 (64.2)
Male	68 (35.8)
Ethnicity (n/%)	
Eggon	71 (37.4)
Kanuri	25 (13.2)
Hausa Fulani	31 (16.3)
Rendre	15 (7.8)
Others	48 (25.3)
Level of Education (n/%)	
None	51 (26.8)
Primary	40 (21.1)
Secondary	34 (17.9)
Tertiary	24 (12.6)
Informal	41(21.6)
Income Level (n/%)	
Low	133 (70.0)
Middle	46 (24.2)
High	11 (5.8)
Smoking (n/%)	
No	171 (90.0)
1-3 times a week	5 (2.7)
Daily	14 (7.3)
Alcohol intake (n/%)	
No	177 (93.2)
1-3 times a week	2 (1.0)
Daily	11 (5.8)
Access to a health care facility (n/%)	
Yes	117 (61.6)
No	73 (38.4)
Serum Creatinine (µmol/L)	69.02±42.74
eGFR (mL/min/1.73 m ²)	107.11±34.52

Prevalence and characteristics of CKD

Out of the 190 participants, 26 (13.7%) had eGFR < 60 mL/min/1.73 m². The mean age of the participants with CKD was 39.4 ± 3.1 years; females accounted for 76.9% (n = 20), while males accounted for 23.1% (n = 6). Those with access to healthcare accounted for 42.3%, and those without access accounted for 57.7%. The pie chart (**Figure 2**) represents the distribution of CKD stages. There were 13 (50%) participants with stage 3a (eGFR 45 – 59 mL/min/1.73 m²), 8 (31%) participants with stage 3b (eGFR 30 – 44 mL/min/1.73 m²), 5 (19%) participants with stage 4 (eGFR 15 - 29 mL/min/1.73 m²), and none with stage 5.

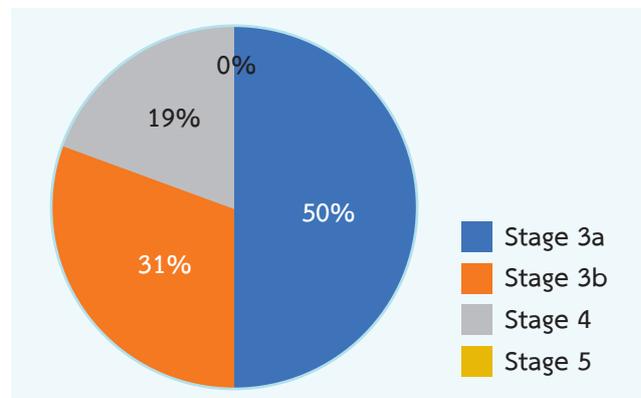


Figure 2 Distribution of chronic kidney disease stages

Discussion

The prevalence of CKD (13.7%) in this study is similar to the 12% reported from another part of North Central Nigeria.⁵ A systematic review done in 2018, pooling seven population-based studies, revealed that the prevalence of CKD ranges between 2.5-26% in Nigeria⁴. The CKD prevalence in Lafia is higher than the 7.2% prevalence in Ecuador, a country located in Northwestern South America.² In this study, the prevalence of CKD is significantly higher in females than in males. Although this may be explained by the fact that there are more female than male participants in this study, a similar pattern of higher female prevalence is also seen in a previous study in Kwara State, where CKD prevalence is higher in females (14.1%) than males (9.5%).⁵ A systematic review of various studies done in Nigeria showed a higher prevalence in females than in males.⁴ This is similar to

reports from other parts of the world.⁶ It is not exactly clear why there are more females than males with CKD; it may be attributed to the fact that females tend to have a higher health care utilization due to pregnancy, childbirth, and contraception. Thus, increasing the tendency for diagnosis. Although more females are diagnosed with CKD, males tend to progress faster to end-stage kidney disease, as suggested by the fact that more men are seen at dialysis and transplant centers.⁷

The study population is predominantly low-income and has limited access to healthcare facilities. This may have impacted their access to quality healthcare with attendant increase in the prevalence of the disease. About half of those with CKD are in stage 3a, and none of them were found with end-stage kidney disease (stage 5). This may be explained by the fact that CKD is mostly asymptomatic until renal functions decline severely to end-stage. Also, since this is a community-based study, participation by community members living with end-stage disease is likely to be limited by the nature of their illness, which may impair their ability to reach the research venues.

This study is limited by the fact that a single serum creatinine measurement was used to estimate eGFR, which may have led to an overestimation of the study findings

In conclusion, this study demonstrates a relatively high prevalence of CKD among adults in Lafia, North Central Nigeria, with a notable burden observed in young individuals. Limited access to health-care services may further exacerbate underdiagnosis and late presentation. These findings underscore the pressing need for community-based screening programs and enhanced access to healthcare services.

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