

# Prevalence and Indices of Chronic Kidney Disease Among Ebira in Irasa Community of Ado-Ekiti

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## Abstract:

The study was conducted to find out the prevalence and indices of chronic kidney disease among Ebira in Irasa community, Ado-Ekiti. A quantitative research, which employed cross-sectional descriptive design was used in this study. The study population was both men and women in the Ebira community at Irasa, Ado – Ekiti. A sample size of two hundred and twenty (220) participants was selected in the community using purposive and convenience sampling technique. The instrument for this study was questionnaire comprising of 3 sections A, B and C. The instrument for data collection was validated by experts in Nursing Science who ensured the face and content validity. Data collected was analyzed using descriptive and inferential statistics. Chi-square was employed to determine the relationship between the variables at 0.05 level of significance. The study revealed that the prevalence level among respondents showed that 27 (12.3%) were abnormal as against 193 (87.7%) that is normal when measured against kidney damage and GFR of 90ml/min/1.73 m<sup>2</sup> using Cockcroft- Gault Formular and the presence of 2++ of protein in the urine. It was also revealed that hematuria and proteinuria were identified as indices of CKD while swollen feet were not an index among the studied population in Irasa community. It was recommended among others that

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Community Health workers sent to the rural places should be adequately trained in the field of nephrology to enhance their cognitive power in identifying indices of chronic kidney disease thereby reducing the incidence of kidney diseases and reduce the cost of care.

**Keywords:** Prevalence, Indices Chronic Kidney Disease,

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## Introduction

According to epidemiological studies, chronic kidney disease (CKD) has become a common and prevalent disease in the general population. It also has been found that CKD is a risk factor for many diseases, such as cardiovascular diseases, anaemia, electrolyte abnormalities, bone diseases, cognitive and psychological disorders (Elias et al., 2017). Given its high prevalence and association with adverse outcomes which sometimes leads to kidney failure, and other complications of reduced kidney function such as hypertension, anaemia, malnutrition, neuropathy, and reduced quality of life as well as increased risk of cardiovascular disease and mortality, it is clear that CKD has widespread effects.

Over the past three decades, CKD has emerged as a primary health concern, and it has shown to affect not only physical but also psychological (e.g., depression) and social conditions of patients (e.g., unemployment) (Eckardt et al., 2016). It is important to have an early diagnosis and appropriate treatment to prevent further damage. Over half of all people requiring renal replacement therapy died due to a lack of access to dialysis or transplantation worldwide. Lack of access to renal replacement treatment in Africa, particularly middle and east Africa is the largest, because less than 3% of people requiring renal replacement therapy receive it. As a result, people with end-stage kidney disease continue to die in the face of established treatment options and countries which are equipped to provide dialysis or kidney transplantations are highly affected by the growing burden of CKD (Liyanage et al., 2016).

The burden of kidney disease has increased worldwide, with the population prevalence of chronic kidney disease now exceeding 10% in many countries. Even mild chronic kidney disease associates with a higher risk of mortality, and these individuals often have multi-morbidities that influences their survival (James et al., 2017). Kidney disease is under studied, despite this increased mortality risk and its associated high health care cost and resource utilization. Naghavi et al. (2018), state that chronic kidney disease is a worldwide public health problem, both for the number of patients and cost of treatment involved. And was a cause of 409,000 and 956,000 deaths in 1990 and 2013, respectively. Of those deaths, 46,000 (1990) and 173,000 (2013) were caused by CKD due to DM. Globally, diseases of the kidneys and those of urinary tract are the 12th cause of death and the 17th cause of disability. CKD affects around 10–13% of the general population. It has been estimated that more than 500 million individuals globally have CKD, regardless of the cause. In sub-Saharan Africa, CKD is a considerable health burden. CKD is at least 3–4 times more frequent in Africa than developed world (Naicker, 2016).

Due to increase in prevalence of people developing CKD and late presentation in the hospital, understanding the risk factors (smoking, indiscriminate use of NSAID, alcohol consumption, hypertension and diabetes) of kidney dysfunction and its indices (proteinuria, hematuria, and swollen feet) is of utmost importance (Dada et al., 2020). The researcher observed that Ebiraland people consume non-steroidal anti-inflammatory drugs (NSAID) indiscriminately due to the nature of their work (farming) and known to treat wide varieties of diseases with the use of herbal concoction (neem, known as dogoyaro, lemon grass, mango leave, pawpaw leave, eyere leave, iira, potase, alum, lime juice, ejinrin creeping stem, ajoo, ginger and garlics) but the effect on the kidneys is not known (Atawodi et al., 2019). Hence

this study was conducted to find out the prevalence and indices of chronic kidney disease among Ebira in Irasa community, Ado-Ekiti. The study specifically examined:

- i. the prevalence of chronic kidney disease among Ebira community in Irasa, Ado Ekiti;
- ii. the indices of chronic kidney disease among Ebira in Irasa community, Ado Ekiti;
- iii. the relationship between indices and development of chronic kidney disease among Ebira Community Irasa Ado Ekiti; and
- iv. the association between socio-demographic factors (Age, Sex and Educational level) and development of chronic kidney disease among residents of Ebira community Irasa, Ado-Ekiti

### Research Questions

The following research questions were raised in this study

1. What is the prevalence of chronic kidney disease among Ebira community in Irasa, Ado Ekiti?
2. What are the indices of chronic kidney disease among Ebira in Irasa community, Ado Ekiti?

### Research Hypotheses

The following research hypotheses were formulated for this study

1. There is no significant relationship between indices and development of chronic kidney disease among Ebira Community Irasa Ado Ekiti
2. There is no significant association between socio-demographic factors (Age, Sex and Educational level) and development of chronic kidney disease among residents of Ebira community Irasa, Ado-Ekiti

### Literature Review

Chronic Kidney Disease (CKD) stands as debilitating, chronic disorder in which there is failure of kidneys to perform required functions which thereby necessitate non-natural means of elimination of waste for survival. Peritoneal dialysis or hemodialysis is the primary means of achieving the process which is done three times weekly. Therefore, patients with CKD go through a number of lifestyle modifications, food and fluid restrictions in order to put up with their illness. These regime restrictions meaningfully impact on quality of life with patients carrying out a balancing act to ensure upkeep of vitamin, iron, and protein heights in the body. Such constraints can influence on patients' illness beliefs, sense of individual control resulting to anxiety and depression, hindering coping, and adjustment (Christensen & Ehlers, 2018).

Chronic kidney disease (CKD) has been a universal public health issue over the past decades and touches more than 10% people worldwide. Individuals with diabetes and hypertension are open to 50% risk of developing CKD. Inadequate nutrition, lack of bodily activity and obesity are also stated to be linked with the growing risk of CKD. There is a growing incidence and prevalence of kidney failure, with poor results and high rate worldwide associated with substantial morbidity and mortality, demanding special consideration as one of the increasing public health problems. The occurrence of CKD in the wide-ranging population is 13.4% worldwide while collective prevalence of CKD is 10.1% in the general population, 24.7% and 16.6% among hypertensive and diabetes mellitus patients in Africa (Abd ElHafeez et al, 2018). CKD is more common in the elderly population.

Conversely, younger patients with CKD usually experience progressive loss of kidney function. However, 30% of patients over 65 years of age with CKD have steady disease. CKD is connected with an increased risk of cardiac disease and end-stage renal disease (ESRD). (O'Hare et al, 2017).

Chronic kidney disease (CKD) and its risk factors are clinically silent and asymptomatic in its earliest stages screening tests to identify CKD are largely laboratory-based and include determination of reduced kidney function or kidney damage through the analysis of creatinine from blood samples or protein levels in urine. Chronic kidney disease (CKD) is best diagnosed early and if managed appropriately, the progression can be prevented or delayed. Several methods for screening CKD based on stages have been introduced, screening tests vary in content and comprise of a physical examination and laboratory evaluation or imaging studies. Clinical characteristics of chronic kidney disease in patients or individuals with chronic kidney disease (CKD) are hidden. Investigations of the predictive performance of relevant clinical and laboratory markers for the presence of risk factors of chronic kidney disease are primary concerns.

Urinary albumin-to-creatinine ratio (ACR) is the most commonly used clinical method to detect early disease progression. Initial testing of proteinuria in an early morning, urine albumin-to-creatinine ratio (ACR), urine protein-to-creatinine (PCR), reagent strip urinalysis for total protein greater than or equal to 30 mg/g and or greater than or equal to 3mg/mmol of creatinine confirms a diagnosis of microalbuminuria, and has been reported to be excellent predictor for developing CKD (KDIGO, 2012). On physical examination, hypertension is taken to be present if there is a report of prior diagnosis of hypertension at a hospital and being on hypertensive medications. Elevated blood pressure is defined as systolic blood pressure of greater than 140mmHg and diastolic blood pressure of greater than 90mmHg. Diabetes is also taken to be present if there is a report of prior diagnosis at a hospital and being on hypoglycaemic medications. Screening for proteinuria should be selected and performed according to local guidelines. Verification of proteinuria would require two out of three positive tests. Serum creatinine (Cr) and blood urea nitrogen (BUN) levels as indicators for glomerular filtration rate (GFR) help to define kidney damage as the rate of increase or the trend of serum Cr and BUN levels can indicate the presence of CKD. Equations for estimating GFR should be appropriate for standardization of the method and application to majority racial and ethnic groups (Nielsen et al., 2016).

According to KDIGO 2012, assess GFR and albuminuria at least annually in people with CKD and assess GFR and albuminuria in individuals at higher risk of progression and or where measurement impact therapeutic decisions. Screening for risk factors for chronic kidney disease should be according to available guidelines either local or international. Marzieh et al (2017) conducted a hospital based cross-sectional study during which blood and urine samples were collected for CKD screening. Glomerular filtration rate (GFR) was estimated from serum creatinine using CKD epidemiology collaboration (CKD-EPI) equation, and CKD was defined using estimated GFR (e-GFR) and albuminuria. The prevalence of CKD was 26%. In this study uncontrolled blood pressure and fasting blood sugar (greater than or equal to 50 mg/dl) were the predictors of CKD. Risk

In another study by Saber et al in 2017, the CKD was significantly higher in females, the prevalence of hypertension and diabetes mellitus were 20% and 14% respectively. And people over 50 years old, overweight or obese individuals, and participants with hypercholesterolemia were at risk of CKD. Akpan and Ekrikpo (2017) conducted a study in which subjects had measurements of their blood pressure, random blood sugar, urinalysis, serum creatinine, and anthropometric data. A family history of CKD was found in 4.3% of the study participants. There is a high prevalence of risk factors for CKD among the participants.

Another study by Awobusuyi et al (2016) on indices of Kidney damage in South-West Nigeria where 326 members were screened concluded that the prevalence of indices of kidney damage is high as participants had both haematuria and proteinuria. And also GFR less than 60 mls/min, elevated blood pressure, diabetes, obese hyper-cholesterolaemia, and hyper-triglyceridaemia. Prevalence of both smoking and alcohol consumption was also observed.

**Methodology**

A quantitative research, which employed cross-sectional descriptive design, was used to determine the prevalence and indices of chronic kidney disease among Ebira community at Irasa, in Ado- Ekiti, Ekiti State. The study population was both men and women in the Ebira community at Irasa, Ado – Ekiti. A sample size of two hundred and twenty (220) participants was selected in the community using purposive and convenience sampling technique. It was arrived at using margin error of five percent (5%) which give a confidence level of ninety-five percent (95%).

To get sample size Yamane’s rule was used.

$$n = \frac{N}{1 + N(e^2)}$$

N = Total population

e = Acceptable error (0.05)

n = Desired sample size

Total population (N) = 396

$$\frac{396}{1 + 396(0.05)} \quad n =$$

$$\frac{396}{1 + 396(0.0025)}$$

$$\frac{396}{1 + 0.99} =$$

$$\frac{396}{1.99} =$$

198.99  
=199



In order to give room for non-response, 10% attrition will be calculated and added to the sample size.

Total sample size = 199 + 20 = 219. Approximately 220

The instrument for this study was questionnaire comprising of 3 sections which was administered on 220 participants, section A was used to elicit information of the respondents' socio demographic data. Section B was about the indices of chronic kidney disease while Section C involved the use of biophysical measurements and laboratory investigations namely blood pressure, weight, height, urinalysis, urea and creatinine to determine the prevalence of chronic kidney disease among the study population. The instrument for data collection was validated by experts in Nursing Science who ensured the face and content validity. Data collected was analyzed using descriptive and inferential statistics. Chi-square was employed to determine the relationship between the variables at 0.05 level of significance.

## Results

**Table 1: Respondents' socio-demographic characteristics**

Variables		Frequency (n)	Percent (%)
Age	18-32	87	39.5
	33-47	71	32.3
	48-62	36	16.4
	62 and above	26	11.8
	Total	220	100.0
Sex	Male	75	34.1
	Female	145	65.9
	Total	220	100.0
Marital Status	Single	17	7.7
	Married	200	90.9
	Divorce	1	.5
	Widow	2	.9
	Total	220	100.0
Religion	Christianity	10	4.5
	Islam	210	95.5
	Total	220	100.0
Educational Level	No formal education	120	54.5
	Primary	67	30.5
	Secondary	27	12.3
	Tertiary	6	2.7
	Total	220	100.0
Ethnicity	Yoruba	1	.5
	Others	219	99.5
	Total	220	100.0
Profession	Unemployed	18	8.2
	self employed	194	88.2

	civil servant	8	3.6
	Total	220	100.0

Table 1 shows the socio- demographic characteristics of participants. From the 220 participants recruited, participant's age shows that 87 (39.5%) are within the age range of 18-32 years, while 26 (11.8%) are 62 years and above. Data shows 75 (34.1%) are male while 145 (65.9%) are female. Vast majority 200 (90.5%) of participants are married. It was observed that 10 (4.5%) were Christians, while 210 (95.5%) were Islam. More than half 120 (54.5%) had no formal education, 67 (30.5%) had primary education, 27 (12.3%) secondary, while 6 (2.7%) had tertiary level. Yoruba accounted for only 1 (0.5%), while 219 (99.5%) were of Ebira tribe. Furthermore, 18 (8.2%) of the participants were unemployed, 194 (88.2%) self-employed and (3.6%) are civil servants.

**Research Question 1:** What is the prevalence of chronic kidney disease among Ebira community in Irasa, Ado Ekiti?

**Table 2: Prevalence of CKD among Ebira community in Irasa Ado-Ekiti**

GFR	Frequency	Percent	Valid Percent	Cumulative Percent
Normal	193	87.7	87.7	87.7
Abnormal	27	12.3	12.3	100.0
Total	220	100.0	100.0	

Table 2 shows that 12.3% were abnormal as against 87.7% that is normal when measured against normal value of GFR 90ml/min/1.73 m<sup>2</sup> using Cockcroft- Gault Formula and the presence of 2++ of protein in the urine.

**Research Question 2:** What are the indices of chronic kidney disease among Ebira in Irasa community, Ado Ekiti?

**Table 3: indices of CKD among Ebira in Irasa community, Ado-Ekiti**

Variables	GFR			Total
	Normal	Abnormal		
Hematuria	Positive	4 (50.0%)	4 (50.0%)	8
	Negative	189 (89.2%)	23 (10.8%)	212
Proteinuria	Positive	31 (67.4%)	15 (32.6%)	46
	Negative	162 (93.1%)	12 (6.9%)	174
Swollen feet (S/F)	Yes	3 (100.0%)	0 (0.0%)	3
	No	190 (87.6%)	27 (12.4%)	217

Table 3 shows Indices of chronic kidney disease among Ebira residing in Irasa Ado Ekiti have hematuria with 50% of abnormal kidney function as against 10.8% without hematuria and proteinuria with decline renal function of 32.6% against 6.9% without proteinuria while swollen feet with abnormal kidney function of 0.0% and without swollen feet of 12.4%. Therefore, hematuria and proteinuria are the indices of CKD among the studied population while swollen feet is not

### Hypotheses Testing



**Hypothesis 1:** There is no significant relationship between indices and development of chronic kidney disease among Ebira Community Irasa Ado Ekiti

**Table 4: Chi-Square analysis showing relationship between indices and development of CKD**

		GFR		Total	$\chi^2$	df	sig
		Normal	Abnormal				
Hematuria	Positive	4	4	8	10.975	1	0.001
	Negative	189	23	212			
Total		193	27	220			
Proteinuria	Positive	31	15	46	22.340	1	<0.001
	Negative	162	12	174			
Total		193	27	220			
Swollen feet	Yes	3	0	3	0.425	1	0.514
	No	190	27	217			
Total		193	27	220			

Table 4 shows relationship development of chronic kidney disease among Ebira in Irasa community in Ado-Ekiti and hematuria (indices) was significant with value of 10.975 which was less than the alpha value of 0.05, where the  $\chi^2_{cal}$  was 10.975, ( $\chi^2 = 10.975$ ,  $p=0.001$ ). The null hypothesis which stated that there is no significant relationship between hematuria (indices) among Ebira in Irasa community Ado-Ekiti and development of chronic kidney disease this was therefore rejected. This means that there is a function of CKD development. The same table of 4 shows relationship development of chronic kidney disease among Ebira in Irasa community in Ado-Ekiti and proteinuria (indices) was significant with value of 22.340 which was less than the alpha value of 0.05, where the  $\chi^2_{cal}$  was 22.340, ( $\chi^2 = 22.340$ ,  $p=0.000$ ). The null hypothesis which stated that there is no significant relationship between proteinuria (indices) among Ebira in Irasa community Ado-Ekiti and development of chronic kidney disease this was therefore rejected. This means that there is a function of CKD development.

Also swollen feet relationship development of chronic kidney disease among Ebira in Irasa community in Ado-Ekiti was investigated upon and had significant value of 0.425 which was more than the alpha value of 0.05, where the  $\chi^2_{cal}$  was 0.514, ( $\chi^2 = 0.514$ ,  $p=0.425$ ). The null hypothesis stated that there is no significant relationship between swollen feet (indices) among Ebira community dwelling in Irasa, Ado-Ekiti and the development of chronic kidney disease, this was therefore not rejected. This implies that there is no function of CKD development

**Hypothesis 2:** There is no significant association between socio-demographic factors (Age, Sex and Educational level) and development of chronic kidney disease among residents of Ebira community Irasa, Ado-Ekiti.

**Table 5: Chi-Square analysis showing association between socio-demographic factors and CKD development**

Variables	GFR	Total
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		Normal	Abnormal		$\chi^2$	df	P value
<b>Sex</b>	Male	72	3	75	7.233	1	0.007**
	Female	121	24	145			
<b>Total</b>		193	27	220			
<b>Age</b>	18-32	77	10	87	1.454	4	0.835
	33-47	63	8	71			
	48-62	32	4	36			
	62 and above	21	5	26			
<b>Total</b>		193	27	220			
<b>Educational Level</b>	No formal education	106	14	120	1.352	3	0.717
	Primary	57	10	67			
	Secondary	24	3	27			
	Tertiary	6	0	6			
<b>Total</b>		193	27	220			

In table 5, it was indicated that association between development of chronic kidney disease among Ebira in Irasa community in Ado-Ekiti and their sex was significant with value of 0.007 which was less than the alpha value of 0.05, where the  $\chi^2_{cal}$  was 7.233, ( $\chi^2 = 7.233$ ,  $p=0.007$ ). The null hypothesis stated that is no significant association between socio-demographic factors (Sex) and development of CKD among residents of Ebira community Irasa Ado-Ekiti was therefore rejected. It implies that the sex of Ebira in Irasa community Ado-Ekiti is a function of CKD development.

Similarly, same Table 5, revealed that the association between development of chronic kidney disease among Ebira in Irasa community in Ado-Ekiti and their age brackets was not significant with value of 0.835 which was more than the alpha value of 0.05, where the  $\chi^2_{cal}$  was 1.454, ( $\chi^2 = 1.454$ ,  $p=0.835$ ). The null hypothesis which stated that there is no significant association between socio-demographic factor (age) of Ebira in Irasa community Ado-Ekiti and development of chronic kidney disease was therefore not rejected.

Also considering same table 5, on the educational level, it was revealed that association between development of chronic kidney disease among Ebira community in Irasa, Ado-Ekiti, was not significant with the value of 0.717 which was more than the alpha value of 0.05, where  $\chi^2_{cal}$  was 1.352, ( $\chi^2 = 1.352$ ,  $p=0.717$ ). The null hypothesis which stated that there is no significant association between socio-demographic factor (educational level) of Ebira in Irasa community Ado-Ekiti and the development of chronic kidney disease was therefore not rejected.

### Discussion

The study revealed that the prevalence level among respondents showed that 27 (12.3%) were abnormal as against 193 (87.7%) that is normal when measured against kidney damage and GFR of 90ml/min/1.73 m<sup>2</sup> using Cockcroft- Gault Formular and the presence of 2++ of protein in the urine. This finding was in agreement with previously conducted studies

by Ala'a et al. (2017) with CKD prevalence of 16.4% and Wokoma et al (2016) with 11.7%. It was lower to the study of Marzieh et al. (2017) with CKD prevalence of 26%.

The study also revealed that investigation of hematuria as index of chronic kidney disease (CKD) showed that 50.0% of respondents had hematuria as against 10.8% that did not have hematuria. Research study conducted by Wokoma et al. (2016) participants 20.3%, had moderately impaired kidney function with hematuria as an index, which agreed with this study. Likewise, it was in line with the study conducted by Okoye et al. (2017) where hematuria accounted for 14.1% of CKD cases. Similarly, those with proteinuria and had CKD were 32.6% as against 6.9% without proteinuria and still came down with CKD hence proteinuria was reported to be an index of CKD in the studied population. The figure in this study was higher when compared with previously conducted studies by Dada et al. (2020) and Singh et al. (2018) where both had 13.1% and 17.2% respectively. Also harmonized the study conducted by Akpan and Ekrikpo (2017) where proteinuria (23.5%) indicated the development of CKD. While swollen feet with abnormal kidney function had 0.0% and without swollen feet of 12.4%, this showed swollen feet was not an index in the studied population.

### Conclusion

Based on the findings of this study, it is therefore concluded that the prevalence of chronic kidney disease was low but hematuria and proteinuria were identified as indices of CKD while swollen feet were not an index among the studied population in Irasa community.

### Recommendations

Based on the findings, the following recommendations are made.

1. House to house routine checkup should be done frequently among rural community dwellers by the community health nurses.
2. Community Health workers sent to the rural places should be adequately trained in the field of nephrology to enhance their cognitive power in identifying indices of chronic kidney disease thereby reducing the incidence of kidney diseases and reduce the cost of care.
3. Comprehensive health centers should be put in place in rural areas, to motivate people to visit in cases of health care needs, and make minor treatment/ investigation such as blood pressure check free.

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