

---

## MORBIDITY PATTERN OF CHRONIC KIDNEY DISEASE PATIENTS ADMITTED IN MUHAMMAD ABDULLAHI WASE TEACHING HOSPITAL KANO

Mustapha Usman Baba<sup>1</sup>, Shazali Umar Madaki<sup>2</sup>, Aisha Yahaya Zimit<sup>3</sup>,  
Tasi'u Lurwanu Sani<sup>3</sup>, Ismail Shehu<sup>4</sup>

1. Department of Statistics School of Technology, Kano State Polytechnic
2. Department of Statistics Kaduna Polytechnic.
3. Department of Art & Humanities, School of General Studies, Kano State Polytechnic.
4. Department of Urban and Regional Planning, School of Environmental Studies, Kano State Polytechnic.

Correspondence Email: [mubstatistics@kanopoly.edu.ng](mailto:mubstatistics@kanopoly.edu.ng)

### ABSTRACT

*Chronic kidney disease (CKD) is a worldwide major public health problem with high morbidity and mortality rates. Population-based studies have demonstrated that the prevalence of moderate to severe CKD increases with age. This age-related decline of renal function relies partly on structural modifications in the aging kidney. The study was identifying the morbidity pattern of chronic kidney disease patients admitted in Muhammad Abdullahi Wase Teaching Hospital Kano. A descriptive cross-sectional type of study was used. Data was collected using semi-structured questionnaire and it was analyzed using SPSS 25.0 version. In this study the mean age of the respondents was 43.10 years and most of the respondents (61.0%) were male. About 66% of the respondents were married and 82.0% of the respondents were Muslim. About 45.4% of the respondents had Secondary School level of education, followed by below Primary School Certificate Holders (21.3%) and 16.9% had no formal education. 30.6% of the respondents were housewives, followed by job holders (27.3%), small business holders (24.6%) and daily laborers (12.6%). The mean monthly income of the respondents (Family) was N280,400.6 Naira. The findings of our study reveal that 33.9% of the respondents had familial history of kidney disease and most of the history was from father's side of the family. More than seven-tenths of the respondents followed the diet as instructed by the doctor and most of them take medicine regularly as prescribed.*

**Key words:** Chronic Kidney disease CDK, Morbidity, Family.

## INTRODUCTION

Chronic kidney disease (CKD) is a worldwide major public health problem with high morbidity and mortality rates (James et al. 2010). Population-based studies have demonstrated that the prevalence of moderate to severe CKD increases with age (Levey et al. 2009). This age-related decline of renal function relies partly on structural modifications in the aging kidney (McLachlan, 1987). Until recent years, it was thought that chronic kidney disease (CKD) exhibited a predominantly linear progression pattern (Mitch et al. 1976), with a more rapid decline of renal function at later stages (Lee et al. 2011). Thus, it seemed difficult to slow or halt the progression of CKD at Stage 4 or 5. However, recent observational studies have shown that patterns of CKD progression may be highly heterogeneous, and trajectories of glomerular filtration rate (GFR) over time can fit patterns different from linear (Lemley et al. 2005).

CKD has an estimated global prevalence of 11%-13%. According to the World Health Organization (WHO), CKD contributes to nearly 850,000 deaths worldwide annually (WHO, 2018). CKD is characterized by multiple disorders affecting the morphology and functioning of kidneys (Santra et al. 2015). CKD patients present with several co-morbidities such as hypertension, diabetes mellitus, coronary artery disease and infection. The presence of these co-morbidities has a twofold impact on the patients - firstly, it increases the cost of treatment and secondly, it poses a challenge for the treatment of CKD patients (Ahlawat et al. 2015). Due the prescription of multiple medications, CKD patients are at higher risk of developing drug-related problems. They need complex therapeutic regimen which require frequent monitoring on a regular basis. Inappropriate use of drugs in these patients can lead to adverse drug reactions, increased hospital stays and increased cost of treatment (Pavitra et al. 2014). Drug utilization in CKD changes with time period, physician, disease conditions and population, which makes it important to study the drug utilization continuously over a period of time (Laporte JR, Orme, 2003). Drug utilization studies in CKD patients help to understand pattern of drug use. As CKD patients need lifelong therapy, it is very important to study the prescribing trends on a regular basis.

Kidney disease is associated with a tremendous economic burden. High-income countries typically spend more than 2–3% of their annual health-care budget on the treatment of end-stage kidney disease, even though those receiving such treatment represent under 0.03% of the total population. In 2010, 2.62 million people received dialysis worldwide and the need for dialysis was projected to double by 2030. Globally, the total cost of the treatment of the milder forms of chronic kidney disease appears to be much greater than the total cost of treating end-stage kidney disease. In 2015, in the United States of America, for example, Medicare expenditures on chronic and end-stage kidney disease were more than 64 billion and 34 billion United States dollars, respectively. Much of the expenditure, morbidity and mortality previously attributed to diabetes and hypertension are attributable to kidney disease and its complications (WHO 2018).

Despite the large population size of Nigeria with 180million people, little is known about the epidemiology of CKD in the general population. There is no national data on prevalence of CKD, and only few community-based studies were done in some regions of the country. A recent systematic review identified 7 population-based studies, 5 from the Southern part and 2 from the Northern part, the prevalence of CKD ranged from 2.5 to 26%. Oluyombo et al. Previously reported the prevalence of CKD of 18% in a rural community in South-Western Nigeria. Similar study in the South-East Nigeria found a prevalence of 11.4% in rural, and 11.7% in semi-urban dwellers. In addition, a study from North-West Nigeria in the recent

review documented CKD prevalence of 26%, suggesting overall high prevalence of CKD and indicating a need for more studies to understand the true burden of CKD in Nigerian population. Combining regional population-based studies with sufficient power allow to estimate the true magnitude of CKD where national data is lacking. Such aggregate data permit adjustment for confounding factors such as ethnicity, and prevalent risk factors in the regions. Nigeria is a multi-ethnicity nation with diverse socio-cultural practices and economic status that affect disease pattern, thus findings of few CKD studies in different regions are inconsistent. Notably, studies from North-Central comprising more than 25million people are scarce.

This is the Hospital used as the case study for this research paper.

## **METHODOLOGY**

This study was conducted at Muhammad Abdullahi Wase Teaching Hospital Kano Formerly known as Nassarawa Hospital Kano.

### **Research design**

This study was a descriptive cross-sectional study.

### **Study Period**

The study was carried out from April to August 2022.

### **Study population**

The study population were all the chronic kidney disease patients admitted in Muhammad Abdullahi Wase Teaching Hospital Kano.

### **Selection Criteria**

#### **Inclusion Criteria**

- Registered CKD patients in the selected hospital
- Patients who were available and willing to participate

#### **Exclusion Criteria**

- CKD patients who were seriously sick

### **Sample size**

$$n = Z^2 pq / d^2$$

Where n=sample size

$$z = 1.96$$

P=26%=0.26 (Prevalence of CKD in North West Nigeria reported as 26%). Olanrewaju et al. 2020

$$q = (1-p) = 1 - 0.26 = 0.74$$

$$d = 0.05$$

According to this formula the sample size calculated as 295.6. Due to time and practical constraints 183 patients were selected.

### Sampling Techniques

Purposive sampling technique

### Data Collection Procedure

The questionnaire used was pre-tested before starting the data collection and after getting consent of participation from the respondents, the data was collected using semi-structured questionnaire by face-to-face interview technique.

### Research Instrument

The set of a semi-structured questionnaire was used in this study

### Method of data analysis

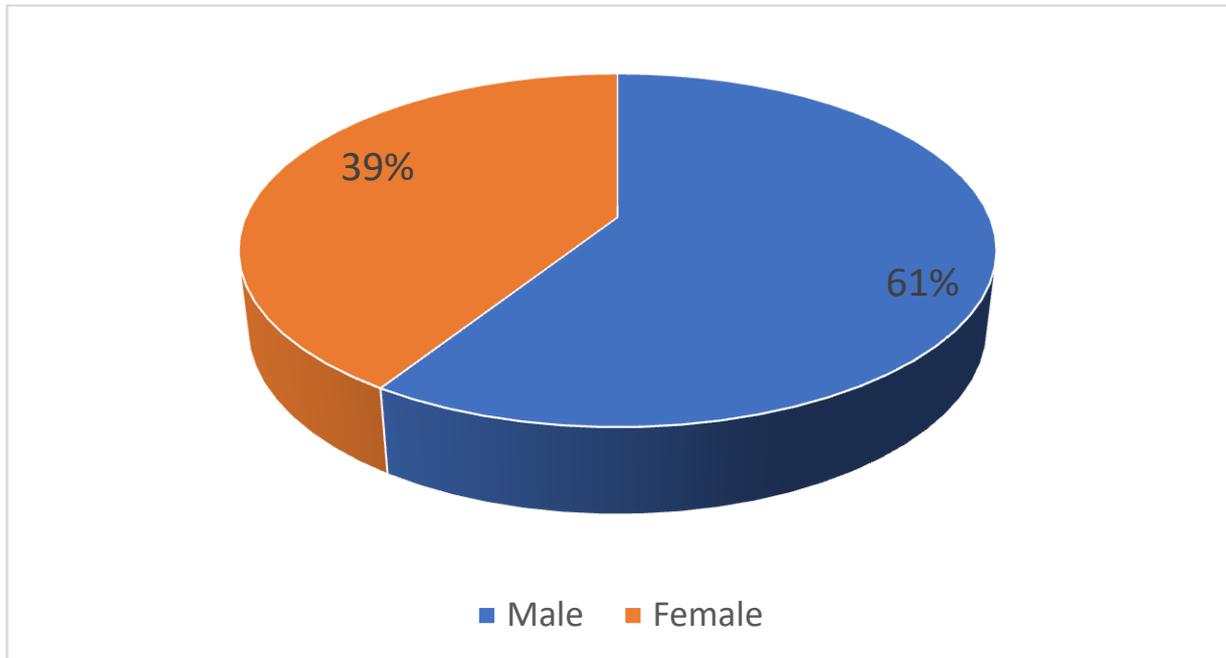
The coded data was entered into a database using SPSS software. Analysis was targeted on the study objectives and consideration of the indicators. Statistical tests like descriptive statistics as well as  $\chi^2$  tests were used to find the associations between variables. The p-value level of 0.05 or below was considered to test statistical significance.

## RESULT

Table 1: Distribution of the respondents according to age

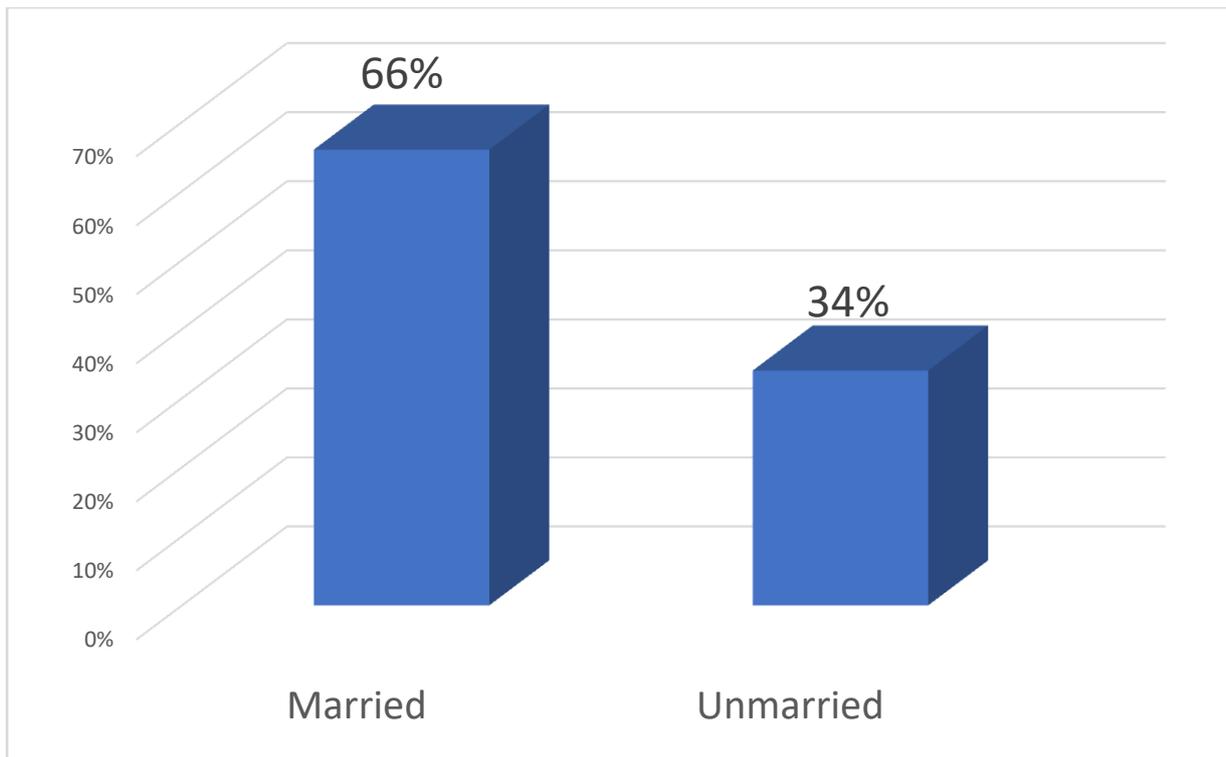
Age (years)	Number	Percentage
<28	54	29.5
29-39	72	39.3
40 & above	57	31.2
Total	183	100.0
Mean± SD	43.10±11.10	

Table 1 showed that about 39.3% of the respondents were in the age group 29-39 years, followed by 40 years and above (31.2%) and 29.5% were in the age group 28 years and below. The mean age of the respondents was 43.10 years.



**Figure 1: Distribution of respondents by Sex (n=183)**

Figure 1 showed that most of the respondents (61.0%) were male and the remaining respondents were female (39.0%).



**Figure 2: Distribution of respondents by Marital status (n=183)**

Figure 2 showed that about 66% of the respondents were married and the remaining of the respondents were unmarried.

**Table 2: Distribution of respondents by educational level**

Education	Frequency	Percentage
Non formal education	31	16.9
Primary School Cert	39	21.3
SSCE	83	45.4
Bachelor & above	22	12.0
Others	8	4.4
Total	183	100.0

Table 2 showed that 45.4% of the respondents had Secondary School level of education, followed by below Primary School Certificate holders (21.3%) and 16.9% had non formal education. About 12% had bachelor degree and above and 4.4% had other educational level.

**Table 3: Distribution of respondents by Family Monthly Income**

Income (Naira)	Frequency	Percent
≤200,000	62	33.9
210,000-310,000	92	50.3
320,000& above	29	15.8
<b>Total</b>	<b>183</b>	<b>100.0</b>
Mean± SD	284,000.6±70,000.1	

Table 3 showed that about 50.3% of the respondents (family) had 210,000-310,000 monthly family income, followed by 200,000 and below (33.9%) and 15.8% of them had 310,000 and above family monthly income, The mean monthly income of the respondents (family) was 284,000.6 Naira.

**Table 4: Morbidity pattern of chronic kidney disease patients (n=183)**

Items	Frequency	Percentage
Familial history for kidney disease		
Yes	62	33.9
No	121	66.1
If yes who? (n=62)		
Father	33	53.2
Mother	20	32.3
Others	9	14.5
Undergoing dialysis		
Yes	155	84.7
No	28	15.3
If yes, for how many years? (n=155)		
<5 years	130	83.9
5-10 years	24	15.5
>10 years	1	0.6

Table 4 shows that about 33.9% of the respondents had familial history of kidney disease and most of them (53.2%) from father's side, 32.3% from mother's side. About 84.7% of the respondents were undergoing dialysis and most of them (83.9%) were having the dialysis for <5 years.

**Table 5: Morbidity pattern of chronic kidney disease patients (n=183)**

Items	Frequency	Percentage
It is painful to have dialysis		
Yes	106	57.9
No	77	42.1
Get kidney transplantation		
Yes	4	2.2
No	179	97.8
Follow the diet as instructed by doctor		
Yes	130	71.0
No	53	29.0
Takes medicine regularly as prescribed		
Yes	121	66.1
No	62	33.9

Table 5 shows that about 57.9% of the respondent's mentioned that dialysis is painful and 2.2% of them had kidney transplantation. More than seven-tenths (71%) of the respondents mentioned they follow the diet as instructed by doctor and 66.1% of them take medicine regularly as prescribed.

**Table 6: Morbidity pattern of chronic kidney disease patients (n=183)**

Items	Frequency	Percentage
Diabetic		
Yes	99	54.1
No	84	45.9
Familial history of diabetic		
Yes	123	60.0
No	60	40.0
If yes who? (n=123)		
Father	51	41.5
Mother	31	25.2
Grandfather	18	14.6
Grandmother	12	9.8
Brother	8	6.5
Sister	3	2.4

Table 6 shows that about 54.1% of the respondents had diabetic and 60% of them had familial history of diabetic and most of the history was from fathers (41.5%), mother 25.2% and 14.6% from grandfathers.

**Table 7: Morbidity pattern of chronic kidney disease patients (n=183)**

Items	Frequency	Percentage
Taking medicine to control diabetes		
Yes	133	72.7
No	50	27.3
Obese/overweight		
Yes	95	51.9
No	88	48.1
Hypertension		
Yes	106	57.9
No	77	42.1
Taking any medicine for hypertension		
Yes	81	44.3
No	102	55.7

Table 7 shows that about 72.7% of the respondents mentioned they were taking medicine to control diabetes and 51.9% of them were obese/overweight. About 57.9% of the respondents had hypertension and 44.3% of them were taking medicine for hypertension.

**Table 8: Morbidity pattern of chronic kidney disease patients (n=183)**

Items	Frequency	Percentage
Diagnosed with glomerulonephritis		
Yes	120	65.6
No	63	34.4
If yes how for how long? (n=120)		
≤2 weeks	46	38.3
≥3 weeks	74	61.7
Parent had any other cardiovascular disease		
Yes	111	60.7
No	72	39.3
If yes, what are those diseases? (n=111)		
Coronary artery disease	17	15.3
Heart failure	16	14.4
Heart attack	24	21.6
Stroke	20	18.0
Hypertensive heart disease	28	25.2
Others	6	5.4

Table 8 shows that about 65.6% of the respondents were diagnosed with glomerulonephritis and most of them (61.7%) were diagnosed for 3 weeks and above. About 60.7% of the respondents mentioned they had parental history of other cardiovascular diseases and most of the disease was 25.2% hypertensive heart disease, 21.6% heart attack, 18% stroke, 15.3% CAD and the others (5.4%).

**Table 9: Morbidity pattern of chronic kidney disease patients (n=183)**

Items	Frequency	Percentage
Diagnosed with atrial fibrillation		
Yes	23	12.6
No	160	87.4
Suffer any heart failure		
Yes	61	33.3
No	122	66.7
Diagnosed with dyslipidemia		
Yes	50	27.3
No	133	72.7

Table 9 shows that 12.6% of the respondents were diagnosed with atrial fibrillation and 33.3% of them suffer heart failure. Close to three-tenths (27.3%) of the respondents were diagnosed with dyslipidemia.

**Table 10: Lifestyle pattern of the of chronic kidney disease patients (n=183)**

Items	frequency	Percentage
Smoke		
Yes	104	56.8
No	79	43.2
If yes, how often? (n=104)		
Occasional smoker	24	13.1
Regular smoker	80	86.9
If regular smoker, how many sticks per day (n=80)		
≤3 cigarettes/day	18	22.5
4-8 cigarettes/day	51	63.8
≥9 cigarettes/day	11	13.7

Table 10 shows that 56.8% of the respondents were found as smokers and majority (86.9%) were regular smokers and among the regular smokers 63.8% of them take 4-8 stick of cigarettes every day.

**Table 11: Lifestyle pattern of the of chronic kidney disease patients (n=183)**

Items	frequency	Percentage
Exercise regularly		
Yes	61	33.3
No	122	66.7
If yes how often? (n=61)		
<5 hour per week	7	11.5
6-10 hours per week	18	29.5
>10 hours per week	36	59.0

Table 11 shows that only 33% of the respondents were involved in regular exercises and most of them for more than 10 hours per week.

**Table 12: Association between Take Medicine Regularly as Prescribed and educational level**

Variables	Take Medicine Regularly as Prescribed			Chi-square	p-value
	Yes	No	Total		
<b>Education</b>					
No formal education	10	21	31		
Below SSC	20	19	39		
SSC-HSC	64	19	83	21.111	0.000
Bachelor & above	20	2	22		
Others	7	1	8		
Total	121	62	183		

Table 12 showed that educational level of the respondents was found to be significantly associated with taking medicine regularly as prescribed.

## FINDINGS AND RECOMMENDATIONS

The findings of our study reveal that 33.9% of the respondents had familial history of kidney disease and most of the history was from father's side of the family. More than seven-tenths of the respondents followed the diet as instructed by the doctor and most of them take medicine regularly as prescribed. It also reveals that more than half of the respondents had diabetic and hypertension. It further reported that 60.7% of the respondents had parental history of other cardiovascular diseases and most of the diseases are hypertensive heart disease, heart attack, stroke and CAD. The educational level of the respondents was found to be significantly associated with taking medicine regularly as prescribed.

### Recommendation

- There is a need to increase understanding regarding the knowledge of CKD through awareness programs. These efforts may improve the early detection and management of CKD.
- Further study in this area is recommended.

## REFERENCES

- Ahlawat R, Cruz SD, Tiwari P. Drug utilization pattern in chronic kidney disease patients at a tertiary care public teaching hospital: Evidence from a cross sectional study. *J Pharma Care Health Sys.* 2015 Dec;3:149-53.
- Anoop Gowda, Aswini Raghavendra Dutt, and Shobith Bangera. Clinical and demographic characteristics of chronic kidney disease patients in a tertiary facility in Ghana. *J Clin Diagn Res.* 2017 Aug; 11(8): OC25–OC28.
- Bacchetta J, Sea JL, Chun RF, Lisse TS, Wesseling-Perry K, Gales B, Adams JS, Salusky IB, Hewison M (2012) "FGF23 inhibits extra-renal synthesis of 1,25-dihydroxyvitamin D in human monocytes". *JBone Miner Res Aug.28 (1): 46–55.* doi:10.1002/jbmr.1740.
- Chinyere Mmanwanyi Wachukwu, Pedro Chimezie Emem-Chioma, Friday Samuel Wokoma, and Richard Ishmael Oko-Jaja Pattern and outcome of renal admissions at the

University of Port Harcourt Teaching Hospital, Nigeria: A 4 years review. *Ann Afr Med*. 2016 Apr-Jun; 15(2): 63–68.

- GBD 2013 Mortality and Causes of Death, Collaborators (17 December 2014). "Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013." *Lancet* 385 (9963): 117–171. doi:10.1016/S0140-6736(14)61682-2.
- Hill NR, Fatoba ST, Oke JL, Hirst JA, O'Callaghan CA, Lasserson DS, et al. Global prevalence of chronic kidney disease - a systematic review and meta-analysis. *PLoS One*. 2016 Jul;11(7).
- Hruska KA, Mathew S, Lund R, Qiu P, Pratt R (2008) "Hyperphosphatemia of chronic kidney disease". *Kidney Int*. 74 (2): 148–57. doi:10.1038/ki.130. PMC 2735026.PMID 18449174.
- Hsu RK, Chai B, Roy JA et al. Abrupt decline in kidney function before initiating hemodialysis and all-cause mortality: The Chronic Renal Insufficiency Cohort (CRIC) Study *Am J Kidney Dis* 2016; 68: 193–202
- Hunsicker LG, Adler S, Caggiula A et al. Predictors of the progression of renal disease in the Modification of Diet in Renal Disease Study. *Kidney Int* 1997; 51: 1908–1919
- James MT, Eriksen B, Ingebretsen OC. The progression of chronic kidney disease: A 10-year population based study of the effects of gender and age. *Kidney Int* 2006;69:375-82.
- James MT, Hemmelgarn BR, Tonelli M. Early recognition and prevention of chronic kidney disease. *Lancet* 2010;375:1296-309.
- Kenn B, Daratha, Robert A. Short, Cynthia F. Corbett, Michael E. Ring, Radica Alicic, Randall Choka and Katherine R. Tuttle. Risks of Subsequent Hospitalization and Death in Patients with Kidney Disease. *CJASN* March 2012, 7 (3) 409-416; DOI: <https://doi.org/10.2215/CJN.05070511>
- Kiran A Kantanavar, Rajendra Holla and Shobhana Nayak Rao. A study of prescription pattern in the drug therapy of chronic kidney disease. *International Journal of Pharmacological Research* 2017; 7(04): 81-87.
- Laporte JR, Orme ML. Drug utilization and the teaching of rational drug use. *WHO Reg Publ Eur*. 1993; 45:183.
- Lee P, Johansen K, Hsu CY. End-stage renal disease preceded by rapid declines in kidney function: a case series. *BMC Nephrol* 2011; 12: 5
- Levey A, Perrone R, Madias N. Serum creatinine and renal function. *Ann Rev Med* 1988; 39: 465–490
- Levey AS, Stevens LA, Schmid CH, et al. A new equation to estimate glomerular filtration rate. *Ann Intern Med* 2009; 150:604-12.
- Longo et al., Harrison's Principles of Internal Medicine, 18th ed., p.3109 8. Adrogué HJ, Madias NE (1981) "Changes in plasma potassium concentration during acute acid-base disturbances". *Am. J. Med* Sept...71 (3): 456–67. doi:10.1016/00029343(81)90182-0.
- McLachlan MS. Anatomic structural and vascular changes in the aging kidney. In: Macias Nunez JF, Cameron JS eds. *Renal function and disease in the elderly*. London: Butterworths; 1987. p. 3-26.
- Mitch WE, Walser M, Buffington GA et al. A simple method of estimating progression of chronic renal failure. *Lancet* 1976; 2:1326–1328
- O'Hare AM, Choi AI, Bertenthal D, Bacchetti P, Garg AX, Kaufman JS, et al. (2007) Age affects outcomes in chronic kidney disease. *J Am Soc Nephrol*. Oct. 18(10):275865.

- Olanrewaju et al. Prevalence of chronic kidney disease and risk factors in North-Central Nigeria: a population-based survey. *BMC Nephrology* (2020) 21:467 <https://doi.org/10.1186/s12882-020-02126-8>
- Pavitra R Y, Geetha M, Aggarwal R and Somashekar H S. Drug utilization pattern of antihypertensive drugs in chronic kidney disease patients in a tertiary care hospital. *IOSR J Dental Med Sci*. 2014 Nov;13(11):23-7.
- Plantinga LC, Tuot DS, Powe, NR. (2010) Awareness of chronic kidney disease among patients and providers. *Adv Chronic Kidney Dis.*; 17(3):225-236
- Rotich Joyce Cheron. The Prevalence and Risk Factors for Chronic Kidney Diseases in Kericho County, Kenya. *International Journal of Nursing* December 2017, Vol. 4, No. 2, pp. 90-105
- Santra S, Agrawal D, Kumar S, Mishra SS. A study on the drug utilization pattern in patients with chronic kidney disease with emphasis on antibiotics. *J Integrative Nephrol Androl*. 2015 Jul 1;2(3):85.
- Vecchio M, Navaneethan SD, Johnson DW, Lucisano G, Graziano G, Saglimbene V, Ruospo M, Querques M, Jannini EA, Strippoli GF (2010) "Interventions for treating sexual Dysfunction in patients with chronic kidney disease". *Cochrane Database Syst Rev* (12): CD007747. doi:10.1002/14651858.CD007747.
- World Health Organization: Burden of Disease Project. Available at: <http://www3.who.int/whosis/menu.cfm>. Accessed 22 October 2018.
- Yaw Ampem Amoako, Dennis Odai Laryea, George Bedu-Addo, Henry Andoh, Yaw Asante Awuku. *The Pan African Medical Journal*. 2014; 18:274. doi:10.11604/pamj.2014.18.274.4192
- Zhong Y, Muñoz A, Schwartz GJ et al. Nonlinear trajectory of GFR in children before RRT. *J Am Soc Nephrol* 2014; 25: 913–917