



*Full Length Research Paper*

# **Predisposing factors to chronic renal failure among clients attending kidney center of University of Maiduguri Teaching Hospital, North-Eastern, Nigeria**

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## **ABSTRACT**

Chronic renal failure is increasingly becoming a major public health problem, however with better understanding of predisposing factors associated with the disease, high risk clients will be able to guide against development of chronic renal failure. The study identified the predisposing factors to chronic renal failure among patient attending kidney centre of University of Maiduguri Teaching Hospital. A cross-sectional retrospective design was used for the study. A five- year retrospective data was collected from 250 patient's records using a self developed check list. Analysis was done using frequency count, percentages and chi-square test at 5% level of significance. The mean age of patients was 45±16.7. Majority of patients who attended the centre from 2009-2013 had at least hypertension, diabetic mellitus or established heart disease as primary conditions before developing chronic renal failure. The social life style of patients indicated that 14% of the patients were drug abusers, 9.2% smoke cigarette while 6.8% were alcoholics. Occupation of the patients was found to be associated with affordability of treatment regimen. The study suggests public enlightenment through mass media on social lifestyles influencing development of chronic renal failure and regular medical check-up to prevent chronic renal failure.

**Keywords:** Predisposing factors, chronic renal failure, Maiduguri

## **INTRODUCTION**

Chronic kidney disease (CKD) is an ailment of fatality. Accordingly, many people are meeting their dooms around the world by the affliction of this disease. It is miserably factual that we barely perceive any symptom till the collapse takes place. Consequently, most of the time, it seems difficult to prevent the renal failure.

End-stage renal disease (ESRD) has reached epidemic proportion with more than 400,000 affected individuals in the United States and well over one million worldwide (Freedman et al., 2005). This staggering number represents only the tip of the iceberg, as the incidence of chronic kidney disease (CKD) is at least 30-fold higher than that of ESRD [Jones et al,2000]. The incidence of kidney disease, particularly diabetic kidney disease, is increasing rapidly in many disadvantage

populations throughout the world (Nelson et al., 2003).

Disadvantage populations are socioeconomically under-privileged, having limited access to health care and low socioeconomic status related to occupational and educational level. CKD and the development of end-stage renal disease due to type II diabetes mellitus (DM) and systemic hypertension are particularly common in the minority population in the USA, that is, African American, Hispanic, Asian American, and the natives, who are socioeconomically disadvantageous and may lack health insurance and have limited access to the health care (Frank et al., 2005). Renal disease is also increasing, with an age-adjusted incidence of treated end-stage renal disease in Australian aboriginals approximately 20 times that of non-aboriginal people and doubling every three to

four years (Wendy et al., 2009). In Sweden, low socioeconomic status related to occupational and educational level is associated with increased risk of chronic renal failure (Fored et al., 2003).

A major attempt to draw attention to the increasing cases of kidney failure in Nigeria five years ago, failed. Dr. Augustine Ohwovoriole, President, Diabetic Association of Nigeria had in the light of President Umaru Musa Yar'Adua's hospitalisation in Germany said there was projected annual growth rate of six to eight percent kidney failure in Nigeria (Augustine, 2012). It is needful to point out that the projected annual growth rate of kidney failure in Nigeria is beginning to unfold in some parts of the country. Report from medical records of the University of Maiduguri Teaching Hospital (UMTH) kidney center shows that from 2009 to 2013, about 250 patients presented at the center with kidney diseases and more than seventy percent of the clients presents with CKD which makes it almost impossible to guide against development of end-stage kidney disease.

Staging of CKD is based on estimation of renal function by glomerular filtration rate (GFR). GFR is calculated from serum creatinine by Cockcroft-Gault and Modification of Diet in Renal Disease (MDRD) equations (Morgan, 2008). According to Duncan et al (2007) there were a significant number of patients with normal serum creatinine level who had abnormal GFR with Cockcroft-Gault values  $\leq 50$  mL/min. This group of patients may remain unrecognized by primary care providers who rely on serum creatinine abnormality to identify renal insufficiency.

The prognosis of chronic renal failure is not promising; most patients experience a steady decline in renal function over a variable time course and if untreated can result in end-stage renal disease thereby necessitating dialysis or kidney transplantation (Riegel et al., 2003; Cambell and Kitty, 2004; Armitage et al., 2003; Burrows, 2005). It is pertinent to state that, medical conditions that cause rapid deterioration of renal function carry poor prognosis. People who smoke, have poorly controlled diabetes mellitus or are obese are likely to have their disease progress faster (Tonelli et al., 2006). All these are associated with high cost and long hospital stay creating untold burden on the already insufficient financial resources of the patient (Schoolwerth, 2006). However with better understanding of predisposing factors associated with chronic renal failure, high risk clients of chronic renal diseases and acute renal failure can be prevented from getting to the state of end stage renal disease (Nerlich et al., 2008). This study was designed to identify the co-morbid diseases, social lifestyle influencing the development of chronic renal disease and to determine the association between occupational affiliation and affordability of management regimen of chronic renal failure among patient attending kidney centre of UMTH.

## **MATERIALS AND METHODS**

### **Research Design**

A cross-sectional retrospective design was used for the study. It was designed to obtain information on the predisposing factors of chronic renal failure among clients attending kidney center UMTH from 2009-2013.

### **Study Setting**

The research was conducted in the University of Maiduguri Teaching Hospital at the kidney centre located in Jere Local Government of Borno State along Bama road Northeastern . It has a bed capacity of 650 beds; the hospital has a total land area of 773 hectares. The kidney centre is situated at the Southern part of the hospital opposite the blood transfusion service (NBTS).The center has a building with 12 rooms in which 3 rooms are use for dialysis for negative serous status patient,2 rooms for positive serous status patient, 2 rooms for consultation urologist,1 nurses' station,1 utility room for female nurses and 1 for male nurses,1 doctors room,1 treatment room. Staffing in the kidney centre include Nurses, Consultant urologists, senior registrar, house officers and medical record officers. The center is equipped with 10 functioning dialysis machine which are fresenius medical care 4008b,fresenius medical care 4008s,fresenius medical care 5008s,nipro dialysis machine and also gambro dialysis machine and other equipments for the care of the patient.

### **Target Population**

The target population for this study consists of the entire patient with chronic renal failure that attended kidney centre from 2009-2013 in UMTH. A total number of 250 patients attended the kidney centre within the 5 years period under study.

### **Sample and Sampling Technique**

No sampling technique was used in the study as all the patients were used in the study considering the small size of the population.

### **Instrument for Data Collection**

The data needed for the study were collected using a self developed checked list.The checklist used consist of demographic variables (age,sex,tribe,marital status), co-morbid disease to chronic renal failure,social lifestyle influencing development of chronic renal failure and economic factors associated with chronic renal failure. The data needed for the study were collected using a self developed checked list.The checklist used consist of

**Table 1.** Socio- demographic variables

<b>Age</b>	<b>Frequency</b>	<b>Percent</b>
11-20years	30	12.0
21-30years	24	9.6
31-40years	25	10.0
41-50years	46	18.4
51-60years	65	26.0
61and above	60	24.0
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Sex</b>		
Male	156	62.4
Female	94	37.6
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Marital status</b>		
Single	28	11.2
Married	222	88.8
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Occupation</b>		
Farmer	70	28
Driver	54	21.6
Traders	76	30.4
Civil servants	50	20
<b>Total</b>	<b>250</b>	<b>100</b>

**Table 2.** Co-morbid disease to Chronic Renal failure.

<b>Diabetics mellitus</b>	<b>Frequency</b>	<b>Percent</b>
Present	87	34.8
Absent	163	65.2
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Hypertension</b>		
Present	173	69.2
Absent	77	30.8
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Obesity</b>		
Present	23	9.2
Absent	227	90.8
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Sickle cell anaemia</b>		
Present	48	19.2
Absent	202	80.8
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Established heart problem</b>		
Present	15	6.0
Absent	235	94.0
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Chronic glomerulonephritis</b>		
Present	52	20.8
Absent	198	79.2
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Pyelonephritis</b>		
Present	18	7.2
Absent	232	92.8
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Other disease condition (tuberculosis, hepatitis, bronchitis &amp; HIV&amp;AIDS)</b>		
Present	12	4.8
Absent	238	95.2
<b>Total</b>	<b>250</b>	<b>100.0</b>

demographic variables (age,sex,tribe,marital status), co-morbid disease to chronic renal failure,social lifestyle

influencing development of chronic renal failure and economic factors associated with chronic renal failure.

**Table 3.** Social lifestyle influencing development of chronic renal failure

<b>Alcoholism</b>	<b>Frequency</b>	<b>Percent</b>
Present	17	6.8
Absent	233	93.2
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Smoking</b>		
Present	23	9.2
Absent	227	90.8
<b>Total</b>	<b>250</b>	<b>100.0</b>
<b>Exposure to toxic substance</b>		
Absent	250	100.0
Present		
<b>Total</b>	<b>250</b>	<b>100</b>
<b>Drug abuse</b>		
Present	35	14.0
Absent	215	86.0
<b>Total</b>	<b>250</b>	<b>100.0</b>

### Ethical Consideration

A letter was submitted to obtain permission from the ethical research committee of UMTH together with the research proposal. A week later, letter of approval signed by the research and ethical committee chairman was given to the researchers conveying permission to conduct the study, this approval letter was presented along with copy of introductory letter to the head of kidney center for permission to obtain data from the center.

### Method of Data Analysis

Data was analysed using descriptive statistics by the use of frequency table distribution, percentages and non-parametric statistics of chi-square was used to test the hypothesis at 5% level of significance.

### RESULTS

Table 1 shows that, 12.0% of patient were 11-20years of age, 9.6% were 21-30yrs, 10% were 31-40yrs, 18% were 41-50yrs and 26% were from 51-60yrs and 24% were 61 years and above with mean age of  $45 \pm 16.7$ . On gender distribution, majority were male 62.4% while female were 37.6%. Of the 250 patients who attended the centre, 88.8% were married while 11.2% were single. The occupation of the patients revealed that, 28% were farmers, 21.6% drivers, 30.4% traders and 20.0% were civil servants.

Table 2 shows the diseases conditions that predisposes patients to chronic renal failure in kidney center of UMTH. Majority of the patients had hypertension 69.2%, while few patients had other significant disease conditions like tuberculosis, hepatitis, bronchitis and HIV and AIDS.

### DISCUSSION OF FINDINGS

Findings from the study revealed that, 12% of the patients were between the age range of 11 and 20 years, 26% between 51 and 60 years and 24% were above 61 years with mean age of  $45 \pm 16.7$ . This indicates that, the disease cut across all age group. This age distribution is in consonant with a study conducted in Bangladesh on the prevalence of chronic kidney disease and its association with risk factors in disadvantaged population where it was found that prevalence of chronic kidney failure cut across all ages (Nurul et al., 2012). Furthermore the age distribution of the disease was reported in Sagamu, Nigeria where the researchers conducted a 10 year retrospective study of cases of chronic renal failure (CRF) at Olabisi Onabanjo University Teaching Hospital Sagamu Ogun state and reported that CRF cut across all age grades but with higher prevalence in males than in females (Alebiouisi et al., 2006). This age distribution may possibly be due to the fact that age is not a predisposing factor to the disease, rather previous unhealthy lifestyles and other related factors such as exposure to toxic substances can predispose an individual to the development of chronic renal failure (Weeden, 2007).

Analysing the primary diseases that predisposed patients to chronic renal failure, hypertension, diabetes mellitus, established heart problem, obesity and sickle cell anaemia were found to be the major primary diseases that may be responsible for chronic renal failure among patients attending University of Maiduguri Hospital kidney center. Other co-morbid diseases implicated were tuberculosis, hepatitis, bronchitis and HIV and AIDS glomerulonephritis and pyelonephritis. Similar findings were also reported by Alebiouisi et al in Olabisi Onabanjo University Teaching Hospital Sagamu Ogun State. Alebiouisi et al (2006) reported that the commonest causes of chronic renal failure were chronic glomerulonephritis, hypertensive nephrosclerosis and

**Table 4.** Cross- tabulation of Relationship Between Occupation and Affordability of Treatment Regimen

Occupation	Affordability		Total	Statistics	Remark,
	Afforded	Could not Afford			
Farmers	21(30.8)	49(39.2)	70(28.0)	$X^2_{cal}= 25$ DF= 3 $X^2_{tab}= 7.815$	Significant
Drivers	14(23.8)	40(30.2)	54(21.6)		
Traders	44(33.4)	32(42.6)	76(30.4)		
Civil Servants	31(22.0)	19(28.0)	50(20.0)		
Total	110(100)	140(100)	250(100)		

At p value of 0.05, occupation of the patients was statistically significant.

diabetes mellitus. Furthermore similar report was also made in a study conducted by Michael et al (2004) on chronic renal failure among Africans. In their study, they asserted that, chronic renal failure evolves from known renal or systemic diseases, although in some cases the pathogenesis remains unknown. The implication of these co-morbid disease conditions as primary to chronic renal failure may possibly be as a result of the fact that these disease conditions are responsible for diminished renal blood flow causing renal shut down (Suzanne et al., 2010).

Assessing the social lifestyle of patients managed in the kidney centre of University of Maiduguri Teaching Hospital for chronic renal failure shows that, none of them developed renal failure as a result of exposure to toxic substances. This finding contradicts that of Weeden (2007) who carried out a study to investigate occupational and environmental renal disease in Australia and documented a significant risk for chronic renal failure among workers exposed to lead, copper, chromium and other heavy metals. This may be due to the fact that Maiduguri is not a mining community and the resident do not have exposure to such substances in significant measures. Furthermore, lead and fumes which the patients were exposed to were not significant enough to warrant association with chronic renal failure.

Of the 250 patients that attended the centre from 2009 to 2013, 14% abused drugs, 9.2% smoke cigarettes while 6.8% were alcoholics. Contrary to this low incidence of chronic renal failure among drug abusers, cigarettes smokers and alcoholics is the report of Nurul et al (2012) in which the use of tobacco, cigarettes and over-doses of drugs were highly significant in predisposing patients to chronic renal failure. Although it is an established fact that most drugs and alcohol are excreted through the kidney, and in high doses they constitute a potential damage to the kidneys leading to chronic renal failure (Suzanne et al., 2010; Australian Kidney Foundation, 2012).

The relationship between occupation of the patients and affordability of treatment regimen was found to be significant. This finding is similar to the report of Micheal et al (2004) which showed that income-earning capacity, is often reduced among end stage renal disease (ESRD) patients and low income may be a consequence, rather

than a cause, of ESRD. Furthermore the reports of Aminu et al (2008) in United Kingdom and Marino et al (2010) in USA shows that Low socioeconomic status is associated with development, progression and un-affordable management of chronic kidney disease. This may be as a result of the disease burden on the patient as treatment is very expensive.

## CONCLUSION

In view of the finding from this study it is evident that the co-morbid factors that predisposed patients to chronic renal failure were hypertension, diabetes mellitus, established heart problem, obesity and sickle cell anaemia. On the social lifestyle influencing development of chronic renal failure among patient attending the kidney center, low incidence of the disease was reported among alcoholics, drugs abusers and cigarette smokers.

## RECOMMENDATIONS

- The health personnel should give adequate health education to clients on regular medical check-up to ensure early diagnosis and prompt management of renal diseases which will hitherto complicate to chronic renal failure.
- Mass mobilization and media jingles should be intensified to health educate the public on the social lifestyle influencing development of chronic renal failure.
- Regular and proper screening of patients to rule out the presence of co-morbid disease which can predispose an individual to chronic renal failure as early detection/diagnosis helps and timely intervention and delays the disease process.
- The government should put in place an advocating campaign for offering free dialysis to patients with chronic renal failure, this is because most patient with chronic renal failure complains of huge financial implication.
- National Health Insurance Scheme (NHIS) in Nigeria which is presently a benefit of federal civil servants alone should be expanded to cover the common man. This will alleviate the predicaments of people with low economic status as such enabling the "have not" to

afford treatment regimen for chronic renal failure.

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