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Original Article

Knowledge and Perception of Chronic Kidney Disease in a Semi-urban Community in North-east Nigeria

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ABSTRACT

Of the nine million individuals on dialysis worldwide, more than 90% are in developed countries with lower figures reported from lower to middle-income countries. This is mainly due to Unaffordability of this therapy by the great majority of people who are poor and living in rural areas. There is, therefore, the need for effective preventive measures to reduce the progression of patients to End-Stage Kidney Disease (ESKD). This can only be achieved by properly educating the people. This community-based cross-sectional study was conducted on World Kidney day 2018 at Bayara a semi-urban community near Bauchi metropolis. Interviewer-assisted questionnaires were administered to all individuals to assess the knowledge and perception of the participants. A total of 132 individuals completed the questionnaire out of which 81.8% were females. The mean age of the participants was 39.98±12.5 years and a range of 15-65 years. About 27.3% of the respondents didn't know the correct number and position of the kidney. 65% didn't know any risk factor for kidney disease while 4.5% and 1.5% could mention hypertension and diabetes mellitus.

Keywords: *Knowledge, Perception, Kidney disease, Semi-urban, Community*

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INTRODUCTION

The incidence and prevalence of end-stage kidney disease (ESKD) differ substantially across countries and regions. A systematic review estimated that of the nine million individuals requiring dialysis in 2010, more than 90% lived in developed countries with universal access to health care.[1] Lower figures are reported from lower to middle income countries largely due to poor access and high cost of renal replacement therapy (RRT). It has therefore become pertinent that in lower to middle income countries effective preventive measures need to be put in place to reduce the number of chronic kidney disease (CKD) progressing to end stage kidney disease. Therefore there is a need for a shift from expensive intervention to less expensive preventive approach. Identification of CKD requires recognition of individual risk and appropriate laboratory testing (serum creatinine and/or urine protein).[1] This is mainly because symptoms do not manifest in earlier stages; however, earlier-stage CKD can lead to several complications, such as anemia and mineral bone disorder, and poor outcomes, including cardiovascular events, morbidity and mortality.[2] Earlier recognition of CKD could prevent complications; reduce cardiovascular related outcomes,[3] in addition to slowing the progression to ESKD requiring dialysis or transplant.[2] It has also been found that early referral to Nephrologist improve outcome in those that progress to ESKD.[4,5]

In the United States (US) the awareness of CKD among people with glomerular filtration rate of 15-60ml/min was 24.3%, while in African Americans only 23.7% knew at least one laboratory test for kidney function.[6,7] In Australia white et al[8] found only 2.8% and 8.6% of AusDiab study participants could identify hypertension and diabetes as risk factors for CKD respectively. In Nigeria or indeed sub Saharan Africa knowledge and awareness of CKD and its risk factors is low which could be due to education and socio-economic factors. Oluyombo *et al*[9] studied 454 residents of a rural area in southwest Nigeria and found a prevalence of CKD awareness of 27.1%.

Various preventive strategies have been applied at community level to identify risk factors for CKD such as community sensitization program on world kidney day, free screening efforts for high-risk individuals like kidney early evaluation program (KEEP), and dissemination of clinical practice guidelines and recommendations for patients with CKD or its risk factors to providers.

Despite all these the level of CKD awareness remains unacceptably low. This is true for low to medium income countries where facilities for Renal replacement therapy (RRT) are lacking, or where available are concentrated in urban areas and extremely expensive, due to lack of reimbursement or subsidy.[9]

We set to assess the level of awareness of CKD and its risk factors among participants in a semi urban area of Bauchi metropolis as well as to determine the perception of the people on CKD management. This is in order to strengthen dissemination of knowledge and to provide basic information to policy makers on health care delivery and services.

MATERIALS AND METHODS

This is a community-based cross sectional study of all adults >18years who reside in Bayara (a semi urban area of Bauchi) and are willing to participate. It was part of the world kidney day activity organized by the renal unit of Abubakar Tafawa Balewa University Teaching Hospital aimed to raise awareness on risk factors for chronic kidney disease as well as preventive measures in the community. Participation was voluntary and all participants were assured of complete confidentiality. Questionnaires were filled by trained dialysis nurses, interns, and resident doctors under supervision of the Nephrologist.

The demographic profiles of the participants were obtained and family history of hypertension, diabetes mellitus, and chronic kidney disease as well as history of analgesic usage and herbal medicinal ingestion were recorded. Weight was measured with a standard weighing scale to the nearest kilogram with light clothing; height was measured with standiometer to the nearest centimeter. Knowledge and perception of kidney disease was assessed by the questions on location of the kidney, number of kidneys, symptoms of kidney disease, risk factors for kidney disease, and treatment of kidney disease.

Hypertension was defined according to joint national committee on prevention, detection, evaluation, and treatment of high blood pressure or current use of antihypertensive drugs.[10] Diabetes was defined according to the WHO criteria[11] or use of oral hypoglycemic agents and/or Insulin. The study was approved by the Ethical committee of Abubakar Tafawa Balewa University Teaching Hospital.

Statistical analysis was by statistical package for social sciences (SPSS) version 21. Continuous variables are expressed as mean ± standard deviation, while categorical variables are expressed as percentage and frequency. Student t test and chi square test were used to compare continuous and categorical variables respectively. Pearson rank order correlation was used to assess relationship between continuous variables. A P value of 0.05 was considered significant.

RESULTS

A total of 132 respondents were interviewed of which 108 (81.8%) were females with a ratio of 1:4. The mean age of the respondents was 39.98±12.5 years and a range between 15- 65 years, 98 (74.2%) were in the age range 26 to 55 years. Table 1 summarizes the demographic and clinical characteristics of the subjects. The main occupations of the respondents were trading (27%) and civil service (13.6%) while 9.1% and 7.6% were students and farmers respectively. Nearly half (48.4%) were Hausa-Fulani, 22 (16.7%) and 18 (13.6%) were Sayawa and Jarawa tribes respectively while 20 (15.2%) were from other ethnic group. One-fourth of the respondents have no formal or Islamic education and 14 (10.6%) have tertiary education.

Knowledge and Awareness of Kidney Disease

Of the 132 participants screened, 96 (72.7%) have heard about kidney disease mainly from hospitals (31.8%), radio/television stations (27.8%) and social media (3%). Participants with family history of CKD are more aware of kidney disease (χ^2 =4.40, df=1, P=0.03) than participants without family history of CKD. There is no significant difference in knowledge of kidney disease between the sexes (χ^2=0.07,df=1,P=0.78); however, participants with higher education are statistically more aware of kidney disease than participants with primary, qur'anic or no education.

Table 1: The demographic and clinical characteristics of the respondents

Variables	Mean (SD)
Male (%)	18.2
Age (yrs)	39.8 (±12.5)
Height (m)	1.5 (±0.07)
Weight(Kg)	64.3 (±12.9)
Body mass Index (Kg/m²)	25.9 (±5.1)
Systolic Blood pressure (mmHg)	128.2 (±20)
Diastolic blood pressure (mmHg)	80.5 (±12.6)
Random Blood sugar (mmol/L)	6.3 (±3.1)

Eight (6.1%) of the participants said there was only one kidney while 96 (72.7%) said there were two kidneys in human body. Figure 1 shows the proportion of participants in relation to their knowledge of location of the kidneys in the body. Respondents with family history of CKD knew the correct number of kidneys than respondents without family history (χ^2 =4.4, df=1, P= 0.036). Also respondents with higher education are more aware of kidney disease, the location of the kidneys, number of kidneys as well as function of the kidneys than respondents with either none or primary education only (χ^2 =5.87, df=1, P=0.015).

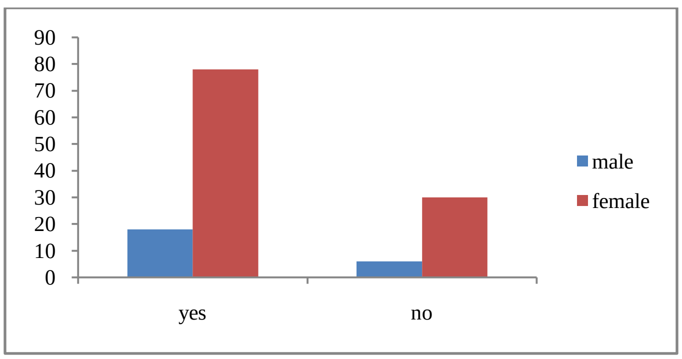
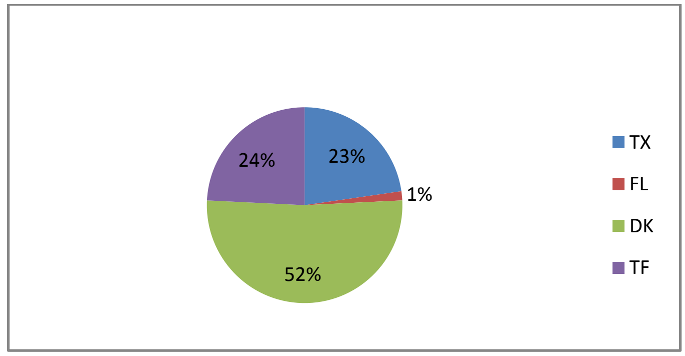


Figure 1 shows the proportion of respondents with good knowledge of kidney disease

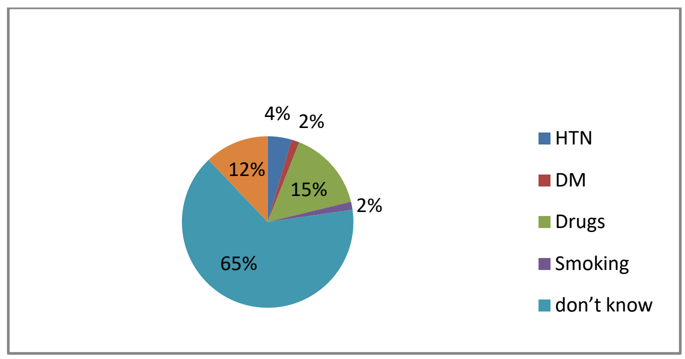
More than half of the participants had no knowledge of any function of the kidneys (fig.2) and this was similar among respondents who were hypertensives, or with family history of CKD, or diabetes mellitus. There was poor knowledge of risk factors for kidney disease as more than 65.2% of all the respondents did not know any risk factor (fig. 3 below) for kidney disease. Among respondents with FH of CKD, 16 (72.7%) don't know any risk factor for CKD while 4 (18.2%) mentioned hypertension and diabetes. Similar among respondents with FH of HTN, only 8 (10.5%) and 6 (7.9%) mentioned hypertension and drugs as risk factors for CKD.

There was no statistically significant association in knowledge of CKD risk factors between respondents with family history of CKD (χ^2 =0.4, df=1, P=0.06), hypertension (χ^2=0.62, df=1, P=0.25), Diabetes (χ^2=0.68, df=2, P=0.08).



Key: TX = toxin removal FL = fluid removal, DK = don't know, TF = removal of toxins and fluids.

Fig. 2 Showing responses on function of the kidneys.



Key: HTN = Hypertension, DM = Diabetes mellitus

Fig. 3 showing knowledge of risk factors among the respondents.

There was also no statistically significant difference in knowledge of symptoms of kidney disease among respondents with family history of CKD, hypertension or Diabetes mellitus. Likewise there was no statistical difference between respondents with higher education and those with lower level education.

Great majority (71.2%) believe kidney disease was a medical problem and better managed in health facility while 10 (7.6%) believed kidney disease was a spiritual problem and 18 (13.8%) believed kidney disease should be treated with traditional medicine.

Risk Factors for kidney Disease

Family history of chronic kidney disease was seen in 22 (16.7%) of the participants while forty-two respondents were known hypertensives out of which 18 (13.63%) had good blood pressure control and 24 (18.1%) had stage 1 and 2 hypertension. 22 (16.6%) were newly diagnosed hypertensives and diabetes mellitus was diagnosed in 4 (3%) respondents all were new. Table 2 shows the proportion of respondents with risk factors for kidney disease. Among the respondents 46 (34.8%) and 80 (60.6%) did not use analgesics or herbal medications indiscriminately.

Table 2 shows the prevalence of risk factors of CKD among the respondents

Risk factor	Number (percentage)
Family History of CKD	22 (16.7%)
Family History of Hypertension	76 (57.6%)
Family History of Diabetes	24 (18.2%)
Hypertension	64 (48.4%)
Old	42 (31.8%)
New	22 (16.6%)
Diabetes mellitus	4 (3%)
Obesity	24 (18.2%)

DISCUSSION

Health literacy is defined as the cognitive and social skills that determine the motivation and ability of individuals to gain access, understand, and use information in a manner that promotes and maintain good health.[12] Health literacy is an important concept in health promotion programs. Health literacy is also an important tool in self-management of chronic conditions such as CKD. Patients with CKD usually have other comorbid chronic conditions which may require additional health information. Further, there is clear correlation between inadequate health literacy and increased mortality rates.[13] People with low health literacy rate stay longer at home before coming to hospital and by the time they presented most often are in critical state.

In this study there is fair awareness of kidney disease in the community (72.7% awareness of kidney disease). This awareness was higher than reported by Oluyombo *et al* in Ilie local community in Southwest Nigeria.[14] In their study 33.7% of 454 rural inhabitants were aware of kidney disease mostly from the media. Two reasons can be adduced for this great disparity. Our study community was semi urban and close to the state capital and may have a better literacy level than a rural community. This is also reported by Stanifer *et al* among 656 participants from 431 urban and rural households in Northern Tanzania, who showed that living in rural area is associated with limited knowledge.[15] Secondly, the heterogenous nature of the inhabitants (different cultures and occupations), may increase their overall knowledge of kidney disease. Indeed it is obvious that whereas most of our study population heard about kidney disease in health facility compared to other sources such as social media.

The knowledge of number of kidneys and its function was fair as 72% and 48% of the respondents correctly mentioned number of kidneys and its function of waste removal respectively. This was lower than reported in a community survey in Ado Ekiti in which 325 respondents participated, out of which 76.3% and 76.3% knew the number of kidneys and its major functions, 84.1% also knew the exact location of the kidneys.[16] In Hong Kong Chow et al in a cross-sectional telephone survey of 516 community dwelling respondents found 84.1% and 72.1% having good knowledge of the functions of the kidney and correct number of kidneys respectively.[17] Perhaps this difference can be explained by the level of education of the respondents in two studies. In our study only about 10% of the respondents had tertiary education while 25% had no formal education, this is in contrast to the study in Ado Ekiti in which 66% of the respondents had tertiary education.

Knowledge of symptoms of kidney disease was not good in this study as about 63%, could not mentioned any symptom of kidney disease. This was lower than 78.4% and 89.4% obtained in two separate rural communities studies in southwestern states.[14,16] This could be due to higher awareness of kidney disease among our study respondents, majority of whom had heard about kidney disease in health facilities. Therefore the patients could be better informed about kidney diseases than respondents who heard about kidney disease through other means. Likewise knowledge of risk factors for CKD was low in this study as only 18% could mention hypertension and diabetes as CKD risk factors. Knowledge of CKD risk factors was higher in other studies from Nigeria. This can be explained partly by the reduced literacy level as well as the general phobia associated with CKD in our community.

Similarly knowledge of risk factors for CKD is comparable in both developing and developed countries. Knowledge of risk factors for CKD was also lower in an Iranian study, in which Roomizadeh *et al* screened 843 volunteers and only 14.4% and 12.7% mentioned hypertension and diabetes as risk factors for CKD.[18] In large study of US African American adults, only

12% and 14% could mentioned hypertension and diabetes as risk factors for kidney disease,[7] similar figures were obtained in a study among Australian adults who were predominantly Caucasians.[8] However in a more recent online survey of 24,662 Australian public, Gheewala *et al* reported 60.6% and 38.3% of individuals were aware of diabetes and hypertension as risk factors for CKD respectively.[19] In a large cross-sectional survey of 1250 respondents in a primary care public medical centre in Singapore, 51.2% were aware of hypertension, diabetes mellitus and genetics as risk factors for CKD. The wide knowledge gap could be explained by lower educational level of our study participants as well as the higher prevalence of the major risk factors of CKD (namely hypertension and diabetes) among the developed countries.

Among respondents with family history of CKD, hypertension and Diabetes, knowledge of risk factors for CKD was also poor. This is in contrast to a study in Columbia among 653 patients with moderate and high cardiovascular risks. Jorge et al showed that 94.3% and 44.4% of the patients knew hypertension and diabetes to be risk factors for CKD.[20] The difference could be explained by the longer duration of the patients on follow-up (up to 10 years) which will influence the patients cumulative knowledge over years. This is more glaring when comparing CKD patients with eGFR 15-59ml/min/1.73m^2 from National Health and Nutrition Evaluation survey (NHANES II) 1999-2008 data, in which only 9% of the patients with all stages of CKD were aware of their renal dysfunction.[21] It was however higher among NHANES II participants with moderately decreased renal function (stage 3 CKD).[6]

Although there is no significant difference in level of knowledge between sexes, and across age groups, respondents with higher education have a better awareness than respondents with lower educational level. This is similar to an observation by Chew et al who reported that respondents with older age, lower educational status, and lower monthly income were more likely to have limited knowledge of CKD.[15] Several other studies have documented the positive role of education on CKD awareness and outcome.[1,16,17] Similarly there is no difference in knowledge of symptoms of kidney disease among respondents with family history of CKD, Hypertension or Diabetes. Also among respondents with CKD risk factor the level of knowledge and awareness was low.

The perception of kidney disease by the respondents clearly shows that many believed kidney disease is a major and life threatening medical condition which should treated in health facility. Small proportion (7.6%) of the respondents believed kidney disease is a spiritual condition and is better managed by prayers. About 10% were of the opinion that kidney disease should be treated by herbal medications. These are the most dangerous as most of the herbal medications can have deleterious effect on the kidney thereby compromising the small residual kidney function. Therefore instead of getting cured of kidney disease may actually worsen it and aid in rapid progression to end-stage renal disease. Traditional belief has been part of the African culture, and many communities in Africa have its own belief.

While most often this belief leads to late presentation to health facility, most importantly the family would have been exhausted financially. Hence by the time they presented in hospital, they cannot be able to afford investigations and treatments that a necessary for effective management of the condition. This is similar to experience from southwestern of the country where 19% of respondents believed in herbal concoction as remedy for kidney disease. It is also similar to an observation in Tanzania in which 24.5% of 655 non-CKD adults from rural and semi urban communities in Kilmanjaro region believed that kidney disease should be treated by traditional healers. Another 20% believed kidney disease should be self-treated with home remedy.

This study has again highlighted the poor knowledge and negative perception of kidney disease by the community. Although several factors could explain this knowledge gap, most importantly educational level couple with the lower socio-economy of the communities is paramount. Cultural beliefs also play a prominent role in this regard, because most patients usually consult traditional or religious healers before coming to hospital. It has then become necessary for the relevant stakeholders to formulate and enforce policies aimed to improve the overall knowledge base of the people particularly in rural areas. This will improve on the negative perception of kidney disease and will ultimately ensure early presentation to health facility.

In this study we have evaluated risk factors for kidney disease in the community. Family history of hypertension, CKD and Diabetes mellitus was seen in 76 (57.6%), 22 (16.7%) and 24 (18.2%) respectively. Hypertension was seen in nearly half of the respondents with 42 (31.8%) being old hypertensives on treatment while 22 (16.6%) were newly diagnosed. Diabetes mellitus and obesity were seen in 4 (3%) and 24 (18.2%) of the respondents. This is closely similar to a systematic analysis of community-based studies evaluating risk factors for kidney disease. In the analysis prevalence of Hypertension, Diabetes mellitus and Obesity was 32.1%, 4.9% and 27.5% respectively.[22] It is also similar to reported prevalence of 39.1%, 23.4% and 12.7% of hypertension, obesity and diabetes mellitus in a community-based study in Senegal.[23]

CONCLUSION

Knowledge and perception of kidney disease is poor in the community.

RECOMMENDATION

There is the urgent need to improve the knowledge and perception of kidney disease among rural as well as semi urban and urban community in order to imbibe positive health seeking behavior.

LIMITATION

The predominance of the feminine gender may mask the community's overall perception of kidney disease.

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Conflict of interest

None declared

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