Prevalence and risk factors of chronic kidney disease among non-clinical Healthcare Providers at the Rivers State University Teaching Hospital Port-Harcourt, Nigeria

ORIGINAL RESEARCH

ABSTRACT

Background: Chronic kidney disease (CKD) oftentimes remains undiagnosed until it progresses to end-stage renal disease. To tackle this silent killer, awareness and screening are essential. Limited information is available regarding the prevalence of CKD among non-clinical healthcare providers (HCPs) who work in healthcare settings.
Aim: To determine the prevalence and associated CKD risk factors among non-clinical HCPs working at the Rivers State University Teaching Hospital Port Harcourt, Nigeria.

Study design: This was a cross-sectional study

Place and Duration of Study: Rivers State University Teaching Hospital, Port Harcourt, Rivers State, Nigeria March 10th 2022.

Methods: 165 non-clinical HCPs were screened for CKD. A self-administered questionnaire was used to obtain data including; past medical history, blood pressure and BMI. Blood and urine samples were obtained to determine the estimated Glomerular filtration rate (eGFR) and proteinuria. Associations of risk factors for CKD were determined by multivariate logistic regression and p-value significance <0.05.

Results: The prevalence of CKD was 12.7%. Most non-clinical HCPs were in stages 1-3. CKD was not significantly associated with any sociodemographic variable. Of all the participants, 20.6% were hypertensive, 7.3% were diabetic, 53.3% were either overweight or obese and 8.5% were proteinuric. CKD prevalence increased with age; <45 years (9.2%); >45 years (16.7%). The risk factors associated with CKD were diabetes (OR:5.9; CI:2.2-15.9), previously screened for kidney disease (OR:4.3; CI:1.6-13.4), pre-existing kidney disease (OR:8.2; CI:1.8-35.9) and on anti-hypertensives (OR:4.6; CI:1.8-12).

Conclusion: The prevalence of CKD among non-clinical HCPs in Rivers State is high. Diabetes, Hypertension and having a pre-existing kidney disease were the identified predictors for CKD. This study underscores the need for regular CKD screening and increased awareness among non-clinical healthcare providers.

Keywords: [Chronic Kidney Disease, Diabetes, Hypertension, Health Care Providers, Risk factors]]

1. INTRODUCTION

Chronic kidney disease (CKD) is defined as kidney damage or glomerular filtration rate ≤60ml/min/1.73m^2 for ≥3 months is a significant global health problem and affects people at an alarming rate [1]. Globally, it is estimated that the prevalence of CKD ranges between 8 – 16% and is the 16th leading cause of 'years of life lost' among those affected [2–4]. CKD disproportionately affects people residing in low-and-middle-income regions of the world, where screening and diagnosis rates are still low and is quickly emerging as a serious public health concern.

The prevalence of CKD in the African continent from two population-based systematic reviews was reported to range between 10.1% and 15.8% [5,6]. However, the pooled CKD prevalence in West Africa from both reviews revealed a range of 16.5% to 19.8%, which was the highest in the continent. There is no national data on the prevalence of CKD in Nigeria but community-based studies report prevalence ranging from 2.5 – 26% [7,8] and has been documented to become an increasing cause of morbidity and death.

Diabetes mellitus and hypertension are the two major causes of CKD worldwide [4]. Risk factors for CKD in Nigeria include hypertension, diabetes, and a family history of kidney disease. Other identified risk factors include advanced age, smoking, excessive alcohol consumption, obesity, use of herbal concoctions and prolonged use of non-steroidal anti-inflammatory medications (NSAIDs) [9–11]. Replete in the existing literature is the evidence that the main causes of CKD – asymptomatic hypertension and diabetes are highly prevalent[9–12], yet are often undiagnosed due to lack of screening for risk factors and associated with a low level of awareness in certain populations in Nigeria [13,14].

Non-clinical healthcare providers in this study are defined as patient navigators, and other personalities such as ward maids, technical assistants, nurse assistants and admin staffers, who interact with patients but do not dispense medical advice or carry out procedures [15]. Their importance in resource-constrained settings for patient and community engagement is increasingly being recognized, as they contribute to a significant workforce in the healthcare system in Nigeria [16]. Even so, they represent a group that could be at high risk and whose health risks frequently receive less attention. Because of their consistent work schedules in hospital care settings, it is sometimes thought that they are familiar with the fundamentals of health and illness states. This is because it may be assumed that their presence in hospitals might have afforded them, by proxy, considerable knowledge about diseases. Non-clinical staffers must be given adequate health education as they carry out their duties so they can be full beneficiaries of the health resources their work institutions provide [17].

Therefore, it is needful that these unintentionally often-ignored non-clinical healthcare providers be screened for CKD for them to be abreast of their CKD risks and were necessary be adequately educated and promptly managed to limit the progression to ESRD.

Whereas studies have been particularly conducted among clinical healthcare providers,[12,18] there are no studies on the prevalence of asymptomatic CKD in this silent yet vulnerable sector of the healthcare population in our setting. Since literature is scarce as regards the CKD prevalence and risk factors in them, we hypothesized that asymptomatic CKD may be higher in them. We, therefore, decided to study the prevalence of a positive CKD screening and identify its risk factors among non-clinical healthcare providers in Rivers State University Teaching Hospital, Rivers State, South-South Nigeria.

2. MATERIAL AND METHODS

This was a cross-sectional study carried out at the Rivers State University Teaching Hospital, Port Harcourt, Rivers State, South-South Nigeria. The study was conducted by the RSUTH Renal Study Group (RRSG) which comprises adult and paediatric nephrologists, nephrologists-in-training and nephrology nurses. Members of the RRSG were responsible for administering the questionnaires, physical measurements and urine and blood collection for laboratory tests. The renal unit House Officers in both the

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paediatric and adult nephrology teams were also involved in the registration of all consenting participants. The study was conducted on the 10th of March, 2022. During this, all members of the RRSG went on a sensitization tour around the hospital educating all patients, relatives and non-clinical health workers about chronic kidney disease.

Participants were consenting non-clinical healthcare providers drawn from all the departments of the hospital and included cleaners, casual workers, nurse assistants, administrative staff and all workers besides nurses and doctors who worked within the hospital community.

Sample size: A sample size of 162 was calculated using the Cochran formula and a prevalence of 12% from a previous study[19]. All non-clinical healthcare providers who gave consent and made themselves available for the CKD screening exercise were enrolled. A total of 190 participants were screened, however, complete data were obtained from 165 of the non-clinical-HCPs.

Operational definitions: As previously used in earlier studies[9,14],the following were defined: Hypertension as systolic BP >140 mmHg and/or diastolic BP >90 mmHg, Diabetes Mellitus as random blood glucose >200 mg (> 11.1mmol/L), Overweight as BMI of 25 to 29.9 and Obesity as BMI ≥30. A known hypertensive is one with a previous diagnosis of hypertension, and a known diabetic is one with a previous diagnosis of DM. A family history of DM, hypertension or kidney disease means a history of DM, hypertension or kidney disease in a relative. The definition of chronic kidney disease (CKD) was taken as an estimated glomerular filtration rate (eGFR) <60 ml/min/1.73m^2 (according to the CKD-EPI equation) ± proteinuria, the definition of hypertension was taken as a history of hypertension or new hypertension and definition of DM was taken as a history of DM + newly diagnosed DM. Proteinuria and glycosuria were defined as the presence of at least 1+ of protein and 1+ of glucose on a dipstick respectively.

Proteinuria and glycosuria were assessed using participants' urine samples and a Combi-9 dipstick. Random blood sugar was measured using the Accucheck Glucometer, and results were expressed in mmol/l. A sample of five millimetres (5mls) of venous blood was taken from each subject for assessment of serum creatinine. The samples were placed in lithium heparin bottles (gently mixed) and transported immediately to the chemical pathology laboratory. Serum creatinine was estimated by Jaffe's method.

Data analysis: Completed questionnaires were automatically imported to an Excel spreadsheet and analysed using SPSS v 26 (SPSS Inc., Chicago, Illinois, USA). Simple frequencies and cross tables were performed and relevant tables were developed. Bivariate analysis was used to assess a relationship between participants' sociodemographic and identified risk factor variables and the presence of CKD. Logistic regression analysis was conducted using the significant dichotomized risk factors (independent variables - being on hypertensive medications, having diabetes mellitus, being on diabetic medications, previous history of kidney disease, previously being screened for kidney disease - to demonstrate the strength of association with the presence of CKD. P-value < 0.05 was considered statistically significant.

3. RESULTS AND DISCUSSION

Socio-demographic characteristics of respondents

A total of 165 respondents were studied, 52 (31.5%) were males and 113 (68.5%) were females. The mean age was 46.48 ± 14.01 years, with an M: F ratio of 1:2.2. Almost half, 82 (49.7%) were between 25 and 44 years. Most 121 (73.3%) of the respondents live in urban communities, were married 102 (61.8%), earn a monthly stipend of <N30,000, 69 (41.8%) and have a tertiary level of education 109 (66.1%), as seen in table 1.

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Table 1. Sociodemographic characteristics of respondents

Variable	Frequency (n=165)	Percent
Age (years)		
Less than 45	87	52.7
45 – 65	78	47.3
Type of Community		
Rural	9	5.5
Semi-urban	35	21.2
Urban	121	73.3
Marital status		
Single	42	25.2
Married	102	61.8
Divorced/ Separated	4	2.4
Widowed	17	10.3
Monthly income		
Not Applicable	3	1.8
<N30,000	69	41.8
N30,000 – N74,999	57	34.5
N75,000 – N149,999	29	17.6
N150,000 – N199,999	4	2.4
≥N200,000	3	1.8
Highest Education		
No formal education	2	1.2
Primary	17	10.3
Secondary	37	22.4
Tertiary	109	66.1

Medical history of respondents

A review of the medical history of the respondents revealed that 56 (33.9%) had a history of hypertension, 44 (26.7%) take antihypertensives, 29 (17.6%) reported having diabetes mellitus, whereas, 21 (12.7%) were on anti-diabetic medications. Only 7 (4.2%) reported they smoke tobacco and about a third, 44 (26.7%) take alcoholic beverages. Although about a fifth, 20 (12.1%) use skin-lightening creams or soaps, nearly half 80(48.5%) reported they engaged in prolonged use of painkillers (NSAIDs). Interestingly, only about a third, 52 (31.5%) have been previously screened for kidney disease and barely 1 in 20(4.8%) of the respondents reported having been told they have kidney diseases (as seen in Figure 1).

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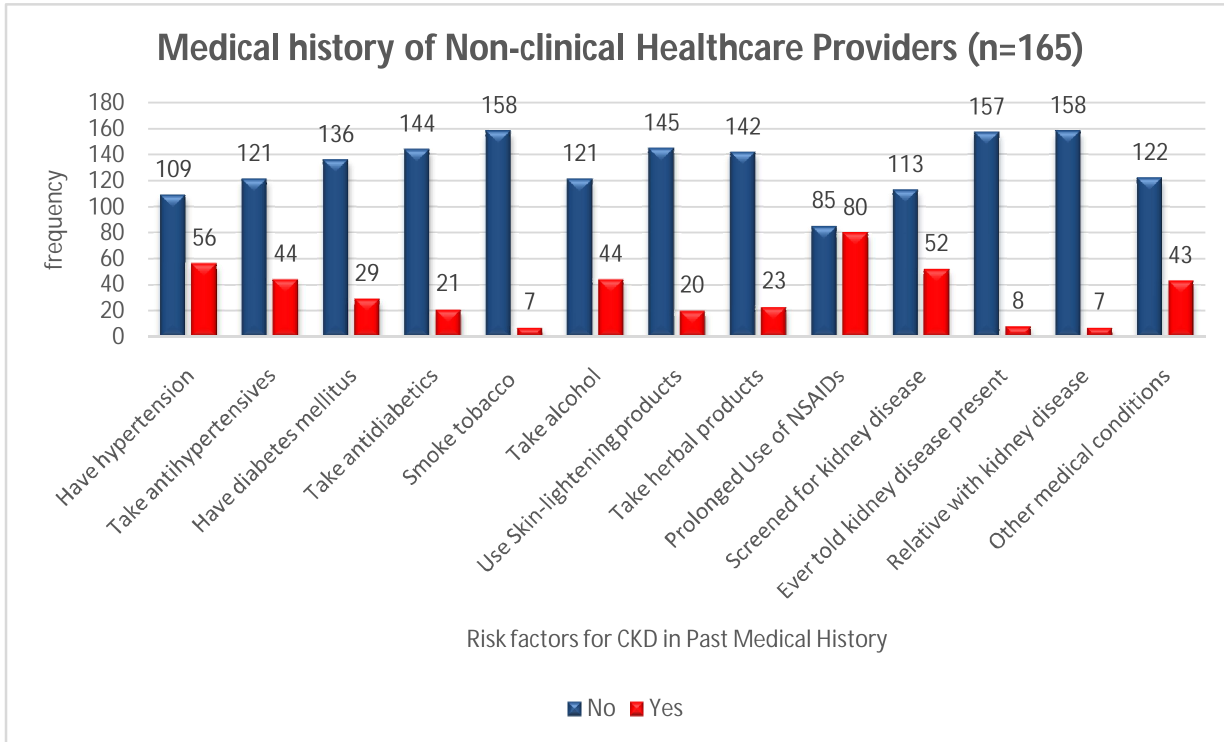

Figure 1: Medical history of Non-clinical Healthcare Providers

Respondents' Physical/biochemical parameters/ prevalence of CKD

The mean BMI was 26.37 ± 5.14 with about a fifth, 34 (20.6%) of respondents being obese. Also, 34 (20.6%) of respondents were found to have hypertension, and 12 (7.3%) were classified as having diabetes mellitus. The mean eGFR among the participants was 93.91 ± 32.73ml/min/1.73m^2 and 14(8.5%) of them had proteinuria as seen in Table II. However, twenty-one participants had estimated eGFR <60ml/min/1.73m^2, giving a CKD prevalence of 12.7% as displayed in Figure 2.

Table II. Physical/biochemical parameters/Prevalence of CKD

	Frequency (n=165)	Percent
BMI Status		
Underweight	6	3.6
Normal weight	71	43.0
Overweight	54	32.7
Obese	34	20.6
Hypertension status		
Hypertension absent	131	79.4
Hypertension present	34	20.6
Diabetes Mellitus status		
Diabetes Mellitus absent	153	92.7
Diabetes Mellitus present	12	7.3
Mean Random Blood Glucose	*6.72 (3.08)*	
Proteinuria		
Proteinuria absent	151	91.5
Proteinuria present	14	8.5