Prevalence, risk-inducing lifestyle, and perceived susceptibility to kidney diseases by gender among Nigerians residents in South Western Nigeria

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Abstract

Background: Kidney disease (KD) is increasingly recognized as a major public health problem worldwide with rising incidence and prevalence. Early identification of KD risk factors will slow down progression to kidney failure and death.

Objective: To determine the prevalence, risk-inducing lifestyle and perceived susceptibility among Nigerians in South-western Nigeria.

Methods: A pretested structured questionnaire was employed to draw information on socio-demographic, knowledge, risk-inducing lifestyle and perceived susceptibility to conventional risk factors of KD from 1757 residents aged ≥15 years.

Results: The mean age of the respondents was 47.61±13.0 years with a male-female ratio of 1.13:1. Knowledge of KD was low (mean score 2.29; 95% CI: 2.18, 2.32). The prevalence of some established KD risk factors was regular use of herbal medications, 26.8% and physical inactivity, 70.0%. Females with factors such as use of herbal drink [RRR: 1.56; CI=1.06-2.30; p=0.02] and smoking [RRR: 2.72; CI=1.37-5.37; p=0.00] predicted increased odds of perceived susceptibility to KD than their male counterparts.

Conclusion: The prevalence of KD risk-inducing lifestyles was high. More emphasis should be placed on effective public health programmes towards behavioural change in order to adopt lifestyle modification as well as to reduce the tendency to develop KD.

Keywords: Kidney disease; risk-inducing lifestyles; perceived susceptibility.

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Introduction

The rising incidence and prevalence of kidney disease (KD) is worldwide and contributes significantly to morbidity, mortality and decreased life expectancy of affected individuals, particularly with the poorest populations at the highest risk[1,2,3], posing great challenges for the affected persons, their families and the nation as a whole. The burden appears to be more evident in sub-Saharan Africa4 as it tends to affect middle-aged, elderly populations as well as relatively younger individuals in their prime and economically productive age cohorts[4,5]. Data from developed countries revealed that one out of eight adult Americans disclose evidence of KD[6] and comparable estimates have been reported in Asia countries[7,8]. Similar figures are lacking in Africa, including in Nigeria, owing to dearth of national registries of KD and limited surveys. Although, epidemiological and community-based studies in Nigeria have reported chronic kidney disease (CKD) incidence between 1.6% and 12.4%16 and prevalence of 11.4-18.8%[17,18].

Studies[9-11] have been conducted in different regions of Nigeria, with unpredictable outcomes to enumerate the magnitude of KD burden and its primary risk factors. Most of these studies were hospital-based. Their characterization of chronicity was based on duration of typical signs and symptoms inclining towards KD advanced stages[12,9]. These hospital-based studies fail to include individuals who lack access to healthcare[13,14]. Other factors contributing to KD burden in Nigeria include poor literacy level, inadequate knowledge of risk factors, dearth of KD prevention programmes, poor access to

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healthcare, late presentation, limited renal replacement therapy and its unaffordability, as well as harmful socio-cultural practices[15,3]. Previous studies[15-18,3] carried out in different parts of Nigeria revealed lifestyle risk factors such as age, elevated blood pressure (BP), presence of diabetes mellitus, obesity, habitual intake of analgesics and herbs associated with KD development or progression. Other risk factors like sedentary living and physical inactivity were documented as becoming prevalent among certain populations, predisposing them to complications such as obesity, and unmanaged hypertension, by extension, KD progression[19,11]. This situation could have been caused by low awareness and inadequate knowledge as well as poor perception, as noted in many Nigerian studies[16-17,3,11]. Thus, knowledge affects informed decision towards KD ailments and medical knowledge of KD health condition will inform an individual's action towards preventive strategies as well as risk factors modifications.

And since lifestyle and environmental factors influences major risk factors and causes of KD, population-based preventive strategies appear to be the cheapest and best solution to address KD burden. Emphasis on health risk awareness are likely to improve health behaviour of individuals and increase their risk perception as well as making themselves available for screening and early diagnosis[3,11]. With early identification of KD risk factors and diagnosis among individuals, its associated morbidity and mortality with its significant economic and public health burden will be reduced. No community-based study on prevalence, risk-inducing lifestyles and perceived susceptibility to KD by gender has been carried out in Lagos State to the best of the authors' knowledge. The aim of this study was to determine the prevalence and risk-inducing lifestyles as well as to evaluate predictors of perceived susceptibility to KD risk among Nigerians resident in Lagos State. This study adds to the body of knowledge in this area.

Methods

Study design and population

This was a cross-sectional study conducted in six urban and two rural local government areas (LGAs) of Lagos State, South-west Nigeria. The six urban LGAs were Lagos Island, Lagos Mainland, Ajeromi-Ifelodun, Somolu, Kosofe and Agege; while Epe and Ikorodu were the two rural LGAs. Lagos State was selected for this study owing to the fact that it featured prominently as one of the kidney-prone states in 2015[20]. Respondents who were 15 years or older constituted the study population.

A previous community-based study in Ekiti and Osun States of South-west Nigeria by Oluyombo et al. obtained a CKD prevalence of 14.2%[21]. The sample size for this study was extrapolated from that value, with 95% confidence and 5% error margin. Based on the appropriate sample size formula for study population greater than 10,000[22,21], this produced one thousand eight hundred (1,800) participants. This number was increased to one thousand eight hundred and fifty (1,850) to make allowance for possible non-responders and to increase the scope of the study. Informed and assent consent forms were taken from each of the respondents who agreed to participate in the study. The respondents who were <15 years, did not take part in the study; non-Nigerians as well as non-permanent residents in Lagos State were excluded from the study.

Sampling method

The multistage systematic sampling technique was used. According to the National Population Commission (NPC) of Nigeria Census of 2006, the estimated population of Lagos State, projected to 2016, was 12,479,240[23], using the projection formula. There are 75 selected urban and 38 rural enumeration areas (EAs), totalling 113 EAs in the eight sampled urban and rural LGAs, which served as the sampling units for the purpose of this study. Twenty-four EAs (representing 39% of the total EAs) were selected randomly by balloting. The population of the respondents from 15 years and above in the selected EAs was estimated using the NPC figures of 2006 projected to 2016 and estimated number of households at 6.5 persons. This gave 421,757. Dividing this estimated population (421,757) by the sample size (1,850) gave the sampling interval for systematic selection of participants, which was approximately 1:10. Hence one in every 10th respondents was given exclusive numbers for identification. The Kish conversion sheet was used to select the respondents for the study in each household[24]. In situations where the selected EAs were not adjacent, the first house in the next EA was regarded as an extension of the previous EA and the selection procedure continued.

Study procedure

The methodology used in this study was based on the KDIGO 2017 clinical practice guideline for the evaluation and management of CKD's recommended STEPS approach to KD surveillance with some modifications[1], which focuses on topics related to the diagnosis, evaluation, prevention and treatment of CKD. This is a simple, standardized guideline for collecting, analyzing and disseminating data from numerous stakeholders, includ-

ing patients, subject matter experts, and industry and national organizations. The guidelines approach focuses on obtaining core data on the established risk factors that determine the major disease burden and is designed to help countries build and strengthen their surveillance capacity. The STEPS instrument covers four different levels or 'steps' of risk factors assessment. These steps are questionnaire, physical measurements and biochemical measurements. Estimation of perceived susceptibility and psychological measurements was not part of the original STEPS instrument but was added in this study to correctly define the outcome variable of interest (perceived susceptibility to KD risk). This constituted a modification of to the original STEPS instrument.

The study was carried out in two phases. In the pilot phase, the study was pre-tested on ten percent of the sample size in a different enumeration area (EA). In the second phase, health talk was delivered at eight different community town halls in the EAs selected for the study. Attendees were informed of the study and those residing in the selected houses were expected to willingly participate in the study. A pre-tested semi-structured questionnaire was administered to each participant by a trained research assistant. Information about age, occupation, education, sex, marital status, income, religion, and risk-inducing lifestyles (alcohol, smoking, use of medicines without prescription, use of analgesics, sedentary living, and consumption pattern of poor diets) was obtained. The study commenced on 14 June 2016 and ended on 30 September 2016.

Definitions

Older age group was regarded as over 35 years in both sexes according to the definition given by Amarya et al. in developed countries[24]. For the purpose of this study, individuals with significant intake of herbal supplements or traditional drink were regarded as having any history of weekly intake of herbal supplement or traditional herb preparation for one month or more either currently or in the past. Analgesic abuse was regarded as cumulative lifetime use of more than 5000 pills of analgesics[25]. This was calculated from multiplying the average number of pills consumed in a week by the duration of use in years. Heavy smokers was regarded as those who smoke greater than or equal to 25 or more cigarettes a day[26]. The knowledge of KD was by a positive response to a question "Have you heard of KD before?" Knowledge and beliefs about KD were assessed by asking about the location, number and functions of the kidney, signs and symptoms of KD and knowledge of the risk factors. Using a calculated composite score for knowledge ranging from 0-28 of the knowledge questions, each item was first scored as true (1) or false (0) with the responses 'I do not know' and 'I am not very sure' as false. Then, the sum of the 28 scored items were obtained and composite scores were reported as mean (95% confidence interval [CI]) with overall weighted mean knowledge score of 3.33 (95% CI 2.92, 3.73). Similarly, for binary logistic regression for demographic predictors of KD knowledge by gender distribution, participants' knowledge was scored arbitrarily as good or poor based on the proportion of total score (28) and ≥14% of 28 questions (= ≥ 50%) was good while <14% of 28 questions (= <50%) was poor knowledge. Also, perceived susceptibility to KD risk was assessed with perception questions with total score of 60. However, perceived susceptibility was by a positive response to the question "Given your present lifestyles, how susceptible do you think you are to KD?" Perceived susceptibility to KD risk was categorized into three levels, namely: low, intermediate and high. Score <15% was low, 15%-29% was intermediate and ≥30% was high perceived susceptibility to KD risk. For the multinomial logistic regression, the respondents with no formal schooling were classified as non-educated, while those with primary, secondary and university schooling were classified as educated for the purpose of this study.

Ethical consideration

The study was approved by the Social Sciences and Humanities Research Ethics Committee (SSHEC) University of Ibadan (ref. no. UI/SSHEC/14/0003) and was conducted in compliance with the Helsinki Declaration and ethical consideration procedures. Informed and assent written consent forms were obtained from the participants where appropriate.

Statistical methods

Data were analyzed using SPSS version 22 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) Data were presented as mean ± standard deviation and categorical variables were compared using Chi-square and contingency tables. Multivariate binary logistics regression using variables whose univariate analysis was significant was used to estimate the independent association between KD risk-inducing lifestyles and gender distribution. The multinomial logistics regression was used to estimate and predict the relationship between perceived susceptibility and risk-inducing lifestyles in addition to demographic factors. The level of significance was set at $p \leq 0.05$.

Results

One thousand, eight hundred and fifty respondents were seen during the study period of whom one thousand seven hundred and fifty-seven had complete data. Table 1 shows the respondents' socio-demographic characteristics; which include 932 males and 825 females with a male-female ratio of 1.9:2. The peak age was 35+ years, with male mean age of 47.61 ± 13.0 years and female mean age of 33.45 ± 11.5 years respectively, with an overall mean age of 34.15± 10.6 years. The median age for male respondents was 50 years and 34 years for female respondents with an overall median age of 42.5 years (range 15 - 85+). The overall weighted mean knowledge score was 3.33 (95% CI 2.92, 3.73) out of twenty-eight possible points and males had a higher mean knowledge score compared to females (Table 1).

Table 1: Characteristics of study participants (Data are expressed as mean ± standard deviation, ratio, number, percentage and Chi-square)

Variables	Male n = 932; n (%)	Female n = 825; n (%)	Total= 1757; N (%)
Mean age ± s.d. (years)	47.61±13.0	33.45±11.5	34.15±10.6
Median age	50 years	34 years	42.5 years
Male to female ratio			1.9:2
Mean Knowledge score (95% CI)	2.45 (2.14, 3.23)	2.12 (2.08, 2.28)	2.29 (2.18, 2.32)
Age			
15 – 24 years	253 (27.1)	239 (29.0)	492 (28.0)
25 – 34 years	243 (26.1)	230 (27.9)	473 (25,9)
35+ years	436 (46.8)	356 (43.2)	792 (45.1)
Educational Level			
No schooling	26 (2.8)	20 (2.4)	46 (2.6)
Primary	81 (8.7)	53 (6.4)	134 (7.6)
Secondary and Above	825 (88.5)	752 (91.2)	1577 (89.8)
Ethnic group			
Yoruba	527 (56.5)	432 (52.4)	959 (54.6)
Igbo	246 (26.4)	257 (31.2)	503 (28.6)
Hausa	64 (6.9)	55 (6.7)	119 (6.8)
Others	95 (10.2)	81 (9.8)	176 (10.0)
Marital Status			
Single	546 (58.6)	441 (53.5)	987 (56.2)
Married	352 (37.8)	326 (39.5)	678 (38.6)
Previously married	34 (3.6)	58 (7.0)	92 (5.2)
Religion			
Christianity	673 (72.2)	603 (73.1)	1276 (72.6)
Islam	237 (25.4)	193 (23.4)	430 (24.5)
Traditionalist	22 (2.4)	29 (3.5)	51 (2.9)
Employment status			
Not working	201 (21.6)	240 (29.1)	441 (25.1)
Working	731 (78.4)	585 (70.9)	1316 (74.9)
Monthly Income			
Low	267 (28.6)	315 (38.2)	582 (33.1)
Middle	225 (24.1)	207 (25.1)	432 (24.6)
High	440 (47.2)	303 (36.7)	743 (42.3)
Setting			
Urban	696 (74.7)	624 (75.6)	1320 (75.1)
Rural	236 (25.3)	201 (24.4)	437 (24.9)

***p-value is significant at 0.05**

Table 2 shows the profile of self-reported risk-inducing lifestyles by gender distribution. The significant and commonest risk-inducing lifestyles reported were lack of daily activities (74.9%), use of herbal medications (26.8%), use of traditional herbal drink (46.4%), chronic ingestion of alcohol (33.2%), smoking (11.5%), physical inactivity (70.0%) and sedentary living (29.0%) as well as consumption pattern of poor diets (low vegetables (75.8%), low fruits (64.9%) and high processed dairy foods (48.4%).

Table 2: Profile of self-reported risk-inducing lifestyles by gender distribution (univariate analysis); (P<0.005)

Variables	Male, n = 932, n (%)	Female, n=825, n (%)	Total = 1757, N(%)	**OR	95% CI	p-value
Age (years)						
< 30	339 (36.4)	331 (40.1)	670 (38.1)	1.17	0.97–1.42	0.11
≥ 30	593 (63.6)	494 (59.9)	1087 (61.9)			
Daily Activities						
Yes	731 (78.4)	585 (70.9)	1316 (74.9)	0.67	0.54–0.83	0.00*
No	201 (21.6)	240 (29.1)	441 (25.1)			
Misuse of medicines	89 (9.5)	65 (7.9)	154 (8.8)	0.810	0.58–1.13	0.24
Yes	843 (90.5)	760 (92.1)	1603 (91.2)			
No						
Medicines without prescription	297 (31.9)	241 (29.2)	538 (30.6)	0.88	0.72–1.08	0.23
Yes	635 (68.1)	584 (70.8)	1219 (69.4)			
No						
Use of pain analgesics	284 (30.5)	219 (26.5)	503 (28.6)	0.83	0.67–1.02	0.07
Yes	648 (69.5)	606 (73.5)	1254 (71.4)			
No						
Use of herbal medications	271 (29.1)	200 (24.2)	471 (26.8)	0.78	0.63–0.97	0.02*
Yes	661 (70.9)	625 (75.8)	1286 (73.2)			
No						
Use of traditional herb drink	481 (51.6)	335 (40.6)	816 (46.4)	0.64	0.53–0.78	0.00*
Yes	461 (48.4)	490 (59.4)	941 (53.6)			
No						
Chronic ingestion of alcohol	408 (43.8)	176 (21.3)	584 (33.2)	0.35	0.28–0.43	0.00*
Yes	524 (56.2)	649 (78.7)	1173 (66.8)			
No						
Heavy smokers						
Yes	157 (16.8)	45 (5.5)	202 (11.5)	0.26	0.20–0.40	0.00*
No	775 (83.2)	780 (94.5)	1555 (88.5)			
Physical inactivity						
Yes	687 (73.7)	543 (65.8)	1230 (70.0)	0.69	0.56–0.84	0.00*
No	245 (26.3)	282 (34.2)	527 (30.0)			
Sedentary living						
Yes	250 (26.8)	276 (33.5)	526 (29.9)	1.37	1.12–1.68	0.00*
No	682 (73.2)	549 (66.5)	1231 (70.1)			
Poor diet						
Lack of vegetables & legumes	680 (73.0)	651 (78.9)	1331 (75.8)	1.39	1.11–1.73	0.00*
Yes	252 (27.0)	174 (21.1)	426 (24.2)			
No						
Lack of fruits						
Yes	581 (62.3)	559 (67.8)	1140 (64.9)	1.27	1.04–1.55	0.02*
No	351 (37.7)	266 (32.2)	617 (35.1)			
High in grain foods						
Yes	778 (83.5)	659 (79.9)	1437 (81.8)	0.79	0.62–1.00	0.05
No	154 (16.5)	166 (20.1)	320 (18.2)			
High in processed meats	729 (78.2)	640 (77.6)	1369 (77.9)	0.96	0.77–1.21	0.75
Yes	203 (21.8)	185 (22.4)	388 (22.1)			
No						
High in processed dairy foods	426 (45.7)	424 (51.4)	850 (48.4)	1.26	1.04–1.51	0.02*
Yes	506 (54.3)	401 (48.6)	907 (51.6)			
No						
High intake of fast foods	245 (26.3)	237 (28.7)	482 (27.4)	1.13	0.92–1.39	0.25
Yes	687 (73.7	588 (71.3)	1275 (72.8)			
No						

***p-value is significant at 0.05; ** OR= Odds ratio; ***OR = ≥1 denotes high perceived risk and OR = < 1 indicates low perceived risk**

As regards demographic predictors of KD knowledge by gender distribution, primary education (OR=13.33, CI=4.55-39.08, p<0.05), secondary+ education (OR=2.61, CI=1.67-4.14, p<0.05) and rural setting (OR=1.42, CI=1.03-1.97, p<0.05) significantly predicted increased odds of KD knowledge among male respondents more than their female counterparts (Table 3). Primary (OR=4.09, CI=1.61-10.37, p<0.05) and secondary/university education (OR=3.63, CI=2.04-6.46, p<0.05) were found to have higher odds of KD knowledge among the female respondents than their male counterparts (Table 3). Moreover, Fig 1 captures the distribution of respondents' perceived susceptibility to KD risks by gender. Both male and female respondents were found to have low perceived susceptibility to KD risk, with slight increase among the female respondents. However, 586 did not report their level of perceived susceptibility to KD risk.

Table 3: Binary logistic regression of demographic predictors of KD knowledge by gender distribution

	Males					Females				
Variables	**Coefficient (β)**	**Standard error**	**OR**	**P-value**	**CI 95%**	**Coefficient (β)**	**Standard error**	****OR**	**P-value**	**CI 95%**
Age (years)										
< 30										
≥ 30	-1.13	0.16	0.32	0.00*	0.23 – 0.44	-1.02	0.16	0.36	0.00*	0.26 – 0.50
Education										
No schooling										
Primary	2.59	0.55	13.33	0.00*	4.55 – 39.08	1.41	0.48	4.09	0.00*	1.61 – 10.37
Secondary & Above	0.96	0.24	2.61	0.00*	1.67 – 4.14	1.29	0.29	3.63	0.00*	2.04 – 6.46
Employment										
Not working										
Working	-0.12	0.17	0.89	0.47	0.64 – 1.23	0.18	0.16	1.20	0.28	0.87–1.65
Monthly Income										
Low	-1.19	0.17	0.31	0.00*	0.22 – 0.43	-1.10	0.18	0.33	0.00*	0.23 – 0.47
Middle	-0.28	0.18	0.76	0.13	0.53 – 1.08	-0.39	0.18	0.68	0.04*	0.47 – 0.97
High										
Religion										
Christianity										
Islam	-0.12	0.47	0.89	0.80	0.36 – 2.21	-0.87	0.38	0.42	0.02*	0.20 – 0.89
Traditionalist	0.47	0.48	1.59	0.33	0.63 – 4.05	-0.44	0.40	0.65	0.28	0.30 – 1.42
Setting										
Urban										
Rural	0.35	0.17	1.42	0.03*	1.03 – 1.97	0.07	0.17	1.08	0.67	0.77 – 1.51

*p-value is significant at 0.05; ** OR= Odds ratio; ***OR = ≥1 denotes good knowledge and OR = < 1 indicates poor knowledge

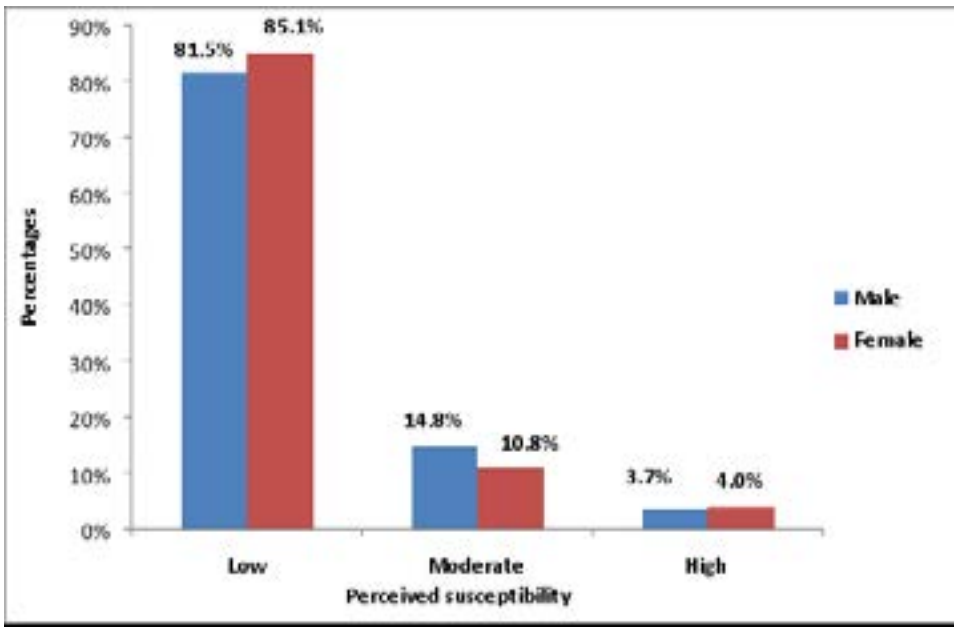

Figure 1: Respondents' perceived susceptibility to KD risk by gender

Table 4 shows the multinomial logistic regression analysis of adjusted independent predictors of perceived susceptibility to KD risk by gender distribution. The male respondents with either perceived intermediate or high susceptibility to KD risk with age ≥30 years [RRR: 1.12, CI=1.91-5.08, p<0.05], use of traditional herbal drink [RRR: 1.87, CI=0.89-1.92, p<0.05], chronic ingestion of alcohol [RRR: 1.84, CI=1.26-2.72, p<0.05] and smoking [RRR: 2.41, CI=1.53-3.80, p<0.05] were found to be respectively 11%, 19%, 18%, and 24%

higher, predicting high KD risk. As regards the female respondents, age ≥30 years [RRR: 2.27, CI=1.49-3.46, p<0.05], use of pain analgesics [RRR: 1.18, CI=0.55-1.27, p<0.05] and use of traditional herbal drink [RRR: 1.19, CI=0.84-1.67, p<0.05] were respectively found to be 23%, 12% and 12% higher predictors of KD risk (Table 4).

Table 4: Multinomial logistic regression analysis of risk-inducing lifestyles as predictors of perceived susceptibility to KD risk

Perceived Susceptibility (base outcome)	Male					Female				
	Intermediate		High		p-value	Intermediate		High		p-value
Social Characteristics	RRR	CI	RRR	CI		RRR	CI	RRR	CI	
Educational Level										
Non-educated										
Educated	0.37	0.26 – 0.53	0.52	0.33 – 0.82	0.01*	0.53	0.35 – 0.82	0.44	0.28 – 0.69	0.00*
Age (years)										
< 30										
≥ 30	1.02	0.75 – 1.39	1.12	1.91 – 5.08	0.00*	1.79	1.26 – 2.55	2.27	1.49 – 3.46	0.00*
Employment status										
Not working										
Working	0.93	0.64 – 1.35	1.01	0.64 – 1.61	0.70	1.11	0.78 – 1.59	0.48	0.30 – 0.79	0.00*
Setting										
Rural										
Urban	1.20	0.84 – 1.70	1.57	1.03 – 2.39	0.03*	2.22	1.53 – 3.22	1.56	1.00 – 2.42	0.05*
Medicines without prescription										
No										
Yes	0.61	0.17 – 1.18	0.37	0.05 – 2.87	0.34	1.08	0.21 – 5.60	1.55	0.30 – 8.10	0.60
Use of pain analgesics										
No										
Yes	0.60	0.43 – 0.83	0.61	0.40 – 0.91	0.02*	1.81	0.55 – 1.17	0.71	0.47 – 1.09	0.04*
Use of herbal medications										
No										
Yes	1.07	0.77 – 1.49	0.63	0.40 – 1.00	0.05	0.80	0.54 – 1.19	0.78	0.49 – 1.24	0.29
Use of traditional herbal drink										
No										
Yes	1.87	1.37 – 2.55	1.31	0.89 – 1.92	0.00*	1.19	0.84 – 1.67	1.56	1.06 – 2.30	0.02*
Chronic ingestion of alcohol										
No										
Yes	1.51	1.11 – 2.06	1.85	1.26 – 2.72	0.00*	1.20	0.80 – 1.80	1.37	0.87 – 2.15	0.17
Heavy smokers										
No										
Yes	1.47	0.98 – 2.21	2.41	1.53 – 3.80	0.00*	0.81	0.34 – 1.93	2.72	1.37 – 5.37	0.00*
Physical inactivity										
No										
Yes	0.84	0.58 – 1.21	0.22	0.15 – 0.33	0.34	0.60	0.422 – 0.86	0.21	0.14 – 0.31	0.00*
Sedentary living										
No										
Yes	0.70	0.49 – 1.00	0.67	0.43 – 1.06	0.09	1.63	1.15 – 2.30	1.02	0.68 – 1.55	0.92
High intake of fast foods										
No										
Yes	0.82	0.58 – 1.16	0.48	0.32 – 0.72	0.26	0.74	0.51 – 1.076	0.37	0.25 – 0.56	0.12

***p-value is significant at 0.05; **Low perceived susceptibility was used as the reference category; ***RRR-relative risk ratio**

Discussion

This study assessed the prevalence and risk-inducing lifestyles as well as perceived susceptibility of Nigerians resident in South-western Nigeria regarding KD risk. Based on the findings, the prevalent KD risk-inducing lifestyles were use of herbal medications, use of traditional herbal drink, chronic ingestion of alcohol, smoking, physical inactivity and sedentary living among the respondents by gender distribution. This was lower among the female respondents than the male counterparts and the prevalence observed in some earlier studies in Nigeria did not tally with this study findings[14,9,5]. The disparity may be attributed to sex differences in dietary habits, age and lifestyles. Socio-cultural and economic factors which preferentially favour males in Nigerian communities may also contribute to their increased risk-inducing lifestyles.

Efforts should be made to screen individuals with risk factors for KD signs and the results should be comprehensively interpreted to allow an informed decision. The effect of avoiding risk factors on KD progression to chronic kidney disease as well as end-stage renal disease should be stressed, as the majority of affected victims could not afford the cost of dialysis or renal replacement therapy (RRT)27. High prevalence of KD among patients is as a result of the problem of lack of screening and early detection and treatment which contributed to KD burden. Therefore, KD development or progression can be delayed if detected early as sequelae of other preceding chronic ailments progression (for example hypertension, diabetes and cardiovascular disease).

In agreement with previous studies[28,29], the respondents with adequate KD knowledge were found to indulge in risk-inducing lifestyles. This may be a reflection of KD denial or its associated risk factors and non-adherence to lifestyle modifications among the respondents, which are probable psychological and social aspects that could lead to poor health outcome and eventually natural progression of KD. Educational information should be tailored towards reduction of risk factors by adjusting lifestyle behaviour. For example, lifestyle behaviour such as use of medicines without medical doctors' prescription, herbal medications and traditional herbal drink should be discouraged. Nigerian studies have shown that herbal concoctions and medications are now a KD risk factor, which is one of the common causes of acute kidney injury[30,12] with increasing morbidity and mortality of affected victims.

This study showed a significant relationship between education and KD knowledge. There are some studies which revealed that educational status is likely to influence individuals to seek for knowledge on health matters[3,10]. The male respondents with education were found to have increased knowledge of KD risk-inducing lifestyles than their counterparts with no education. Knowledge of health matters influences an individual to avoid the risk factors and causes of KD development and progression. The reason for these apparent observations may be because knowledge affects informed decision towards KD ailments and such knowledge will guide the affected persons towards cues to actions or adopting preventive measures. Also, some studies directly linked poor awareness and knowledge of KD to KD development or progression[16,3,10]. Awareness facilitates easy communication that would lead to taking an informed decision and understanding of lifestyles modifications, early detection of KD and management, if one exists.

In addition, the demographic predictors of KD knowledge identified as an independent risk factors of KD among the respondents in this study were higher education, income, religion and urban setting. This is in line with the findings from previous studies that reported a positive association of demographic factors with KD risk[12,18]. The above-mentioned demographic factors were positively associated with KD knowledge and its risk, but some other studies have contrary findings[31,32]. The reason for these contradictory findings is not clear and so this contrary aspect demands further investigations.

Perceived susceptibility was low among the respondents by gender distribution, with slight increase among the female respondents. Factors such as age ≥30 years, male gender, sedentary living and poor diet were independently associated with greater odds of low perceived susceptibility, and this is in agreement with earlier studies[29,17,5]. The implication of this is that as the population ages, there is need to intensify health education interventions and screening strategies to detect high-risk persons with KD. The respondents with multiple risk factors, such as risk-inducing and bio-medical factors, had greater chances of KD occurrence or its progression. This corroborates previous hospital-based studies[14,17] and a similar study on misuse of medicines without medical doctors' prescription[25].

The respondents with lower perceived susceptibility were found to have increased risk-inducing lifestyles for KD risk. In reality, persons with adequate knowledge of KD and its risk factors should take precautionary measures towards KD risk. Low perceived susceptibility could be as a result of respondents not making themselves available for KD screening or health personnel are not communicating well KD and its risk factors to the general populace[33]. This is actually worth exploring in other studies to adequately have a first-hand information on how to stem the tide of CKD prevalence associated with increased morbidity and mortality of individuals.

Gender differences had a significant association with perceived susceptibility to KD risk in this study. This does not agree with the findings of many other studies, in which the male gender was reported to be a unmodifiable risk factor for KD[29]; while few studies have documented female prevalence of KD across Asia and Indian countries[34,35]. In particular, male gender with higher risk of KD may be attributed to their involvement in risky behaviours as well as in predisposing biomedical factors. Studies[10,29] have revealed that actuals risks is being facilitated in controlling KD encouraging preventive actions for individuals at high risk.

However, the assumed impact of KD perceived risk is to stimulate behavioral modifications to prevent, detect, and manage KD in cases other than being in a condition of complying with stringent health requirements[36,37]. Thus, perceived risks are interconnected with impetus to act and to action, which have higher equal odds between perceived risks (beliefs) and actual risk (reality). Hence, individuals will understand the health implications of KD risk factors and begin to evaluate their personal health risks towards KD.

Several hospital-based studies have reported an association between sedentary living with poor diets and perceived susceptibility to KD among CKD-diagnosed patients[29,36-38]. On the contrary, a Nigerian study found an association in multivariate analysis between the presence of use of pain analgesics, use of herbal medications, chronic ingestion of alcohol and high intake of fast foods risk factors and gender distribution with respect to perceived susceptibility to KD risk[3,39].

Limitations

The cross-sectional nature where respondents were visited only once during data collection and knowledge of KD, was also self-reported. Also, in view of the cross-sectional nature of this study, further prospective studies about the association between perceived susceptibiity to KD risk and progression of kidney function could be done. The strengths of this study are the multi-stage random sampling method, and, to a large extent, a good coverage of the community where the study was carried out. Also, content and concurrent validity was employed in designing the knowledge and perception questions in order to validate this study outcomes[3,14,16].

Conclusion

Knowledge of kidney diseases (KD) and prevalence of risk-inducing lifestyles was high among the male folks in the community, while perceived susceptibility by gender distribution was low. The independent risk factors for KD reported included old age, use of herbal medications, traditional herbal drink, chronic ingestion of alcohol and smoking. Based on the outcome of this study, we recommend that concerted effort should be made to improve the development of well-structured health education programmes in the community to produce a better understanding of KD burden and its related risk factors. Urgent attention needs to be paid to the risk factors for KD and to introduce preventive interventions to slow KD progression in Nigerian communities. Kidney disease should be discussed in the clinic with persons with multiple risk factors (lifestyles and biomedical factors). Screening programmes should incorporate more awareness talks on the disease, especially communities with limited knowledge of KD risk factors. For those diagnosed with KD, dialysis and renal transplantation therapy should be encouraged in those that can support the treatment. Above all, preventive health programmes should be targeted in all grassroots' communities.

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