

Original Research Article

Assessment of patients' knowledge on chronic kidney disease in selected health facilities in Delta State, Nigeria

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Abstract

Purpose: To evaluate the knowledge of patients about chronic kidney disease (CKD) and to determine the impact of sociodemographic characteristics on the knowledge of the respondents.

Methods: A prospective, cross-sectional study was conducted in the Renal Unit of Warri Central Hospital Outpatient Medical Department and the Nephrology Department of Delta State University Teaching Hospital (DELSUTH), Oghara, both in Delta State, Nigeria, over a period of 1 year. Data was collected using a 28-item questionnaire from the kidney disease knowledge survey (KiKS). Student's t-test was performed to investigate the relationship between respondents' knowledge and sociodemographic variables.

Results: A total of 182 patients participated in the study. The overall mean knowledge score for respondents from Central Hospital, Warri and DELSUTH Oghara was 16.25 ± 2.84 and 15.73 ± 4.96 , respectively. The difference in knowledge score concerning facility, sex, marital status and age was not statistically significant ($p > 0.05$).

Conclusion: The knowledge of kidney disease patients about chronic kidney disease based on KiKS was poor. There is a significant knowledge deficit related to misconceptions in patients' understanding of medications to avoid in patients with this condition and the deleterious effects of proteinuria. No statistically significant relationship could be established between sociodemographics and knowledge. There is a need to enlighten patients about the pathology, diagnosis, and prognosis of chronic kidney disease.

Keywords: Chronic kidney disease, Sociodemographic, Nephrology, Kidney disease knowledge survey

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INTRODUCTION

Chronic kidney disease (CKD) is a progressive disease with a high potential for mortality and has become a global public health problem [1,2]. The causes are myriad and include autoimmune factors, and prolonged use of analgesics, Lead, and anti-neoplastic agents. Others are systemic

lupus erythematosus (SLE), hypertension and hyperglycemia leading to hypertensive and diabetic nephropathy [3]. Prominent among the causes of end-stage renal disease (ESRD) in developing countries like Nigeria are hypertension and diabetes [4]. Estimates projected a 130 % increase in prevalence of

hypertension and diabetes by 2020, with corresponding increase in CKD and ESRD [5].

Irrespective of therapeutic approach, achieving positive outcomes relating to slowing disease progression depends largely on good self-care strategies, especially adherence to drug therapy [6-8], discontinuation of exposure to nephrotoxic assaults [9], and adherence to strict diet [10].

Previous studies have established that better outcomes are more likely when the aforementioned measures are combined with hemodialysis [11], improved glycemic control in patients with diabetes [12,13], and greater adherence to antiretroviral medications in patients with HIV [14]. The study objectives were to evaluate kidney disease patients' knowledge about chronic kidney disease and to determine the impact of sociodemographic characteristics on the knowledge of the respondents.

EXPERIMENTAL

Study design and setting

This study was a prospective, cross-sectional study conducted over a period of one year. The study was undertaken in the Renal Unit of the Warri Central Hospital, Outpatient Medical Department, and the Nephrology Department of Delta State University Teaching Hospital, Oghara, in Delta State, Nigeria. Both hospitals are referral centers for patients with kidney-related conditions in Delta State, thus affording a representative sampling of patients with chronic kidney disease.

Inclusion criteria

All adult patients diagnosed with chronic kidney disease and attending the renal clinic in the two health care facilities were included in the study.

Exclusion criteria

Patients who were too sick to participate in the study were excluded.

Sample size and sampling technique

All the consenting patients who met the inclusion criteria were consecutively recruited during the study period.

Ethical consideration

Ethical approval was obtained from the ethics committee of the two hospitals before the study commenced (DELSUTH/HREC/2017/012/0236

dated 01/03/2017 for DELSUTH and CHW/ECC VOL 1/086 dated 05/04/2016 for Central Hospital Warri).

Instrument of data collection

Data was collected using a 28-item questionnaire from the kidney disease knowledge survey (KiKS) designed by a team of clinical researchers at the Vanderbilt University Medical Center. The questionnaire had three sections; the first section comprised general knowledge of kidney disease, the second was the knowledge of the function of kidney disease, while the third section assessed the patient's knowledge of symptoms of disease progression. Some of the questions elicited a yes or no response, while others were multiple-choice questions. The questionnaire has good reliability (Kuder-Richardson-20 = 0.72) and evaluates the knowledge of the respondents with a maximum score of 28.

Data analysis

The data were analysed using the Statistical Package for Social Sciences (SPSS) version 20.0 (IBM Corp., NY, USA). The various variables were expressed as simple frequencies and percentages. Student's t-test was used to investigate the relationship between respondents' knowledge and sociodemographic variables. Statistical significance was set at $P < 0.05$.

RESULTS

The patients who participated in the study were 182. The mean age of the respondents was 51.3 ± 16.6 years. The majority were women (97; 53 %), married (150; 82.4 %), neither drank alcohol (154; 84.6 %) nor smoked (168; 92.3 %). Other demographics are shown in Table 1.

The overall mean knowledge score of the respondents from Central Hospital, Warri, and DELSUTH, Oghara was 16.25 ± 2.84 and 15.73 ± 4.96 , respectively. There were no statistically significant differences in knowledge scores about facility, sex, marital status, and age ($p > 0.05$; Table 3).

From the KiKS, two items had the lowest scores; item 3 which evaluated "the reason why the presence of protein in urine is a problem", only 37 (20.8 %) respondents chose the right answer, and item 4 which assessed "the medications that a person with chronic kidney disease should avoid", only 41 (23 %) respondents chose the correct medications. This indicates a knowledge gap in comprehending the clinical importance of

proteinuria and drug safety in CKD. The item with the highest percentage score examined “if increased fatigue is a symptom of chronic kidney disease progression or failure”; 175 (98.3 %) respondents answered correctly, showing strong recognition of the symptoms of CKD (Table 2).

The relationship between socio-demography and the knowledge of respondents was not significant (Table 4). However, in the analysis by facility, there was a significant relationship between gender and knowledge of respondents at Warri Central hospital (Table 5).

DISCUSSION

The study revealed that respondents exhibited a low level of knowledge about chronic kidney disease according to the KiKS. Their mean KiKS score was lower than the expected mean score of 18.48 as established by the developers of the KiKS questionnaire in a U.S. study [15]. This discovery implies a substantial deficit in chronic kidney disease-related knowledge. Most respondents were not aware of the recommended average value of their blood pressure, reflecting the quality of education and advice provided by their nephrologists and pharmacists. Furthermore, the KiKS item most frequently answered correctly was the question on whether the progression of chronic kidney disease leads to increased fatigue. This may be

rationalized by the patients' experiences, as fatigue worsens with disease progression.

Interestingly, despite ongoing counseling regarding medications to avoid, particularly the non-steroidal anti-inflammatory drugs (NSAIDs), most respondents failed to identify NSAIDs as detrimental. This observation is consistent with the findings of some related studies [16-18].

Many respondents poorly understood the role of the kidney in bone formation, consistent with the findings of Wienman *et al* [19], who reported minimal knowledge of organ structure and function. Furthermore, more than half of the respondents did not understand kidney's role in anaemia in CKD patients. In previous studies, a lack of understanding of the functions of the major organs has been established [19]. Only a small percentage of respondents correctly answered that chronic kidney disease may progress without symptoms. This is a major gap, as asymptomatic progression may lead to advanced stages of the disease before detection [15]. This is in accordance with previous studies that reported analogous misconceptions [15,20-22].

There was no significant association between age and knowledge of chronic kidney disease, which is inconsistent with Tan *et al* [23], who reported younger age as a predictor of greater knowledge among stage 3-4 chronic kidney disease patients.

Table 1: Socio-demographics of respondents

Item	Sub-item	Frequency	Percentage
Center	Central Hospital, Warri	102	56
	DELSUTH	80	44
Sex	Male	85	46.7
	Female	97	53.3
Marital status	Single	30	16.5
	Married	150	82.4
	Divorced	2	1.1
Occupation	Student	16	8.9
	Tailoring	8	4.5
	Civil Servant	41	22.9
	Trading (Business)	69	38.5
	Farming	2	1.1
	Contractor	3	1.6
	Plumbing	2	1.1
	Pensioner	41	22.9
Educational background	Primary	57	31.3
	Secondary	62	34.1
	Tertiary	63	34.6
Alcohol	No	154	84.6
	Yes	28	15.4
Smoking	No	168	92.3
	Yes	14	7.7
Total		182	100.0

Table 2: Knowledge of kidney disease by respondents

Item	General knowledge	Response	Central Hospital		DELSUTH		Total	
			Freq	%	Freq	%	Freq	%
1	BP goal	Wrong	81	79.4	30	39.5	111	62.4
		Correct	21	20.6	46	60.5	67	37.6
2	Medication important to kidney health	Wrong	10	9.8	2	2.6	12	6.7
		Correct	92	90.2	74	97.4	166	93.3
3	Reason why protein in urine is a problem	Wrong	83	81.4	58	76.3	141	79.2
		Correct	19	18.6	18	23.7	37	20.8
4	Medications a person with CKD should avoid	Wrong	69	67.6	68	89.5	137	77.0
		Correct	33	32.4	8	10.5	41	23.0
5	Treatment options for kidney failure	Wrong	69	67.6	32	42.1	101	56.7
		Correct	33	32.4	44	57.9	77	43.3
6	Definition of GFR	Wrong	21	20.6	32	42.1	53	29.8
		Correct	81	79.4	44	57.9	125	70.2
7	Knowing there are stages of CKD	Wrong	21	20.6	10	13.2	31	17.4
		Correct	81	79.4	66	86.8	147	82.6
8	Understanding increased risk of heart disease	Wrong	18	17.6	36	47.4	54	30.3
		Correct	84	82.4	40	52.6	124	69.7
9	Understanding increased risk of mortality	Wrong	39	38.2	12	15.8	51	28.7
		Correct	63	61.8	64	84.2	127	71.3
Knowledge of kidney function								
10	Role in urine production	Wrong	7	6.9	14	18.4	21	11.8
		Correct	95	93.1	62	81.6	157	88.2
11	Role in waste clearance	Wrong	33	32.4	6	7.9	39	21.9
		Correct	69	67.6	70	92.1	139	78.1
12	Role in bone health	Wrong	44	43.1	42	55.3	86	48.3
		Correct	58	56.9	34	44.7	92	51.7
13	Role in hair loss	Wrong	60	58.8	20	26.3	80	44.9
		Correct	42	41.2	56	73.7	98	55.1
14	Role in anemia	Wrong	66	64.7	36	47.4	102	57.3
		Correct	36	35.3	40	52.6	76	42.7
15	Role in BP control	Wrong	32	31.4	32	42.1	64	36.0
		Correct	70	68.6	44	57.9	114	64.0
16	Role in glucose control	Wrong	64	62.7	32	42.1	96	53.9
		Correct	38	37.3	44	57.9	82	46.1
17	Role in potassium control	Wrong	35	34.3	44	57.9	79	44.4
		Correct	67	65.7	32	42.1	99	55.6
18	Role in Phosphorus control	Wrong	44	43.1	44	57.9	88	49.4
		Correct	58	56.9	32	42.1	90	50.6
Knowledge of symptoms of progression or failure								
19	Increased fatigue	Wrong	3	2.9	0	0.0	3	1.7
		Correct	99	97.1	76	100.0	175	98.3
20	Shortness of breath	Wrong	34	33.3	50	65.8	84	47.2
		Correct	68	66.7	26	34.2	94	52.8
21	Metallic/bad taste	Wrong	42	41.2	40	52.6	82	46.1
		Correct	60	58.8	36	47.4	96	53.9
22	Unusual itching	Wrong	58	56.9	28	36.8	86	48.3
		Correct	44	43.1	48	63.2	92	51.7
23	Nausea/vomiting	Wrong	56	54.9	44	57.9	100	56.2
		Correct	46	45.1	32	42.1	78	43.8
24	Hair loss	Wrong	58	56.9	20	26.3	78	43.8
		Correct	44	43.1	56	73.7	100	56.2
25	Difficulty sleeping	Wrong	29	28.4	28	36.8	57	32.0
		Correct	73	71.6	48	63.2	121	68.0
26	Weight loss	Wrong	13	12.7	34	44.7	47	26.4
		Correct	89	87.3	42	55.3	131	73.6
27	Confusion	Wrong	40	39.2	22	28.9	62	34.8
		Correct	62	60.8	54	71.1	116	65.2
28	No symptoms at all	Wrong	70	68.6	54	71.1	124	69.7
		Correct	32	31.4	22	28.9	54	30.3

Table 3: Distribution of patients on KiKS

Variable	Sub-variable	General Knowledge Score (Mean±SD)
Center	Central Hospital, Warri	16.25 ± 2.84
	DELSUTH	15.73 ± 4.96
Sex	Male	15.65 ± 3.47
	Female	16.34 ± 4.25
Marital Status	Single	16.13 ± 3.47
	Married	15.99 ± 4.03
	Divorced	16.00 ± 0.00
Occupation	Student	17.75 ± 2.84
	Tailoring	13.63 ± 5.66
	Civil Servant	15.78 ± 4.46
	Trading (Business)	15.84 ± 3.48
	Farming	13.00 ± 0.00
	Contractor	11.00 ± 0.00
	Plumbing	15.00 ± 0.00
	Pensioner	16.90 ± 3.80
Educational Background	Primary	16.73 ± 2.64
	Secondary	12.33 ± 5.32
	Tertiary	15.68 ± 4.43

Table 4: Relationship between respondents' characteristics and KiKS

Variable	Sub-variable	Knowledge score N	Mean±SD	t-test	P-value
Center	Central Hospital, Warri	102	16.25±2.84	0.890	0.375
	DELSUTH	80	15.73±4.96		
Sex	Male	85	15.65±3.47	-1.194	0.234
	Female	97	16.34±4.25		
	Total	182	16.02±3.91		
Marital Status	Single	30	16.13±3.47	0.177	0.859
	Married	150	15.99±4.03		
	Divorced	2	16.00±0.00		
	Total	182	16.02±3.91		
Age		182	51.25±6.61	0.128	0.086
Educational background	Primary	57	16.73±2.64	0.165	0.826
	Secondary	62	12.33±5.32		
	Tertiary	63	15.68±4.43		
	Total	182	16.02±3.91		

Table 5: Relationship between patient characteristics and KiKS by centers (Mean knowledge score)

Variable	Sub-variable	Central Hospital, Warri			DELSUTH		
		Mean	SD	t-test (P-value)	Mean	SD	T-test (p-value)
Sex	Male	15.56	2.28	-2.682 (0.009)	15.81	4.94	0.116(0.908)
	Female	17.02	3.21		15.67	5.02	
	Total	16.25	2.84		15.72	4.96	
Marital status	Single	15.91	3.60	-0.625 (0.533)	16.75	3.24	0.611(0.543)
	Married	16.34	2.61		15.60	5.19	
	Divorced				16.00	.00	
	Total	16.25	2.84		15.72	4.96	

Similarly, there was no association between CKD knowledge and marital status or gender; this aligns with findings from a U.S. study [24]. In the same vein, there was no significant relationship between educational level and CKD knowledge, which contrasts with Okoro *et al* [25] who reported level of education as a predictor of CKD knowledge.

CONCLUSION

The level of knowledge of chronic kidney disease (CKD) among patients, as assessed using the Kidney Disease Knowledge Survey (KiKS), was generally low. Marked deficiencies were identified, particularly regarding medications that should be avoided in CKD and the clinical significance of proteinuria.

No statistically significant association was found between socio-demographic characteristics and CKD knowledge, indicating that knowledge gaps are pervasive across patient groups. These findings underscore the urgent need for comprehensive and structured educational interventions targeting all patients with CKD.

DECLARATIONS

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Ethical approval

Ethical approval was obtained from the ethics committee of the two hospitals before the study commenced (DELSUTH/HREC/2017/012/0236) dated 01/03/2017 for DELSUTH and CHW/ECC VOL 1/086 dated 05/04/2016 for Central Hospital Warri.

Use of Artificial intelligence/Large language models

The authors confirm that AI-based tools were used solely for language editing and manuscript polishing purposes (e.g., grammar, phrasing, and clarity). No AI tools were used to generate content, interpret data, or influence study design, results, or conclusions. All intellectual contributions, study analyses, and interpretations reported in the manuscript are the original work of the authors.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of interest

No conflict of interest is associated with this work.

Contribution of authors

We declare that this work was done by the author(s) named in this article, and all liabilities pertaining to claims relating to the content of this article will be borne by the authors. Ogheneovo Clement Aghoja and Valentine Uche Odili conceived and designed the study. Data collection was done by Ogheneovo Clement Aghoja. The data was analyzed by David Ufuoma Adje, who also supervised the work. Ogheneovo Clement Aghoja and Ufuoma Shalom Ahwinahwi prepared the manuscript. The manuscript was reviewed by Valentine Uche Odili, and all the authors read and approved the final manuscript.

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