KNOWLEDGE, ATTITUDE AND PRACTICE OF UNDERGRADUATE STUDENTS FROM HEALTH-BASED FACULTIES ON KIDNEY HEALTH

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ABSTRACT

Since the significant rise in the incidence of important risk factors of kidney diseases, kidney health has become an issue of public health concern and priority, especially in low and middle-income countries like Nigeria. A cross-sectional survey was conducted using a 34-item paper-based questionnaire. Three health-based faculties were conveniently selected from which three departments were purposely chosen in a Nigerian university. A total of 773 responses were obtained and a mean percent knowledge score of the entire study population was 74.60±12.38. The mean attitude score of the entire study population was 27.28±3.00 (possible maximum score = 36) and a mean practice score of 4.74±0.72 (possible maximum score = 5) was obtained for the entire respondents. Moderate number of students demonstrated high knowledge level and positive attitude towards kidney health. Among the three sub-themes assessed, the students demonstrated the highest percentages in good practices towards kidney health. There is need to enhance practical exposures to disease-settings and improve teaching curricula.

INTRODUCTION

The renal system consists of the kidney, ureters, and the urethra. The system filters approximately 200 liters of fluid a day from renal blood flow which allows for toxins, metabolic waste products, and excess ion to be excreted while keeping essential substances in the blood [1]. The kidney regulates plasma osmolarity by modulating the amount of water, solutes, and electrolytes in the blood. It ensures long term acid-base balance, carries out the conversion of vitamin D to its active form. It also produces erythropoietin for stimulation of the production of red blood cell and renin for blood pressure regulation [2,3].

Since the significant rise in the incidence of important risk factors of kidney diseases, such as diabetes mellitus, hypertension, poor diet, little or no physical exercise, and metabolic syndrome, kidney health and diseases have become global public health issues [4, 5]. Kidney diseases have been ranked as the world's 12th and 17th leading causes of death and disability respectively with an estimated overall global prevalence of 8%–16%. This corresponds to

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over 850 million affected individuals, of whom more than 78% reside in low-income to middle-income countries (LMICs)- where incidence rates are cited to be up to four times higher than those observed in developed countries [5-9]. The burden of kidney diseases in developing countries is substantially greater due to additional hazards associated with poverty, such as infections, hazardous job, inadequate education, and poor maternal health, as well as the expense of screening and treatment, thus resulting in an eight to tenfold elevation in the occurrence of kidney failure, cardiovascular disease (CVD), and early death amongst CKD patients [4, 10, 11]. In addition to these complications are acute kidney injury, anemia, mineral and bone disorders, fractures, hospitalizations and significant financial burden [5, 7, 12].

The ultimate goal of kidney disease management is to prevent disease progression, minimize complications, and promote quality of life. Management includes reducing the patient's risk of CKD progression and risk of associated complications [9, 13]. Public and healthcare provider awareness and understanding are critical aspects in kidney health and kidney disease preventive and screening programs' success as whereby early detection and management can help prevent disease progression in its early stages [5, 11, 14, 15]. Alongside patient care, research and advocacy; adequate education of undergraduate, graduate and continuing practitioners, have been identified as core building blocks and supporting legs to the kidney disease management [14,16] Frontline healthcare workers- Physicians (Nephrologists, Cardiologists, etc.), Pharmacists and Nurses, significantly contribute to the effective prevention, diagnosis and management of kidney diseases as they often see and relate to kidney disease patients first, last, and in between, ambulatory care, appointments, emergency departments, or inpatient settings [17, 18]. Thus, the need to assess the knowledge, attitude and practice of the future front-line health care practitioners. This study was therefore designed to assess the knowledge, attitude and practices towards kidney health among undergraduates in a Nigerian tertiary institution.

METHODS
Study Design
This study was a cross sectional survey conducted in three health-based departments of the University of Nigeria, Nsukka.

Study Setting
The study was carried out in health-related departments among students in their final and penultimate years.

The University of Nigeria (UNN) is a federal University located in Nsukka, Enugu State, Nigeria. It was founded by Nnamdi Azikiwe in 1955 and formally opened on 7 October 1960, the University of Nigeria has four campuses – Nsukka, Enugu, and Ituku-Ozalla – all located in Enugu State and Aba campus in Abia State. The University of Nigeria was the first full-fledged indigenous and first autonomous university in Nigeria, modeled upon the American educational system. It is the first land-grant university in Africa and one of the five universities in Nigeria with the highest reputation [19 - 21].

Enugu is a state in southeastern Nigeria, created in 1991 from part of the old Anambra State. It is home of the Igbo of southeastern and few Idoma/Igala people in Ette (Igbo-Eze North) of Enugu State, Nigeria. A significant portion of the people of Enugu adhere to Christianity with small groups adhering to African traditional religion known as 'Omenani', or are irreligious or atheist [22].

Sample Size and Selection
The sampling frame, a list of all the health-based departments in the University of Nigeria was obtained from the University of Nigeria website (http://unn.edu.ng/about/founding-university).

Penultimate and ultimate level students from the departments of medicine, pharmacy and nursing were conveniently selected for this study as these three departments represent the major groups of health practitioners that have the most contact with patients with kidney diseases [23]).

Study Instrument
A standard questionnaire was developed for the study. The content of the instrument was obtained through rigorous search of literatures. Content validation was done by experienced academic staff of the Faculty of Pharmaceutical Sciences, while face validation was done by students of a department that were not involved in the final study. The questionnaire was divided into four sections – a sociodemographic section, a 20-item knowledge section, a 9-item attitude section and a 5-item practice section.

Study Procedure
All the students in these levels of study who were available on a chosen day of lecture were approached to fill the questionnaire. The developed and validated questionnaire was transformed into a

printed paper and distributed among the selected students.

Data Management and Analysis
Responses were transferred from the filled questionnaires into Microsoft Excel; the collated data were cleaned and eligible responses were exported into SPSS Version 25 for analysis. Frequencies, percentages, mean and standard deviations were used to describe the variables. Each correct answer for the knowledge items was scored one and incorrect answers scored zero. The same scoring of one (for correct practice) and zero (for incorrect practice) was also used for the practice section. The attitude section responses utilized a 4-likert scale, scored 1 to 4. Each negatively worded item was reversely scored. The total median score for all the respondents were used as a cut-off point to categorize each respondent as having either good or poor knowledge, positive or negative attitude, and good or poor practice. Chi-Square was used to determine associations between the demographic characteristics and the different categories of the dependent variables (knowledge, attitude and practice). Any *p-value* less than 0.05 was considered statistically significant.

Ethical Consideration
Participation in this study was completely voluntary. Informed consent was obtained as a prerequisite to participate in the study. All information obtained from the participants were handled with confidentiality. No identifier characteristics were sought from them. Ethical clearance was obtained from the Research and Ethics Committee of the University of Nigeria, Nsukka (REF NO: *FPSRE/UNN/22/0006*).

RESULTS
Socio-Demographic Characteristics of Respondents
A total of 773 responses were retrieved. Respondents had the following socio-demographic data: 494 (64.4%) were aged between 22-25 years, 419 (54.3%) were females and 445 (57.6%) were in 500 level of study. Table 1 contains detailed information on the socio-demographic data of the respondents.

Respondents Knowledge on Kidney Health
A total of 455 (58.9%) respondents had good knowledge of kidney health (Figure 1). Most of the respondents had correct knowledge on the following questions; 758 (98.1%) on the manifestations of kidney disease, 730 (94.4%) on the use of urine in

the determination of kidney health and 731 (94.6%) on water retention (oedema) being a sign/symptom of advanced kidney disease. Few respondents had the right knowledge about blood pressure measurement (125, 16.2%) not being a test to determine kidney health and on stress (164, 21.2%) not being a major risk factor for kidney disease. A detailed table of the knowledge on kidney disease is shown in Table 2.

Respondents' Attitude to Kidney Health
Respondents had mean attitude scores of 3.43 ± 0.55 towards advanced kidney failure being fatal if not treated, 3.45 ± 1.31 towards CKD patients taking herbal medicines and 2.00 ± 0.92 towards not adjusting the doses of drugs excreted through the kidney in order to prevent toxicities, Table 3. Generally, 361 (47.8) of the respondents had negative attitude towards kidney health (Figure 1).

Students' Practice towards Kidney Health
Respondents had a positive practice on periodic screening for selection of CKD (764, 98.8%), and maintaining a normal/healthy body mass index (BMI). Respondents who had a practice of seeking care from a traditional healer were a total of 47(6.1%), Table 4.

Association between Students' Socio-demographic variables and High knowledge, Positive Attitude, and Good Practices
The respondents who had significant association with high knowledge of kidney health were the males (221, 62.8%) (p = 0.030). A significant association was found between positive attitude and respondents aged 18-21 years (111,74.0%) (p = 0.00001), single marital status (342, 50.4%) (p = 0.001), male respondents (234, 57.2%) (p = 0.02) and the department of Pharmacy (257, 55.3%) (p = 0.032). The male respondents (306, 88.2%) also had significant association (p = 0.07) with good practice towards kidney health, Table 5.

DISCUSSION
Significant limitations have been reported in the knowledge of kidney health and disease among frontline healthcare workers, especially in the implementation of current treatment strategies and guidelines [11, 24]. This study, however, reported quite a moderate proportion with high knowledge of kidney health. In this study, students demonstrated excellent knowledge (> 90%) in the physiology of the kidney, manifestations of kidney disease, the use of urine in determining kidney health, diabetes as risk

Table 1: Socio-demographic variables of the students

Variables	Frequency	Percentage (%)
Age		
18 - 21 Years	152	19.8
22 – 25 Years	494	64.4
26 - 30 Years	115	15.0
> 30 Years	6	0.8
Sex		
Male	352	45.7
Female	419	54.3
Marital Status		
Single	696	90.3
Married	64	8.3
Engaged	11	1.4
Religion		
Christianity	758	98.1
Traditional Religion	5	0.6
Others	7	0.9
Level of Study		
400 Level	286	37.0
500 Level	445	57.6
600 Level	42	5.4
Department		
Pharmacy	476	61.6
Medicine	146	18.9
Nursing	151	19.5

Table 2: Students' Knowledge of kidney health

Questions	Correct Answers (N = 773) n (%)
1. A person can lead a normal life with one healthy kidney.	703 (90.9)
2. Kidney disease can manifest as either an acute or a chronic disease.	758 (98.1)
3. Kidney produces urine to cleanse the body of waste products.	712 (92.1)
The following are tests/evaluations commonly used to determine the health of your kidneys EXCEPT	
4. A blood test	645 (83.4)
5. A urine test	730 (94.4)
6. A faecal (stool) test	371 (48.0)
7. Blood pressure monitoring.	125 (16.2)
Risk factors for chronic kidney disease includes:	
8. Diabetes	698 (90.3)
9. High blood pressure	671 (86.8)
10. Heart problems such as heart failure or heart attack	677 (87.6)
11. Stress	164 (21.2)
Risk Factors for kidney disease include:	
12. High Body Mass Index (BMI)/Obesity	625 (80.9)
13. Chronic/frequent NSAID use	646 (83.6)
14. Significant consumption of herbal medicines	674 (87.2)
The signs and symptoms that a person might have if they have advanced chronic kidney disease or kidney failure include:	
15. Water retention (edema)	731 (94.6)
16. Fever	372 (48.1)
17. Nausea/vomiting	393 (50.8)
18. Reduction in urination	723 (93.5)
Possible treatments for a person that have kidney disease include:	
19. Dialysis is a major form of treatment for advanced kidney disease.	708 (91.6)
20. Antibiotics are a major form of treatment for kidney disease.	376 (48.6)

Table 3: Students' Attitude towards Kidney Health

Attitude of the Respondents	Mean ± SD
Presentation	
Chronic kidney disease (CKD) may not have any symptom until advanced.	2.70 ± 0.743
Treatment	
Early detection and treatment of CKD does **NOT** affect the progression nor risk of untimely deaths from kidney disease.	2.73 ± 0.962
CKD patients should **NOT** take herbal medicines.	3.45 ± 1.313
It is NOT necessary to adjust doses of any drug excreted through the kidney in order to prevent toxicities.	2.00 ± 0.923
Economic Impact	
Kidney failure treatment costs are more than that for kidney screening.	3.23 ± 0.736
Kidney disease may affect a person's ability to work or their productivity.	3.24 ± 0.728
Health Implications	
Patients with kidney disease would be worried about their chances of survival.	3.27 ± 0.566
Advanced Kidney failure may be fatal if not treated by dialysis or kidney transplant.	3.43 ± 0.550
Social Impact	
Kidney disease is a major health problem in Nigeria.	3.19 ± 0.638

Key: SD = Standard deviation, CKD = Chronic Kidney Disease

Table 4: Potential practice recommendations towards kidney health

Practice	Correct practice (%)
Periodic screening for selection of CKD, especially for people with significant risk factors.	764 (98.8)
Seek care from a traditional healer.	47 6.1)
Seek care from a hospital.	721 (93.3)
Maintain a normal /healthy body weight/BMI.	725 4.0)
Reduce salt intake.	712 (93.0)

CKD = Chronic Kidney Disease

Table 5: Association between students' socio-demographic variables and high knowledge, positive attitude, and good practices towards kidney health

Variables	High Knowledge n (%)	p	Positive Attitude n (%)	P	Good Practice n (%)	p
1. Age						
18 – 21 Years	86 (56.6)	0.218	111 (74.0)	**0.00001***	115 (78.2)	0.064
22 – 25 Years	287 (58.1)		239 (49.9)		415 (85.2)	
26 – 30 Years	78 (67.8)		36 (31.9)		102 (88.7)	
>30 Years	3 (50.0)		3 (50.0)		6 (100.0)	
2. Gender						
Male	221 (62.8)	**0.030***	160 (46.5)	**0.002***	306 (88.2)	**0.007***
Female	234 (55.8)		234 (57.2)		336 (81.6)	
3. Marital Status						
Single	401 (57.6)	0.135	342 (50.4)	**0.001***	575 (84.1)	0.277
Married	45 (70.3)		41 (65.1)		56 (87.5)	
Engaged	7 (63.6)		11 (100.0)		11 (100.0)	
4. Religion						
Christianity	441 (58.2)	**0.014***	383 (51.8)	0.059	629 (84.3)	0.329
Traditional Religion	5 (100.0)		5 (100.0)		5 (100.0)	
Others	7 (100.0)		7 (100.0)		7 (100.0)	
5. Level of Study						
400 level	170 (59.4)	0.486	149 (54.2)	0.081	233 (82.9)	0.545
500 Level	264 (59.3)		230 (52.5)		374 (85.4)	
600 level	21 (50.0)		15 (35.7)		37 (88.1)	
6. Department						
Pharmacy	286 (60.1)	0.075	257 (55.3)	**0.032***	393 (84.0)	0.712
Medicine	92 (63.0)		74 (51.7)		125 (86.8)	
Nursing	77 (51.0)		63 (42.9)		126 (84.6)	

* Association is significant at < 0.05 level.   Key p = Pearson chi square

	KNOWLEDGE	ATTITUDE	PRACTICE
GOOD/POSITIVE	58.9	52.2	83.3
BAD/NEGATIVE	41.1	47.8	15.1

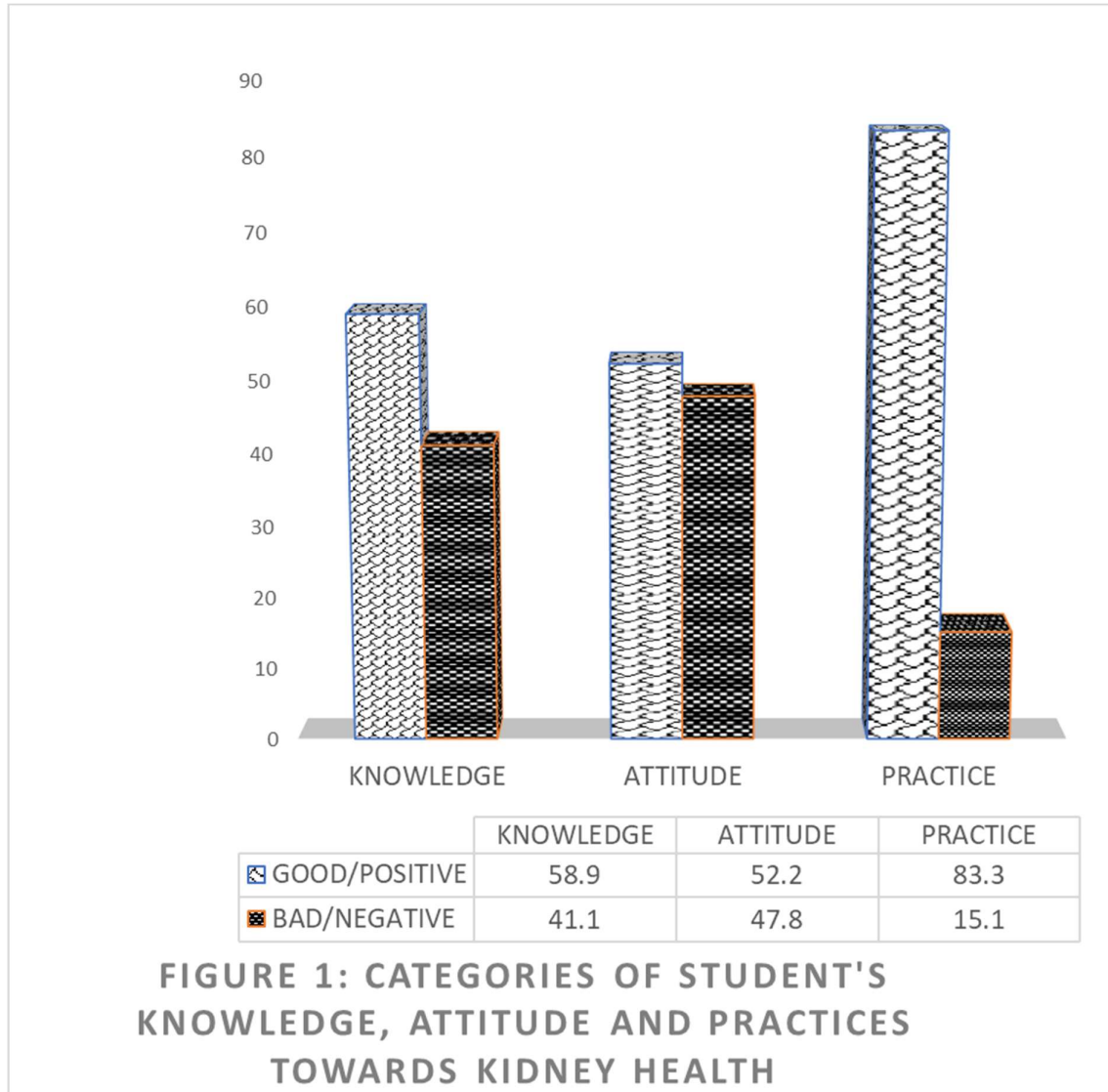FIGURE 1: CATEGORIES OF STUDENT'S KNOWLEDGE, ATTITUDE AND PRACTICES TOWARDS KIDNEY HEALTH

Figure 1: Categories of student's knowledge, attitude and practices towards kidney health

factor for CKD, water retention and reduction in urination as signs/symptoms of advanced kidney disease, and dialysis as a major form of treatment for kidney disease. This was similar to the results of a cross sectional study on the knowledge of chronic kidney disease among health-related students in Jimma University, where over half of the students that participated in the survey were aware of the roles of the kidney in the human body, the early symptoms and potential risk factors of kidney diseases [25]. This close similarity may stem from the curricula used in training health-related students as the anatomy, physiology and pathophysiology of the kidneys are introduced from the early stages till the advanced stages of their study, thus providing adequate theoretical basis for a thorough understanding of kidney function [26, 27].

Respondents showed a fair knowledge on the use of blood in determining kidney health and on all listed risk factors for kidney disease, except stress which they erroneously thought was a major cause of kidney disease. Also, poor knowledge was shown on the use of faeces in determining kidney health, fever and nausea/vomiting as signs/symptoms of advanced CKD or kidney failure and the use of antibiotics as a major form of treatment for kidney disease. The knowledge items with the lowest proportion of students with correct answers were on the use of blood pressure monitoring in determining kidney health and on excess stress being a risk

factor for kidney disease. This observation was also similar to the results of the investigation of Wolide *et al* [25] where more than half of the students sampled had wrong information related to CKD diagnosis methods, no information about the role of estimated glomerular filtration rate (eGFR) in assessing the severity and function of the kidney and poor knowledge on the treatment option of kidney transplantation in end stage CKD. These trends were as expected, since the diagnosis and treatment of kidney disease largely depends on practical field experiences not merely on theoretical basis [28]. Furthermore, this clearly elucidates the need for more exposure of health-related students to curricula content on diagnosis, treatment and management of kidney disease to better prepare them for the complex and multifaceted management of kidney diseases.

The student had a positive mean attitude against the use of herbal medicine in treatment of CKD.A stark contrast is seen between the investigation of Wolide *etal* [25] and this study where a high mean attitude was found in the attitude of the respondents towards the economic impact, the health implications and social impact of kidney disease; with the highest mean attitude demonstrated in the attitude of respondents towards the use of herbal medicines by CKD patients. In Wolide *et al.'s* study among health-related students in Jimma University, Ethiopia [25], more than half of the students did not believe that CKD is a major health problem in Ethiopia and did not believe the myth that being a CKD patient could lead to death from any cause.

Among the three themes, knowledge, attitude and recommended practices towards kidney health, the students demonstrated the highest percentages in good practices towards kidney health. Most of the respondents will recommend good practices in the area periodic screening for detection of CKD-especially for people with significant risk factors, maintaining a normal/healthy body weight/BMI, seeking care from the hospital and reduction of salt intake. These observations demonstrate the readiness of health-related students to actively contribute their quota to the provision of better kidney health in their practice settings if they are equipped with the adequate knowledge, training exposure and resources, hence an effective strategy to closing the gaps in kidney care, research and policies [11].

However, respondents showed very poor practice recommendation for patients to seek care from traditional healers. This may be due to the proliferation of many unverified herbal substances in low- and middle-income countries. Even so, traditional healers tend to incorporate diabolic and unhygienic practices into the diagnosis, prevention and treatment of kidney diseases. However, with better regulation and collaboration between health care providers and traditional healers, this gap can be bridged [29].

Study Limitations
The study was not without limitations as it was only a snapshot, and thus, unable to establish a cause-effect relationship since it was a cross-sectional. The study utilized only quantitative design and thus did not elicit more detailed information if qualitative study design was incorporated. Study was descriptive and lacked immediate direct intervention as respondents were not told the right/wrong answers following their responses.

CONCLUSION
Moderate number of students demonstrated high knowledge level and positive attitude towards kidney health. Among the three assessed sub-themes, the students demonstrated the highest percentages in good practices towards kidney health. Socio-demographic characteristics significantly affect the knowledge, attitude and practices of health-related students to kidney health, thus a need to enhance practical exposures to disease-settings and improve teaching curricula.

REFERENCES
1. Ogobuiro I, Tuma F. Renal Physiology. StatPearls Publishing, Treasure Island. July 25, 2022. https://www.ncbi.nlm.nih.gov/books/NBK538339/
2. Fi DR. Kidney Function. Clinical Biochemistry of Domestic Animals. June 27, 2014. Accessed February 2023 from https://www.sciencedirect.com/science/article/pii/B9780123963505500140
3. National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)). Kidney Disease. Health Information. December 27, 2022. Accessed February 2023 from https://www.niddk.nih.gov/health-information/kidney
4. Kahindo, CK., Mukuku, O, Wembonyama, SO, Tsongo Z K. Prevalence and Factors Associated with Acute Kidney Injury in Sub-Saharan African Adults: A Review of the Current Literature. International Journal of Nephrology, 2022, 5621665, 2022. https://doi.org/10.1155/2022/5621665

5. Younes S, Mourad N, Safwan J, Dabbous M, Rahal M, Al Nabulsi M, Sakr F. Chronic kidney disease awareness among the general population: tool validation and knowledge assessment in a developing country. BMC Nephrology, 23(1), 2022. https://doi.org/10.1186/s12882-022-02889-2

6. Alebiosu OC, Ayodele OE. The global burden of chronic kidney disease and the way forward. Ethnicity and Disease, 15(3), 2005, 418-423. https://www.researchgate.net/publication/7652964

7. George C, Mogueo A, Okpechi I, Echouffo-Tcheugui JB, Kengne AP. Chronic kidney disease in low-income to middle-income countries: The case of increased screening. BMJ Global Health, 2(2), 2017. https://doi.org/10.1136/bmjgh-2016-000256

8. Kovesdy CP. Epidemiology of chronic kidney disease: an update 2022. Kidney International Supplements,12(1), 2022, 7-11. https://doi.org/10.1016/j.kisu.2021.11.003

9. Li PKT, Garcia-Garcia G, Lui SF, Andreoli S, Fung WWS, Hradsky A, Kumaraswami L, Liakopoulos V, Rakhimova Z, Saadi G, Strani L, Ulasi I, Kalantar-Zadeh K, Li PKT. (2020). Kidney health for everyone everywhere—from prevention to detection and equitable access to care. Kidney International, 97(2), 2020, 226–232. https://doi.org/10.1016/j.kint.2019.12.002

10. Ameh OI, Ekrikpo U, Bello A, Okpechi I. Current management strategies of chronic kidney disease in resource-limited countries. International Journal of Nephrology and Renovascular Disease, 13, 2020, 239–251. https://doi.org/10.2147/IJNRD.S242235

11. Levin A, Tonelli M, Bonventre J, Kasiske B, Kretzler M, Levey AS, Moe O, Agarwal SK, Alrukhaimi M. Lancet Commission Global Kidney Health 2017 and beyond: A roadmap for closing gaps in care, research, and policy. Lancet Commission, 2017, 1–83.

12. Luyckx VA, Tonelli M, Stanifer JW. The global burden of kidney disease and the sustainable development goals. Bulletin of the World Health Organization, 96(6), 2018, 414-422C. https://doi.org/10.2471/BLT.17.206441

13. Vassalotti JA, Centor R, Turner BJ, Greer RC, Choi, M, Sequist TD. Practical Approach to Detection and Management of Chronic Kidney Disease for the Primary Care Clinician. American Journal of Medicine, 129(2), 2016, 153-162.e7. https://doi.org/10.1016/j.amjmed.2015.08.025

14. Bello AK, Levin A, Tonelli M, Okpechi IG, Feehally J, Harris D, Jindal K, Salako BL, Rateb A, Osman, MA, Qarni B, Saad S, Lunney M, Wiebe N, Ye F, Johnson DW. Assessment of global kidney health care status. JAMA - Journal of the American Medical Association, 317(18), 2017, 1864–1881. https://doi.org/10.1001/jama.2017.4046

15. Khalil A, Abdalrahim M. Knowledge, attitudes, and practices towards prevention and early detection of chronic kidney disease. International Nursing Review, 61, 2014, 237–245.

16. Tod Ibrahim. ASN presidential address 2012: A Commitment to Excellence in Kidney Care. ASN Kidney News, 24(7), June 28, 2022, 10–11. https://doi.org/10.1681/ASN.2013050440

17. Langham RG, Kalantar-Zadeh K, Bonner A, Balducci A, Hsiao LL, Kumaraswami LA, Laffin P, Liakopoulos V, Saadi G, Tantisattamo E, Ulasi , Lui SF. Kidney health for all: Bridging the gap in kidney health education and literacy. Journal of Renal Care, 48(2), 2022, 76–83. https://doi.org/10.1111/jorc.12414

18. Stemer G, Lemmens-Gruber R. Clinical pharmacy activities in chronic kidney disease and end-stage renal disease patients: A systematic literature review. BMC Nephrology, 12(1), 2011. https://doi.org/10.1186/1471-2369-12-35

19. Nsukka, U. of N. Founding the University, University of Nigeria. About the University. 2011a. Accessed February 2023 from https://web.archive.org/web/20110708012345/ http://unn.edu.ng/about/founding-university

20. Nsukka, U. of N. Through the years, University of Nigeria. About the University. 2011b. Accessed February 2023 from https://web.archive.org/web/20110708035123/ http://unn.edu.ng/about/through-years

21. Wikipedia. Faculty of Pharmaceutical Sciences, University of Nigeria Nsukka _ Faculty of Pharmaceutical Sciences,

University of Nigeria Nsukka. Wikipedia, the Free Encyclopedia. 2019b. Accessed February 2023 from https://pharmacy.unn.edu.ng/

22. Wikipedia. Enugu State. Wikipedia, the Free Encyclopedia. 2019a. Accessed February 2023 from http://southeast.ng/seredec/the-region/enugu-state/

23. Langham RG, Kalantar-Zadeh K, Bonner A, Balducci A, Hsiao LL, Kumaraswami LA, Laffin P, Liakopoulos V, Saadi G, Tantisattamo E, Ulasi I, Lui SF. Kidney health for all: Bridging the gap in kidney health education and literacy. Journal of Renal Care, 48(2), 2022, 76–83). https://doi.org/10.1111/jorc.12414

24. Ademola AO, Akinwumi AA, Osamudiamen II, Emmanuel A, Ogungbemi O. Assessment of Knowledge of Chronic Kidney Disease among Non-nephrology Nurses in Akure, South-West Nigeria. Saudi Journal of Kidney Diseases and Transplantation, 29(6), 2018, 1417–1423. Accessed February 2023 from http://www.sjkdt.org

25. Wolide AD, Kumela K, Kerga F, Debalke S, Seboka M, Edilu B, Gashe F, Bobassa EM. Health sciences students' knowledge, attitude and practices with chronic kidney disease in Jimma University, Ethiopia: Cross-sectional study. BMC Research Notes, 12(1), 2019. https://doi.org/10.1186/s13104-019-4426-6

26. National University Commission. Benchmark minimum academic standards for undergraduate programmes. 2015. https://nuc.edu.ng/wp-content/uploads/2015/09/Pharmacy%20Draft%20BMAS.pdf

27. West African Health Organization. Harmonized curriculum for doctor of pharmacy degree (pharmd.) Training in the ECOWAS region. 2015. Accessed February 2023 from https://www.wahooas.org/web-ooas/sites/default/files/publications/1849/harmonized-curriculum-doctor-pharmacy-degree-training-ecowas-region.pdf

28. Richa N, Bharosha B, Abhishek B, Bishow NA, Rhishikesh N, Nimesh K N, Nimesh. Knowledge, Attitude and Practice Regarding Kidney Diseases among Primary Care Physicians working in Nepal. Journal of Advances in Internal Medicine, 11(1), 2022, 1-9. https://doi.org/10.3126/jaim.v11i1.48039

29. Asare C, Aziato L, Boamah D. Facilitators and barriers to the clinical administration of herbal medicine in Ghana: a qualitative study. BMC Complementary Medicine and Therapies, 21(182), 2021. https://doi.org/10.1186/s12906-021-03334-x