ORIGINAL ARTICLE   Open Access

Perceived barriers to management of chronic kidney disease

Authors: J. C. Shyaka[1]; G. Chironda[1,2,3,*]; V. Dushimiyimana[1]; L. Umuhire[1]; M. Nkuranyabahizi[1]; F. Ngendahayo[1]; L. Rajeswaran[1,2]

Affiliations: [1]School of Nursing and Midwifery, University of Rwanda, college of medicine and Health Sciences, Kigali, Rwanda; [2]Human Resources for Health (HRH), Masters Programme, New York University, Rory Meyers   College of   Nursing, USA; [3]University of KwaZulu Natal. School of Nursing and Public Health. Republic of South Africa

ABSTRACT

INTRODUCTION: The number of patients with chronic kidney disease (CKD) is gradually increasing in developing countries such as Rwanda. Barriers to the management of CKD from nurses' perspectives is not an area that has been well explored.
This study aimed to assess the perceived barriers to CKD management from the perspective of nurses working at the referral hospitals in Rwanda.
METHODS: The study used a cross-sectional research design. The study setting was selected referral hospitals in Kigali. A convenience sample of 55 nurses was obtained and data was collected using a self-administered questionnaire. Analyses were done using descriptive and inferential statistics in the SPSS application.
RESULTS: Respondents identified the most barriers to management of CKD as: limited knowledge of CKD (96%) and its risk factor of glomerulonephritis (93%), limited information of dialysis (98%) and fluid restriction (95%) treatment as well as a lack of further training on nephrology nursing (93%). Shortage of nephrologists and nurses (98%) and a multidisciplinary care team (95%) were resource barriers. Other barriers were limited knowledge of CKD risk factors: hypertension (78%) and HIV/AIDS (80%), limited in-service training (69%), and non-adherence (86%). The experience of respondents was associated with limited knowledge of CKD risk factors: hypertension (P =0.001), diabetes (P=0.001) and HIV/AIDS (P=0.040). The level of nursing obtained by the respondents was associated with a lack of further special training (p=0. 001), limited in-service training (P=0.028) and non-adherence of CKD patients (P=0.017).
CONCLUSION: Barriers to CKD management in Rwanda are evident. There is a need for in-service training for nurses in order to improve the proper treatment of the CKD population.

Keywords: Disease Management, Chronic Kidney Disease, Nurses, Rwanda

INTRODUCTION

Chronic Kidney Disease (CKD) is a worldwide public health problem in both developed and developing countries [1]. Although CKD is treatable and preventable, the cases continue to escalate with an estimated prevalence in the range of 10% to 13%, thus leading to increased global morbidity and mortality [2,3]. The current situation is also shaped by the increasing prevalence of risk factors, namely diabetes mellitus, hypertension and obesity and the ageing of the population in developed and developing nations [4,5]. Moreover, CKD derives from unique pathophysiology that contributes to the prevalence of cardiovascular and death [6]. In Africa, northern Africa accounts for 6% of CKD prevalence. Western Africa accounts for 19.8%, middle Africa for 16%, Eastern Africa for 14.4% and southern Africa for 10.4 % [7]. In Rwanda, a part of Eastern Africa, there is limited data on CKD. However, the available information highlighted an overall prevalence ranging from 4% to 24% based on proteinuria [8,9]. The increasing prevalence is coupled with the complex management of CKD, which includes medication, dialysis, and fluid and dietary restriction [10]. Moreover, physicians cannot provide all the patient's needs alone, hence the need for a collaborative approach with nurses and other health care professionals to tackle the CKD. Secondary and tertiary preventive strategies for CKD need to be enhanced [11]. So, the need for nurses to carry out these strategies is evident. However, the complexity in the treatment, including the high costs of dialysis therapies, pose challenges for developing nations like Rwanda. This consequently leads to a variety of obstacles and constraints to nurses as they endeavor to provide care for the CKD population. Therefore, the objective of the current study was to assess the perceived barriers to the management of CKD patients among nurses at referral hospitals in Rwanda.

METHODS

Design: Our study adopted a descriptive cross-sectional design with a quantitative approach to assess the perceived barriers to management of CKD among nurses working at the selected study sites. Data was collected from April to May 2019. The STROBE checklist cross-sectional was used to guide the reporting of this study.

Study setting: The study was carried out at two major hospitals: The University Teaching Hospital of Kigali (CHUK) and the Rwanda Military Hospital (RMH). The study sites were chosen because all patients with CKD are admitted and treated at these hospitals.

Participants: All consenting nurses working in the internal medicine and dialysis unit at the selected referral hospitals in Rwanda were enrolled in the study. The nurses who were absent at the time of data collection and who declined to sign the consent were excluded from the study. A convenience sample of 55 nurses was selected for the study.

Measures: The data were collected using a questionnaire developed from an in-depth literature review. The instrument was composed of two sections, including demographic characteristics and the participant's perception of barriers to management of CKD. Section 1 included: Sociodemographic characteristics included the age, gender, level of education, religion, duration of experience in the service occupation, marital status and nursing level. Nursing level relates to the grades and classifications according to responsibility level within the nursing profession. Section 2 established the perceived barriers according to knowledge, CKD treatment, training and resources. All the responses for Sections 1 and 2 were measured in frequencies and percentages.

Reliability and validity: The questionnaire was developed from an in-depth literature review. Experts in the field checked the tool to ensure that all the content of barriers to CKD management had been covered. Prior to data collection, the research tool was pretested on 5 nurses to check for clarity and ambiguities. After pretesting, no changes were made to the tool, as all the questions were clear to the respondents.

Data analysis: After data collection, the findings were checked, coded and entered into SPSS software for analysis. All quantitative data analysis was completed using the Statistical Package for Social Sciences (SPSS) version 23. Descriptive summary statistics in the form of frequencies and percentages were used to describe participants' demographic characteristics and responses to barriers to management of CKD. Inferential statistics of a chi-squared test were used to determine an association between sociodemographic characteristics and barriers to CKD management. Ethical clearance approval was obtained from the

University of Rwanda (Ref: CHMS/IRB/081/2019). Clearance was obtained from selected referral hospitals in Rwanda (Ref: EC/CHUK/057/2019 and RMH IRB/024/2019). Informed written consent, which included an explanation of the purpose of the study, was given to the study participants. Participation in the study was voluntary.

RESULTS

As shown in Table 1, the largest age group among respondents who participated in the study was between 31 and 40 years (56%). Female respondents (70%) predominantly participated in the study and married respondents were more than two-thirds (73%) of the total number. All respondents (100%) who participated in the study had been trained at either a college or university. Most respondents identified themselves as Christian (94.50%). More than a third of respondents (38%) had been working for a period of between 5 and 10 years. The majority of respondents (93%) were bedside nurses.
As shown in Table 2, Respondents identified the

most barriers to management of CKD as: limited knowledge of CKD (96%) and its risk factors of glomerulonephritis (93%), hypertension (78%), diabetes mellitus (75%), HIV (80%), and aminoglycoside antibiotics (80%). Further, limited information on medication (93%), dialysis (98%), fluid (95%) and dietary restriction (78) were also highlighted as obstacles in the treatment of CKD. The majority of respondents agreed that non-adherence to recommendations (86%) and complications of dialysis (64%) were barriers. Lack of further training and limited in-service training on CKD management was revealed as barriers by 93 % and 69% of respondents, respectively. The most highlighted resource barriers were a shortage of nephrologists and nurses (95%), lack of a multidisciplinary care team (95%), over workload among nurses, and inadequate finances to cater for CKD treatment (87%). Moreover, the shortage of resources like urine dipsticks was also identified as a barrier by approximately 78% of the respondents.

The duration of experience in the service of

Table 1: Socio-demographic characteristics of study participants as summarized by villages

Variable	Category	Frequency	Percentage (%)
Age	18-30	13	24
	31-40	31	56
	41-50	11	20
Gender	Male	16	30
	Female	39	70
Marital	Married	40	
	Single	15	27
Education	University/college	55	100
Religion	Christianity	52	95
	Muslim	2	3
	Traditional	1	2
Duration of Experience in the service	Less than 1 year	4	7
	Between 1 to 2 years	1	2
	Between 2- 3 years	9	16
	Between 4 to 5 years	21	38
	Between 5 to 10 years	7	13
	Between 10- 15 years	9	16
	More than 15 years	4	7
Nursing Level	Bedside nurse	51	93
	Nurse in charge	4	7

Table 2: Perceived barriers to management of CKD among nurses(N=55)

Variable	Yes (%)	No (%)
Barriers related to limited knowledge on CKD and its risk factors		
CKD is defined as kidney damage or glomerular filtration rate (GFR) <60 mL/min/1.73 m^2 for 3 months or more, irrespective of the cause.	53(96)	2(4)
Hypertension is a risk factor for CKD	43(78)	12(22)
Diabetes mellitus is a risk factor for CKD	41(75)	14(25)
Glomerulonephritis is a risk factor for CKD	51(93)	4(7)
HIV is a risk factor for CKD	44(80)	11(20)
Aminoglycoside antibiotics are a risk factor for CKD	44(80)	11(20)
Barriers related to limited information on CKD treatment		
Management of CKD is based on the medication	51(93)	4(7)
Management of CKD is based on dialysis	54(98)	1(2)
Management of CKD is based on fluid restriction	52 (95)	3(5)
Management of CKD is based on dietary restriction	43(78)	12(22)
Non-adherence of patients to health care recommendation	47(86)	8(14)
A complication of hemodialysis treatment	35 (64)	20(36)
Barriers related to training		
Lack of further education training on nephrology nursing	51(93)	4(7)
Limited in-service training for CKD management	38(69)	17(31)
Barriers related to resources (Human and supply)		
Shortage of multidisciplinary care team	52 (95)	3(5)
Shortage of nephrologists and nurses	54(98)	1(2)
Poor management capacity of head nurse	40(73)	15(27)
Work overload among nurses	48(87)	7(13)
Shortage of resources like dipsticks and other medical devices	43(78)	12(22)
Lack of financial resources to cater for CKD treatment	48(87)	7(13)

respondents was associated with limited knowledge of CKD risk factors, namely hypertension (P>0.001), diabetes ((P>0.001) and HIV/AIDS (P=0.040). Further, the lower level of nursing in the unit was associated with a lack of further specialized training on nephrology nursing (p = 0. 001), limited-service training on the management of CKD (P=0.028) and non-adherence of CKD patients to health care recommendations (P=0.017) (Table 3).

The duration of experience in the service of respondents was associated with limited knowledge of CKD risk factors, namely hypertension (P>0.001),

Table 3: Sociodemographic factors associated with barriers to management of CKD

Outcome variables	X^2	P.-value
Experience and Hypertension as a risk factor of CKD	38.870	0.001
Duration of experience in the service and Diabetes, a risk factor of CKD	45.641	0.001
Duration of experience in the service and HIV, a risk factor of CKD	12.912	0.040
Lower nursing level and specialty training on CKD management	13.081	0.001
Lower nursing level and in-service training for CKD management	7.154	0.028
Nursing level and non-adherence to health care recommendation	8.152	0.017

diabetes ((P>0.001) and HIV/AIDS (P=0.040). Further, the lower level of nursing in the unit was associated with a lack of further specialized training on nephrology nursing (p = 0. 001), limited-service training on the management of CKD (P=0.028) and non-adherence of CKD patients to health care recommendations (P=0.017) (Table 3).

DISCUSSION

The number of female nurses who participated in the study outweighed that of male respondents, which agrees with a study by Chironda and Bhengu [10]. Muslim Shah and David Ross further highlighted the nursing profession as feminized and stereotyped with a predominantly female workforce employed worldwide [12, 13]. Moreover, there was a dominance of young nurses (31 to 40 years) in this study. A probable explanation is linked to the new regulations by the Ministry of Health (Rwanda), that state that nurses with either a degree or advanced degree should be employed at referral hospitals. This ruling favors the majority of young nurse practitioners who benefitted from recent developments in human resources for health in Rwanda [14]. Contrasting findings to the age of professional nurses working with CKD patients was highlighted in the study of Chironda and Bhengu, where the age ranged from 43 years to 49 years [10].

The majority of nurses highlighted limited knowledge of CKD and its risk factors as a barrier to managing the condition. This is similar to the barriers found by the systematic review done by Neale and colleagues [15]. A greater number of respondents agreed to limited information of CKD treatment, including complications of hemodialysis, to be an obstacle in CKD management, confirming the findings by Fatima, Afzal, and Ashraf [16]. Lack of further training and limited in-services training on CKD management was revealed as barriers, agreeing to the findings of Chironda and Bhengu [10] and Neale and others [15]. This consequently results in a lack of required expertise to manage the CKD population [17].

A shortage of nephrologists and nurses and a heavy workload for the available nurses were identified in this study as a barrier. This confirms the findings of Nobahar and Tamadon [18]. Naicker and Jha observed the same phenomenon. Most African countries, including Rwanda, do not have nephrologists and instead rely on allied health care professionals such as nurses [17]. However, the Ministry of Health in Rwanda and the HRH program, in collaboration with different health care centers and the University of Rwanda, are implementing a master's program in Nephrology Nursing to prepare the staff. This will further tackle the management of the CKD population [8]. This development will alleviate nurses' workload and improve the quality of care offered by the multidisciplinary care team.

Lack of adequate resources, coupled with financial challenges due to low economic status to cater for CKD treatment, has been identified. Moreover, dialysis, the major treatment of CKD in low-income countries including Rwanda, is an expensive procedure [19] and based on the low economic status, non-adherence becomes inevitable. In a study done by Colleine et al. [20] and Neale et al. [15], non-compliance and adherence were identified as barriers to CKD management. Moreover, the study revealed the nursing level associated with non-adherence of CKD patients to health care recommendations, lack of further training, and in-service training on CKD management. Therefore, there is a need to train more nurses in CKD management and nephrology nursing concepts so that nurses can give a comprehensive health assessment to the CKD population [20]. A significant number of nurses had been in the field for 5 years and less, contrasting the findings of Chironda and Bhengu [10], where the nurses had more than 5 years. The less experienced staff might be the reason for a statistically significant association with limited knowledge on risk factors of CKD.

The authors investigated perceived barriers to the management of CKD patients from nurses' perspectives. Therefore, information bias was possible as respondents may have had conflicting interests in reporting their answers. Furthermore, recall bias might have happened when the respondents were asked to recall information on the barriers they experienced in managing CKD patients.

CONCLUSION

In Rwanda, the ongoing increasing prevalence of kidney diseases necessitates focused prevention, treatment and rehabilitation strategies for the CKD population. In clinical practice, the existence of barriers to managing the CKD population is evident.

There is a need for further in-service training for nurses on the concepts of nephrology nursing, including the management of CKD patients. Moreover, increasing the human resource capacity in terms of nurses and nephrologists should be a long-term goal for Rwanda. Fortunately, Human Resource for Health (HRH) Rwanda is implementing the program effectively.

REFERENCES

[1] Carney, E. F. (2020). The impact of chronic kidney disease on global health. Nature Reviews Nephrology, 16(5), 251-251.

2. Ammirati, A. L. (2020). Chronic Kidney Disease. Revista da Associação Médica Brasileira, 66, s03-s09.

3. Bikbov, B., Purcell, C. A., Levey, A. S., Smith, M., Abdoli, A., Abebe, M., ... & Owolabi, M. O. (2020). Global, regional, and national burden of chronic kidney disease, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. The Lancet, 395(10225), 709-733.

4. Ruiz-Ortega, M., Rayego-Mateos, S., Lamas, S., Ortiz, A., & Rodrigues-Diez, R. R. (2020). Targeting the progression of chronic kidney disease. Nature Reviews Nephrology, 16(5), 269-288.

5. Luyckx, V. A., Cherney, D. Z., & Bello, A. K. (2020). Preventing CKD in developed countries. Kidney international reports, 5(3), 263-277.

6. Lo, R. H., & Glassock, R. J. (2021). Prevention of Cardiovascular Disease in Patients with Chronic Kidney Disease. In ASPC Manual of Preventive Cardiology (pp. 611-651). Springer, Cham.

7. Kaze AD, Ilori T, Jaar BG, Echouffo-tcheugui JB. Burden of chronic kidney disease on the African continent: a systematic review and meta-analysis. 2018;1–11. Available from https://doi.org/10.1186/s12882-018-0930-5

8. Chironda, G., Ngendahayo, F., Mudasumbwa, G., Dushimiyimana, V., JeanneTuyisenge, M., Kayitesi, J., ... & Katende, G. (2019). Renal replacement therapy (RRT) in Rwanda: benefits, challenges and recommendations. Rwanda Medical Journal, 76(3), 1-6.

9. Ishimwe, A. R., Habyarimana, T., Mucumbitsi, J., Yadufashije, C., & Niyonzima, F. N. (2021). Association of Creatine Level and Hematological Parameters among Kidney Patients at Rwamagana Provincial Hospital. American Journal of Biomedical Sciences, 13(1).

10. Chironda, G., & Bhengu, B. (2019). Barriers to management of Chronic Kidney Disease (CKD) CKD in a renal clinic in KwaZulu-Natal Province, South Africa–A qualitative study. International Journal of Africa Nursing Sciences, 10, 116-123.

11. Ameh, O. I., Ekrikpo, U., Bello, A., & Okpechi, I. (2020). Current Management Strategies of Chronic Kidney Disease in Resource-Limited Countries. International Journal of Nephrology and Renovascular Disease, 13, 239.

12. Shah M, Parpio Y, Zeb A. Perceptions of Male Nurses about Nursing Profession. 2017;1(4):1206–8. Available from DOI: 10.26717/BJSTR.2017.01.000398.

13. Ross D, Nightingale F. Challenges for Men in a Female Dominated Environment. 2(2017):4–20. viewed from http://openjournals.ljmu.ac.uk/lhsc.

14. Cancedda, C., Cotton, P., Shema, J., Rulisa, S., Riviello, R., Adams, L. V., ... & Binagwaho, A. (2018). Health professional training and capacity strengthening through international academic partnerships: The first five years of the Human Resources for Health Program in Rwanda. International journal of health policy and management, 7(11), 1024.

15. Neale, E. P., Middleton, J., & Lambert, K. (2020). Barriers and enablers to detection and management of chronic kidney disease in primary healthcare: a systematic review. BMC nephrology, 21(1), 1-17.

16. Fatima, T., Afzal, A., & Ashraf, S. (2018). Chronic Kidney Disease. The Professional Medical Journal, 25(06), 887-891.

17. Naicker, S., & Jha, V. (2020). Nephrology in Africa: forgotten no more. Kidney international, 98(4), 804-806.

18. Nobahar M, Tamadon MR. Barriers to and facilitators of care for hemodialysis patients; a qualitative study. 2016;5(1):39–44. Available from DOI: 10.15171/jrip.2016.09.

19. Mukakarangwa, M. C., Chironda, G., Bhengu, B., & Katende, G. (2018). Adherence to hemodialysis and associated factors among end stage renal disease patients at selected nephrology units in Rwanda: a descriptive cross-sectional study. Nursing research and practice, 2018.

20. Collein, I., Sitorus, R., Yetti, K., & Hastono, S. P. (2021). Facilitators and barriers to self-management of patients' chronic kidney disease. Enfermería Clínica, 31, S37-S40.