



Awareness and self-care practice regarding prevention of chronic kidney disease among hypertensive patients at the University Teaching Hospital of Butare, Rwanda

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ABSTRACT

Introduction: There is a strong relationship between Hypertension and Chronic Kidney Disease. To minimize and prevent the occurrence of Chronic Kidney Disease, hypertensive patients have to be aware of their condition and adhere to recommended self-care practice.

Aim of the study: To assess the awareness and self-care practice regarding the prevention of Chronic Kidney Disease among patients living with hypertension at the University Teaching Hospital of Butare.

Methodology: The study design was descriptive cross-sectional. A sample size of 140 was selected using purposive sampling strategy. Data was collected using a closed-ended questionnaire. Descriptive and inferential statistics were used to analyze data.

Results: Nearly 49% had a low level of awareness, and moderate self-care practice was observed in 56.5% of study participants. Educational level was discovered to be associated with the awareness ($p = .026$). Factors associated with self-care practice were age ($p = .000$), marital status ($p = .003$), educational level ($p = .020$), occupation ($p = .021$) and residence ($p = .026$). A significant weak positive relationship between awareness and self-care practice of participants ($r = 0.254$, $p = 0.02$) was established.

Conclusion: Altered levels of awareness and self-care practice regarding Chronic Kidney Disease prevention was revealed. Health care professionals including nurses need to intensify health education to improve awareness and provide adequate information to hypertensive patients on the importance of good self-management. Further research is called for to identify further factors contributing to moderate self-care practice of preventing CKD since awareness only explained 6.4% variance.

1. Introduction

Chronic Kidney Disease (CKD) and hypertension (HTN) are two diseases with strong cause and effect interrelationships. Hypertension is a typically recognized principal risk factor of CKD while in reciprocal, a decrease in renal function leads to HTN which in turn accelerates the progression to renal failure (Judd & Calhoun, 2015). While the global prevalence of HTN is around 1.13 billion among adult population (American College of Cardiology, 2016), estimations for CKD show figures between 8% and 16% (Zhang et al, 2016). In Africa including

Rwanda, HTN affects 24.7% of the overall adult population, but only less than 3% of the people needing renal replacement therapy (RRT) are able to receive it (Kumela Goro et al, 2019).

By 2025, the projections on the global number of hypertensive population is expected to be around 1.56 billion thus corresponding to 29% of the overall world adult population. This increasing number is significantly associated with various factors such as the family background, diet, lifestyle, and the environment (Bakhsh et al, 2017). Though the prevalence of HTN remains elevated, hypertensive patients continue to exhibit low level of awareness thus increasing the risk of

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acquiring CKD complications (Mohamed et al, 2018). To prevent these related complications, hypertensive patients need to be aware of their condition and adhere to self-care practice such as medical prescriptions and lifestyle changes. However, in their daily life, many patients fail to regularly implement these recommendations, hence a high risk of developing CKD complications (Ademe et al, 2019).

Despite the recognized importance of increased awareness and self-care practice in the prevention of CKD among hypertensive patients; studies continue to reveal a low level of awareness among these patients. This is evident especially in the low- and middle-income countries where less than 10% of patients living with HTN are aware of the interconnected relationship to CKD (Sherwood & McCullough, 2016). Additionally, evidence of poor self-care practice have been observed where only 36.1% were found to be adhering to HTN medication, 24.5% to regular physical activity, 39.2% to program of weight reduction, and 12.3% to low salt intake (Motlagh et al, 2016). However, little is still known about the awareness and self-care practice of preventing CKD in Africa and this includes Rwanda. Therefore, the current study assessed the awareness and self-care practice regarding the prevention of CKD among patients living with hypertension at the University Teaching Hospital of Butare in Rwanda.

2. Methodology

2.1. Research design and setting

The study employed a descriptive cross-sectional design. The period of data collection was from 11 May to 11 June 2019. The setting was at the University Teaching hospital of Butare, located in Huye District of the Southern Province of Rwanda. It is one of Rwanda's national referral hospitals which serves the population of the Southern and Western Province.

2.2. Population and sampling

The study population constituted adult HTN patients attending the outpatient department (OPD) of the study site. The accessible population included HTN patients available during the period of data collection. A sample size of 140 was calculated using the Slovin formula (Sugiyono, 2013), where $n = N/(1 + Ne^2)$, with a confidence interval of 95%, a margin of error equivalent to 0.05 and N is the number of hypertensive patients attending the study site per month. Purposive sampling strategy was used to select the study participants.

2.3. Data collection instrument

The instrument used for this study was adapted with permission from Khalil and Abdalrahim (2014). The adapted tool for the current study consisted of 3 categories: socio-demographic characteristics; awareness and self-care practice regarding the prevention of CKD among patients living with HTN. The participants responded by choosing one answer between Yes and No and then ticking the appropriate box. Each correct answer was merited with 1 point. The scores for awareness were calculated out of 17 with classification into 3 categories: low (0–8 points) equivalent to 0–49%, moderate (9–11 points) equivalent to 50–69%, and high (12–17) equivalent to 70–100%. With regards to self-care practice, the total score was calculated out of 28. The classified categories of the obtained score were: low (0–13) equivalent to 0–49%, moderate (14–19) equivalent to 50–69% and high (20–28) equivalent to 70–100%.

The validity and reliability of the tool used in the current study were ensured (Heale & Twycross, 2015). The tool was modified and some aspects of depth literature review were added to fit the context of Rwanda. Experts in the clinical and academic area were utilized to evaluate the content of the questionnaire. With regards to reliability, the original English version was translated to Kinyarwanda and back-

translation to English thus ensuring the consistency in both languages. Pretesting of the tool was conducted on a small sample of 15 hypertensive patients and no changes were made to the tool as the participants were able to understand and comprehend the information. The internal consistency of the tool, determined by Cronbach alpha was 0.7, meaning the instrument was an acceptable measure (Gliem & Gliem, 2003) of awareness and self-care practice.

2.4. Data collection procedure

After obtaining an ethical approval from the Institutional Review Board of the University of Rwanda, College of Medicine and Health Sciences (Ref: CMHS IRB 076/2019) and study site (Ref: CHUB/DG/SA050777/2019), the collection of data began. The researcher visited the outpatient department to meet the eligible participants with help from the nurse in charge. The nurse in charge provided the register with all the hypertensive patients coming to the outpatient department for their medical reviews. The eligible participants were informed about the study and granted liberty to withdraw at any period during the data collection.

All those who agreed to participate in the study signed an informed consent after receiving full information about the study. A written information sheet in either local or English language was distributed to the participants to absorb the information. Furthermore, they were given opportunities to bring forth any related enquiries with the researcher advising accordingly. Thereafter, the researcher gave the questionnaires to participants to fill in while they waited for their opportunity to be interviewed. Participants requiring assistance such as the illiterate were provided with the proper guidance to complete their questionnaires. One hundred and forty questionnaires were answered during the period of data collection.

2.5. Data analysis

The determined significance level was of 0.05 and all statistical analyses have been performed using SPSS version 21. Descriptive statistics were used to describe the demographic data, level of awareness and self-care practice among hypertensive patients regarding the prevention of CKD. Inferential statistics of Chi square were used to establish an association between demographic characteristics, awareness and self-care practice of hypertensive patients regarding the prevention of CKD. The correlational coefficient (r) was used to identify the direction and the strength of the relationship between awareness and self-care practice.

3. Results

3.1. Demographic data of study participants

A significant number of the participants were aged over 51 years (55%) with majority being females (66.4%). Half of the participants were married (50%); and the majority had at least attended primary school (83.6%). There were 50.7% self-employed and 51.4% living in the urban areas. The family antecedents of hypertension were found in 35.7% of participants and 44.3% were living with hypertension for a period of 5 years and over (Table 1).

3.2. Awareness of hypertensive patients regarding the prevention of CKD

While the majority (82.9%) were aware that HTN was a serious threat to their life, less than a half (42.1%) were aware that CKD can be a complication of HTN. Regarding the awareness about the risk factors for CKD, 44.3%, 42.1%, 55%, 56.4% and 53.6% of the participants were aware that obesity, elevated blood lipids and irregular physical activity, smoking, high intake of alcohol, and high intake of salt can lead hypertensive patients to getting CKD respectively (Table 2).

Table 1
Socio-demographic characteristics of the participants (n = 140).

Variable	Frequency	Percentage (%)
Age (in years)		
18–30	9	6.4
31–40	26	18.6
41–50	28	20
51–60	36	25.7
Above 60	41	29.3
Gender		
Male	47	33.6
Female	93	66.4
Marital status		
Single	16	11.4
Married	70	50
Divorced	15	10.7
Widowed	39	27.9
Educational level		
None	23	16.4
Primary	53	37.9
Secondary	36	25.7
College/university	28	20
Occupation		
Manual labor	47	33.6
Student	3	2.1
Clerical	13	9.3
Professional	11	7.1
Tradesperson	19	13.6
None	48	34.3
Residence		
Rural area	68	48.6
Urban area	72	51.4
Duration of hypertension diagnosis (in years)		
0–2 years	37	26.4
2–5 years	41	29.3
5–10 years	33	23.6
More than 10 years	29	20.7

4. Self-care practice of hypertensive patients regarding the prevention of CKD

The most practiced dietary self-care were respecting low salt [129 (92.1%)] and eating a healthy diet [111 (79.3%)]. Whilst walking [119 (85%)], non-smoking [114(81.4)] and non-alcohol [118(84.3%)] were most adopted lifestyle changes, running [105(75%)] was not. The majority [113 (80.7%)] always forget to take their antihypertensive medication and 134 (95.7%) had at least stopped antihypertensive drugs without medical advice. However, 109 (77.9 %) were not obliged to adhering to their treatment plans. More than 90% of the participants were able to practice positive health seeking behaviors of regular medical reviews [126(90%)], regular blood pressure checkups [131 (93.6%)] and not consulting traditional healers [134(95.7%)] (Table 3).

4.1. Level of awareness and self-care practice regarding the prevention of CKD

With respect to awareness, the lowest and highest observed score was 0 and 17 respectively out of the total score of 17. Sixty-eight (48.6%) scored low, 14 (10%) moderate and 58 (41.4%) high level of awareness towards the prevention of CKD (Table 4). With respect to self-care practice, the minimum score was 8 while the maximum was 26 out of a possible score of 28. The majority [79 (56.5%)] exhibited moderate level, 52 (37.1%) high level and only 9 (6.4%) with low level of self-care practice (Table 4).

Table 2
Awareness of hypertensive patients regarding the prevention of CKD (n = 140).

Variables	Correct answer (Yes)		Wrong answer (No)	
	Frequency	%	Frequency	%
Hypertension is a serious disease and a threat to my life	116	82.9	24	17.1
Chronic kidney is a serious complication of hypertension	59	42.1	81	57.9
Kidney disease is a serious and irreversible disease	104	74.3	36	25.7
Hypertension can silently (without symptoms) lead me to having kidney disease	59	42.1	81	57.9
Having uncontrolled high blood pressure make me more likely to get kidney disease	59	42.1	81	57.9
Having untreated hypertension will increase my chances of getting kidney disease.	59	42.1	81	57.9
Obesity increases risk of getting kidney disease for hypertensive patients	62	44.3	78	55.7
Having elevated lipid in my blood will increase my risk of getting kidney disease	59	42.1	81	57.9
Not having a regular physical activity increases my risk of getting kidney disease	59	42.1	81	57.9
Smoking increases the risk of getting kidney disease	77	55	63	45
High intake of alcohol increases the risk of getting chronic kidney disease	79	56.4	61	43.6
High intake of salt increases risk of getting chronic kidney disease	75	53.6	65	46.4
Regular checkup of blood pressure is needed to prevent chronic kidney disease	71	50.7	69	49.3
Prevention of high blood pressure complications is also patient's responsibility	120	85.7	20	14.3
Family can assist me in the prevention of chronic kidney disease	82	58.6	58	41.4
Prevention of chronic kidney disease through respecting medical regimens and advices is less expensive than treating chronic kidney disease	122	87.1	18	12.9
Drinking at least 2 L of water helps in prevention of chronic kidney disease	109	77.9	31	22.1

4.2. Factors associated with awareness and self-care practice regarding the prevention of CKD

The only factor found to be associated with awareness was the educational level (p = .026). Factors associated with the self-care practice were age (p = .000); marital status (p = .003); educational level (p = .020), occupation (p = .021); residence (p = .026). A significant weak positive relationship between awareness and self-care practice of participants (r = 0.254, p = 0.02) was established. The contribution of awareness to self-care practice was only explained by 6.4% variance (Table 5).

5. Discussion

5.1. Awareness of hypertensive patients regarding prevention of CKD

Majority of the participants were females, married with primary school education and unemployed thus confirming the findings by Sa'adeh et al (2018) and Ikasaya et al (2018). Low level of awareness regarding the prevention of CKD among patients with hypertension were found in the current study. This is similar to a study conducted by Pirasath et al (2017) who indicated unawareness of the hypertension in 40.5% of the population. However, 82.9% were aware that HTN is a

Table 3
Self-care practices regarding the prevention of CKD (N = 140).

Variables	Yes		No	
	Frequency	%	Frequency	%
Dietary self-care practices				
Respect food restrictions like low salt diet	129	92.1	11	7.9
Limiting daily sodium intake to no more than 1500 mgs	129	92.1	11	7.9
Eating a healthy diet, including fruits, vegetables, proteins, carbohydrate, low-fat food	111	79.3	29	20.7
Drink at least 2 L of water per day	80	57.1	60	42.9
Lifestyle changes				
Regular physical activities	71	50.7	69	49.3
Walking	119	85	21	15
Jogging	78	55.7	62	44.3
Running	35	25	105	75
Reduce weight if I am overweight or obese	85	60.7	55	39.3
Not smoke or have stopped to do it	114	81.4	26	18.6
Not drinking alcohol or limiting alcohol to two drinks a day for men, one drink a day for women	118	84.3	22	15.7
Not using herbal medicines	104	74.3	36	25.7
Adherence to medication				
Do you sometimes forget to take your antihypertensive drugs?	63	45	77	55
Did you not take BP medication over the last two weeks?	36	25.7	104	74.3
Did you take your BP medication yesterday?	113	80.7	27	19.3
When you travel or leave home, do you sometimes forget to bring along your BP drugs?	40	28.6	100	71.4
Have you ever cut back or stopped taking your BP drugs without telling your doctor, because you felt worse when you took it?	134	95.7	6	4.3
When you feel like your BP is under control, do you sometimes stop taking your BP medication?	16	11.4	124	88.6
Taking BP drugs every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?	31	22.1	109	77.9
Healthcare seeking				
Have regular medical visits even when I'm not sick	126	90	14	10
Regular check my blood pressure	131	93.6	9	6.4
Get medical checkup and advices when abnormal signs like nausea, vomiting, reduced urine are noticed	128	91.4	12	8.6
Do the laboratory exams proposed to me	134	95.7	6	4.3
Not consulting traditional healers before going to modern healthcare settings	134	95.7	6	4.3

Table 4
Level of awareness and self-care practices regarding the prevention of CKD.

Perceived awareness scores out of 17	Score in percentage	Frequency (%)	Level of awareness
0 to 8	0 to 47	68(48.6)	Low
9 to 11	52.9 to 64.7	14(10%)	Moderate
12 to 17	70.5 to 100	58(41.4%)	High
Self-care practices score out of 26	Score in percentage	Frequency	Level of self-care practices
8 to 13	28.6 to 46.2	9 (6.4%)	Low
14 to 19	50 to 67.8	79 (56.5%)	Moderate
20 to 26	71.4 to 92.8	52(37.1%)	High

Table 5
Factors associated with awareness and self-care practices regarding the prevention of CKD.

Variables	Factors associated with awareness		Factors associated with self-care practices	
	Mean (95% CI)	p value	Mean (95% CI)	p value
Age				
18–30 years	12.4 (7–17)	0.569	19.1 (15.2–23)	0.000
31–40 years	12.6 (10.3–15)		20.1 (19.3–21)	
41–50 years	8.2 (6.1–10.2)		19.3 (18.5–20.1)	
51–60 years	9.3 (7.7–11)		17.2 (16–18.4)	
Above 60 years	8.8 (7.1–10.5)		17.4 (16.7–18.1)	
Gender				
Male	10.9 (9.2–12.6)	0.457	19.5 (18.7–20.3)	0.069
Female	9.2 (8–10.3)		17.8 (17.2–18.4)	
Marital status				
Single	12 (8.5–15.4)	0.611	19.1 (16.9–21.4)	0.003
Married	10.2 (8.8–11.5)		18.9 (18.1–19.6)	
Divorced	10.2 (7.2–13.2)		19 (17.4–20.5)	
Widowed	8 (6.3–9.6)		16.9 (16.2–17.6)	
Education				
None	7.9 (5.3–10.5)	0.026	16.7 (15.9–17.6)	0.020
Primary	8.3 (7–9.6)		17.7 (16.9–18.5)	
Secondary University/ College	10.7 (8.9–12.4) 12.8 (10.3–15.2)		19 (18–20) 20 (18.8–21.3)	
Occupation				
Manual labor	8.6 (7–10.2)	0.690	18.5 (17.7–19.4)	0.021
Student	11.6 (-2–25.3)		15 (5–24)	
Clerical	12.3 (8.6–16.1)		20.6 (19.6–21.5)	
Professional	10.1 (5.8–14.3)		18.6 (15.5–21.6)	
Tradesperson	11.4 (9.1–13.7)	9.3 (7.6–11)	19.4 (18.4–20.3)	17.3 (16.4–18.3)
None	9.3 (7.6–11)		17.3 (16.4–18.3)	
Residence				
Rural area	8.6 (7.4–9.9)	0.119	17.8 (17–18.5)	0.026
Urban area	10.8 (9.4–12.2)		18.9 (18.3–19.6)	
Duration of hypertension				
0–2 years	8.8 (6.9–10.7)	0.363	18.7 (17.4–19.9)	0.383
2–5 years	9.5 (7.6–11.3)		18.7 (17.7–19.7)	
5–10 years	10.9 (8.9–12.8)		17.7 (16.8–18.6)	
More than 10 years	10.1 (8.1–12.1)		18.2 (17.3–19)	
Relationship between awareness and self-care practice regarding prevention of CKD				
r = 0.254	R ² = 0.065	Sig F change = 0.002	P Value = 0.002	

threat to their life, agreeing with the results of Bakhsh et al (2017). Nevertheless, the unawareness on causality relationship existing between HTN and CKD were noted thus agreeing with the findings of Pirasath et al (2017). On a positive note, Bakhsh et al (2017) indicated the overall level of awareness of 72%.

5.2. Self-care practice on prevention of CKD

Regarding the level of self-care practice, more than half exhibited moderate level thus similar to the findings of Ikasaya et al (2018). These findings are also supported by Khalil and Abdalrahim (2014) and Ademe et al (2019). The dietary practice of low salt diet, healthy diet and drinking recommended fluids per day were found to be good while Khalil and Abdalrahim (2014) found a contrasting result of only 29.6% respecting the low salt regimen and 18.6% constantly abiding by a balanced meal. The problem of salt restrictions is also observed by Ikasaya et al (2018) who revealed moderate salt intake in only 37.8% of the population.

Self-care practice of regular physical activity, not smoking nor drinking as well as desisting in use of herbal medicines were evident from the current study, confirming the findings of Khalil and Abdalrahim (2014) and Ikasaya et al (2018). However, with adherence to antihypertensive medication, a number of participants seemed to forget to take their anti-hypertension drugs. Those findings were partially supported by Khalil and Abdalrahim (2014) who highlighted an approximate of 37% not always taking antihypertension drugs, 2.3% not following their medication regimen and 35% taking drugs on an irregular routine. The study of Pirasath et al (2017) indicated 99% to be aware of the importance of antihypertension medications, but in practice 84.5% were poorly adhering to medication due to forgetfulness (23.1%) and interruptions of the daily routine (17.5%).

5.3. Factors associated with awareness and self-care practice regarding prevention of CKD

Educational level was the only factor associated with awareness of hypertensive patients thus supporting the findings of Mouhtadi et al (2018), Additionally, Liew et al (2019) specifically highlighted primary ($p = 0.03$) and secondary education ($p = 0.01$) to be significant. However, factors associated with self-care practice were age; marital status; educational level, occupation; and residence. This contrasts the findings of Sa'adeh et al(2018) and Neminqani et al (2013) that revealed only educational level to be significantly associated. Specifically, in the study of Neminqani (2013), participants with university education had high level of self-management practice compared to those without education. Nevertheless, Sadeq and Lafta (2017) found no demographic characteristics associated with self-care practice on prevention of CKD. In another study by Ademe et al (2019), a significant association between divorced and self-care compared to singles was revealed. A significant weak correlation between the awareness and self-care practice was indicated and this is similar to the findings of Bakhsh et al (2017). Contrary, the majority of studies were not highlighting any relationship between awareness and self-care practice.

5.4. Limitations of the study

The study was carried out in only one referral hospital in Rwanda which only serves the Southern and Western provinces, hence the results cannot be generalized to other regions in Rwanda. There was possibility of information bias as the respondents might have given more or less information on both awareness and self-care practice. Recall bias was quite possible as the participants were asked to recall what they remember about hypertension and CKD as well as their practice behaviors.

6. Conclusion

The findings revealed low awareness in nearly 49% and moderate self-care practice were observed in more than half (56.5%) of the population under study. While only education was found to be associated with the awareness, self-care practice was associated with age, marital status, educational level, occupation and residence. A significant weak positive relationship between awareness and self-care practice was established. These results indicate a significant number of hypertensive patients at an elevated risk of developing CKD which is irreversible and costly to treat. Health care professionals including nurses need to intensify health education to improve awareness and provide adequate information to hypertensive patients on the importance of good self-management. Further research is called for to identify further factors contributing to moderate self-care practice of preventing CKD since awareness only explained 6.4% variance.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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