Original Article

Quality of Care for Patients with Hypertension in selected Health Centres in Rwamagana District, Rwanda

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Abstract

Background
Hypertension is the main risk factor for cardiovascular diseases and its prevalence is high in Rwanda. Rwanda has integrated the management of hypertension in health centres (HCs). However, little is known about the quality of hypertension care in HCs in Rwanda.
Study objective
To examine the quality of care for patients with hypertension and associated outcome of hypertension control in Health Centres.
Methods
A cross-sectional study design was used, and data were collected from a convenience sample of 202 patients. A self-reported questionnaire and blood pressure measurement were taken. Data were analysed using descriptive, bivariate, and hierarchical logistic regression analyses.
Results
A total of 166 (82.2%) patients participated in the study. Of these, 130 (78.3%) were females. Mean age was 57.8 (SD =14.0). The quality of hypertension care process was high with mean score of 5.86 over 7 (SD = 1.4). However, only 30.1% (n = 50/166) had well-controlled hypertension. Comorbidity (OR = 2.3; 95% CI:1.0-5.1, p =.039) and the quality of care (OR = 1.6; 95% CI: 1.1- 2.4, p = .024) were associated with higher odds of having hypertension control.
Conclusion
Tailored patient-centred primary care interventions that consider comorbidity could contribute to hypertension control in primary HCs in Rwanda.
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Keywords: Hypertension, hypertension control, the quality of care, primary health care, Rwanda

Introduction

Chronic non-communicable diseases (NCDs) have become a public health challenge globally with people from Low and Middle Income countries (LMIC) being the most affected.[1] World Health Organization's estimates indicate 41 million NCDs-related death with 77% of these being from LMIC including Sub-Saharan Africa.[1–3] Hypertension is the most prevalent chronic non-communicable disease (NCD) and the main risk factor for cardiovascular diseases such as stroke, and coronary heart diseases globally.[4–8] About 1.39 billion adult people are living with hypertension worldwide with 1.04 billion (75%) being found in low-and middle-income countries.[9] In Rwanda, the prevalence of hypertension is approximately 15.3% of the general population.[6]

Unfortunately, a large population is unaware of their hypertension status. The World Health Organization (WHO) estimates only 42% of adult people are diagnosed and treated.[10] Forty six percent (46%) of those with hypertension are not aware of their hypertension status [10], therefore, these people do not seek care, subsequently not treated, and their blood pressure is poorly controlled. On a global scale, approximately 79% of hypertensive patients have uncontrolled blood pressure.[10] Hence, they are at a high risk of premature and sudden mortality. In Sub-Sahara Africa, evidence indicates low hypertension control with only 30% of hypertensive patients having hypertension control.[11] For example, in Ethiopian hospitals, uncontrolled hypertension varied from 52.5% to 73.5%. [11,12] A Rwandan study indicated that 38% to 59% of hypertensive patients attending Kigali University Teaching Hospital and Nyamata district Hospital had controlled hypertension, respectively.[13] This raises concern about hypertension management in the health care systems. The health care systems have the mandate to develop and implement strategies to improve early detection, treatment, and control of hypertension like other non-communicable diseases.[14]

The 2011 political declaration of the high-level meeting of the UN General Assembly on the prevention and control of NCDs acknowledged the critical role of primary health care systems in the management and control of NCDs like hypertension.[15] This declaration emphasizes the integration of NCDs in the primary health care level and primary health care programs.[15] Until 2006, patients with NCDs including hypertension were treated at tertiary or teaching and secondary hospitals in Rwanda by disease-specific physician specialists such as a cardiologist for cardiovascular diseases, internal medicine specialists or a diabetologist. These medical specialists were responsible for managing hypertension like other NCDs.[13] This lack of access to resources constituted a big barrier to hypertension care, like other chronic NCDs. [16,17]

Rwanda has started the integration of NCDs and their risk factors into the primary health care level.[18,19] The main objective of integration is to improve access to chronic care and care outcomes for patients with NCDs like hypertension.[14] Screening and management of chronic disease services are now included in the essential package of health services delivered in health centers.[20] Integrating NCDs prevention and control into primary health care would eliminate barriers to accessing effective care and would offer patients opportunities for accessing health care promotion, prevention, and continuity of care.[21] This could lead to improved health outcomes and clinical outcomes such as better hypertension control.[21]

In Rwanda, like in most sub-Saharan African countries, primary health care systems are run by nurses who are the main primary care providers.[22] Nurses have now taken responsibility for managing hypertension in primary care settings.[19,20] Nurse-led hypertension management can be cost-effective.[13,19,23] Yet, it might be challenging for nurses who are mainly well-equipped to address communicable diseases[3]

to manage hypertension which could negatively affect the quality of hypertension care. In fact, a study conducted in seven rural health care centers from Burera, Kirehe and Kayonza districts in Rwanda indicated that only 40% of patients with hypertension achieved hypertension control after twelve months of follow-up.[19] This raises the question of the quality of hypertension care in primary health care centers. The quality of hypertension care can be understood as the extent to which hypertension care process indicators are performed.[24] Little is known about the quality of hypertension management and its association with hypertension control in primary health care centers in Rwanda. This study aimed to examine the quality of the hypertension care process and its association with hypertension control in health care centers in the Rwamagana district, Rwanda.

Materials and Methods

Study design

A cross-sectional study design was used to examine the quality of hypertension care among hypertensive patients in Rwamagana district, Rwanda. Data were collected from 08/11/2020 until 31/01/2021.

Study settings

The study was conducted in two health centres from Rwamagana district in Rwanda. The selected health centers offer a minimum package of health services including health promotion services and prevention and treatment of non-communicable diseases, particularly hypertension, diabetes, cancer, and chronic obstructive pulmonary diseases. [20]

Population and sample

The study participants were patients who were receiving NCD services from two health centres in Rwamagana district. The two health centres are among the first primary care facilities that integrated NCDs prevention and management into their primary care services and were purposely selected. The two selected health centres were offering care to 202 patients with hypertension. These 202 patients constituted the study population. One health centre had 96 while the second health centre had 106 patients with hypertension. Inclusion criteria were: age of 18 years old, willing to participate. Exclusion criteria included: critically ill.

Data collection instrument and procedures

Data were collected using a questionnaire that comprised three sections: sociodemographic characteristics (e.g., age, gender, education, income, civil status, disease), quality of hypertension care component, and blood pressure measurement. Items of the questionnaire were composed using existing published literature on hypertension management and Rwanda's non-communicable disease management guidelines.[24–26] These items from the literature were adapted to the Rwandan context. Seven indicators of the quality of hypertension care included: Prescribed lowering medication, advice about increasing physical activity, advice on alcohol intake reduction, advice about sodium diet intake, advice about smoking cessation, regular follow-up blood pressure measurement at least once in three months and lab exam taken by health professionals for health monitoring.[24–26] Blood pressure was measured in mmHg with systolic blood pressure (SBP) and diastolic blood pressure (DBP).

The questionnaire has been previously used to investigate the quality of hypertension care and hypertension control in primary care.[24,25] The tool has construct validity. [24,27] Cronbach's Alpha in this study was .655, indicating the need for improved reliability.[28] One item of the quality of care (taking lab exams by health professionals for health monitoring) had lower Cronbach's alpha coefficient. When we remove this item, Cronbach's alpha improved to .702 which is acceptable reliability.[28] However, due to the importance of all items of the quality of hypertension care, we decided to keep them all.

The questionnaire was translated into Kinyarwanda, the language of the participants.

Data collection was conducted during patients' appointment visits in the health centres. Patients were approached in waiting rooms and were explained about the purpose of the study. Patients were explained that their participation was voluntary and that they had the right to withdraw whenever they felt uncomfortable without a negative effect on their care. Those who accepted to participate were given a consent form to sign and a questionnaire to complete. Participants who could not read and write were asked the questions by trained data collectors who completed the questionnaire on their behalf. Participants who could write submitted the completed questionnaires to researchers who compiled them together in a sealed envelope.

Data analysis

Researchers entered the data into the Statistical Package for Social Sciences (SPSS) version 21 using codes following which data were checked and cleaned. Descriptive and inferential statistics were used to summarize the data. Categorical variables (e.g., age, gender, educational level, marital status, employment, income, BMI, duration of hypertension, diabetes, HIV/AIDS, and comorbidity) were summarized using frequencies and percentages. The quality of the hypertension care process level was constructed by summing up all quality of hypertension care indicators and summarized using mean and standard deviation. If the activity/indicator of the quality of hypertension care was performed, one point was assigned to that activity while zero point was assigned to the activity which was not performed.

The minimum quality of care process score was zero while the maximum was seven. The quality of hypertension care process level was a continuous variable while hypertension control as an outcome variable was a binary variable.

A higher score for the quality of the hypertension care process indicated the higher quality of care process. The SBP ≥140mmHg and or DBP ≥90mmHg was considered uncontrolled hypertension while SBP <140 mmHg and DBP <90mmHg was considered as controlled hypertension.[26] The Chi-square test (X^2)was used to test an association between patients' characteristics and hypertension control. The chi-square test (X^2) was used to test an association between each indicator of quality of care process and hypertension control. While the quality of care was continuous variable and hypertension control was a binary variable, the chi-square test was not applicable in this case. The comparison of mean scores can be the most appropriate test. Therefore, the independent samples t-test was performed to examine the association between overall quality of hypertension care process level and hypertension control.

Variables that were statistically significant in bivariate analysis were entered into a hierarchical logistic regression analysis to examine the association between the quality of hypertension care and hypertension control. Hierarchical regression analysis is a type of regression model where independent variables are entered in steps during the data analysis process.[29] This model helps to identify the contribution of individual, hypertension-related factors and quality of care in the variance of hypertension control. A $p < .05$ at 95% Confidence Interval (2-sided) was considered statistically significant in the analysis.

Ethical considerations

The University of Rwanda, College of Medicine and Health Sciences Institutional Review Board approved the study (Ref: CMHS/IRB 243/2020). Heads of health centres also provided permissions to conduct the study in their health centres. In addition, participation was voluntary, and participants signed the consent form before data collection. Researchers used codes instead of names of participants to protect their privacy and confidentiality. Researchers followed all procedures

according to rules and regulations governing research involving human subjects.

Results

Participants' characteristics

A total of 166 over 202 respondents (82.2%) participated in the study. Seventy- eight percent (78.3%, n = 130/166) were females. Of the respondents (n = 166), 105 (63.3%) had 64 years old or less while 61 (26.7%) respondents had 65 years and above. The mean age of respondents was 57.8 years old (SD = 13.98). Most respondents, 121 (72.9%) had primary school level or less and 100 (60.2%) respondents were married. A total of 36 (21.7%) and 10 (6%) respondents were overweight and obese, respectively.Almost seventy percent of respondents (n = 116; 69.9%) have known their hypertension status for less than 5 years and 68 (41.2%) respondents had comorbidities. Of these respondents with comorbidities, the prevalent comorbidities include cardiovascular diseases (n = 37; 22.3%), diabetes (n = 24; 14.5%), chronic obstructive pulmonary disease (n = 13; 7.8%) and HIV/AIDS (n = 8; 4.8%), less than a third (n = 23; 13.9%) of respondents were consuming alcohol while five respondents (3%) were smoking. In addition, 29 (17.5%) respondents were unemployed, and 116 (69.9%) respondents had income of less than 28000 RwF per month. Of the respondents, 107 (64.5%) and 73 (44%) had systolic and diastolic hypertension, respectively. Overall, only 50 respondents (30.1%) had controlled blood pressure (Table 1).

Table 1. Participants' characteristics

Characteristics	N (%)	*M(SD)*
Age		57.8(13.98)
≤64	105 (63.3)	
65+	61 (36.7)	
Gender		
Female	130 (78.3)	
Male	36 (21.7)	
Education		
Primary school or less	121 (72.9)	
Secondary education or above	45 (27.1)	
Marital status		
Married	100 (60.2)	
Divorced/ separated/ widowed/single	66 (39.8)	
Employment		
Unemployed	29(17.5)	
Farmer/husbandry	109 (65.7)	
Employed	28(16.9)	
Income		
≤ 28000 RwF/per month (<$ 1 per day)	116 (69.9)	
>28000 RwF/per month	50(30.1)	
Smoking		
No	161(97)	
Yes	5 (3)	
Alcohol consumption		
No	143 (86.1)	
Yes	23 (13.9)	
BMI		
< 18.5: Underweight	15 (9)	
18.5 to < 25.0: Normal	105 (63.3)	
25 to < 30.0: Overweight	36 (21.7)	
≥ 30.0: Obese	10 (6)	
Duration of hypertension		
< 5 years	116 (69.9)	
≥ 5 years	50 (30.1)	
Co-morbidity		
Yes	68 (41.2)	
No	97 (58.8)	

Note: M=Mean; SD=Standard deviation

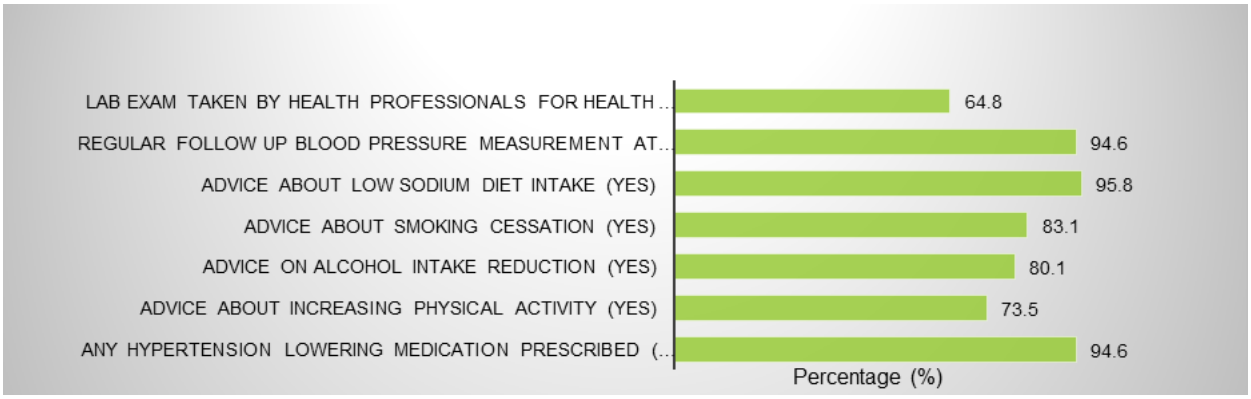
Table 1. Continued

Characteristics	N (%)	*M(SD)*
Co-morbidity diseases (*n*=68)		
Diabetes	24 (14.5)	
HIV/AIDS	8 (4.8)	
Any cardiovascular disease	37 (22.3)	
Chronic respiratory disease	13 (7.8)	
Systolic blood pressure (SBP)		
Normal	59 (35.5)	
Hypertensive systolic blood pressure (>=140mmHg)	107 (64.5)	
Diastolic blood pressure (DBP)		
Normal	93 (56)	
Hypertensive diastolic blood pressure (>=90 mmHg)	73 (44)	
Controlled Blood pressure (SBP <140 mmHg and < 90 mmHg of DBP		
Yes	50 (30.1)	
No	116 (69.9)	

Note: M=Mean; SD=Standard deviation

Quality of hypertension care

A total of 157 (94.6%) respondents had hypertension lowering medication prescribed and 122 (73.5%) respondents were provided advice about increasing physical activity. Of the respondents (n = 166), 133 (80.1%) were advised on reduction of alcohol intake and 138 (83.1%) respondents were advised about smoking cessation. Almost ninety-six percent of respondents, 158 (95.8%) were advised about low sodium diet intake. Nearly ninety-five percent of respondents, 158 (94.6%) received regular follow-up blood pressure measurement at least once in three months (Figure 1). The overall hypertension care process level was high with a mean score of 5.86 (SD = 1.4) over seven.



Note: n = 166 for each of the item indicators, except for advice about low-sodium diet intake as well as Lab exam taken by health professionals for health monitoring (n = 165).

Figure1.Distribution of quality of hypertension care indicators

Association between participants' characteristics and hypertension control

Bivariate analysis was conducted to test an association between patients' characteristics and hypertension control (Table 2). The results indicated that age (X^2 = 3.898; df = 1, p = .048), marital status (X^2 = 9.940, df = 1, p = .002), BMI (X^2 = 8.024, df = 3, p = .046) and income (X^22 = 4.994, df = 1, p = .025) were associated with hypertension control. Moreover, duration of hypertension (X^2 = 4.797, df = 1, p = .029), comorbidities (X^2 = 9.291, df = 1, p = .002), such as diabetes comorbidity (X^2 = 7.707, df = 1, p = .005) and cardiovascular disease comorbidities (X^2 = 3.895, df = 1, p = .048) were associated with controlled hypertension.

Table 2. Association between participants' characteristics and hypertension control

Variables	Hypertension control N (%)		df	x^2	*P*-value
	Yes	No			
Age			1	3.898	**.048***
≤64	26 (24.8)	79 (75.2)			
65+	24 (39.3)	37 (60.7)			
Gender			1	.573	.449
Female	41 (31.5)	89 (68.5)			
Male	9 (25)	27(75)			
Education			1	.350	.554
Primary school or less	38 (31.4)	83 (68.6)			
Secondary school or above	12 (26.7)	33 (73.3)			
Marital status			1	9.940	**.002****
Divorced/separated/widowed	29 (43.9)	37 (56.1)			
Married	21 (21.0)	79 (79.0)			
Employment			2	2.450	.294
Unemployed	9 (31.0)	20 (69.0)			
Farmer/ husbandry	36 (33)	73 (67)			
Employed	5 (17.9)	23 (82.1)			
Income				4.994	**.025***
≤28000 RwF (< $1day)	41 (35.3)	75 (64.7)	2		
>28000 RwF	9 (18.0)	41(82.0)			
Smoking				.239	.625
No	48(29.8)	113 (70.2)	1		
Yes	2 (40)	3 (60)			
Alcohol consumption			1	2.055	.152
No	46 (32.2)	97 (67.8)			
Yes	4 (17.4)	19 (82.6)			
BMI			3	8.024	**.046***
< 18.5: Underweight	4 (26.7)	11 (73.3)			
18.5 to < 25.0: Normal	30 (28.6)	75 (71.4)			
25 to < 30.0: Overweight	16 (44.4)	20 (55.6)			
≥ 30: Obese	0 (0)	10 (100)			
Duration of hypertension			1	4.797	**.029****
< 5 years	29 (25)	87 (75)			
≥ 5 years	21 (42)	29 (58)			
Diabetes			1	7.707	**.005****
No	37 (26.1)	105 (73.9)			
Yes	13 (54.2)	11 (45.8)			

*Statistical significance at p < .005; **Statistical significance at p < .01; ***Statistical significance at p <.001. Note. df: Degree of freedom, x^2 : chi-square

Table 2. Continued

Variables	Hypertension control N (%)		df	x^2	*P*-value
	Yes	No			
HIV/AIDS			1	.105	.746
No	48 (30.4)	110 (69.6)			
Yes	2 (25)	6 (75)			
Any cardiovascular disease			1	3.895	**.048***
No	34 (26.4)	95 (73.6)			
Yes	16 (43.2)	21 (56.8)			
Chronic respiratory diseases (asthma)			1	.296	.586
No	46 (30.3)	106 (69.7)			
Yes	3 (23.1)	10 (76.9)			
Co-morbidity			1	9.291	**.002****
No	20 (20.6)	77 (79.4)			
Yes	29 (42.6)	39 (57.4)			

*Statistical significance at p < .005; **Statistical significance at p < .01; ***Statistical significance at p <.001.
Note. df: Degree of freedom, x^2 : chi-square

Association between the quality of hypertension care process and hypertension control

As Table 3 shows, the results indicated that advice on alcohol intake reduction (x^2 = 8.654, df = 1, p = .003), advice on smoking cessation (= 8.449, df = 1, p = .004), taking lab exams for monitoring health status (x^2 = 7.226, df = 1, p = .007) were associated with hypertension control.

Other quality of care processes including hypertension lowering medication prescribed, advice about increasing physical activity, advice about low sodium diet intake and regular follow up blood pressure measurement at least once in three months were not associated with hypertension control. Overall, participants with controlled hypertension received higher quality of care process level (M = 6.42; SD = .84) compared to those with poor hypertension control (M = 5.62; SD = 1.52), t (155) = 4.336, p < .001.

Table 3. Association between the quality-of-care process and hypertension control

Variables		Blood Pressure Control		df		
	N	Yes	No		x^2	*P*-value
Any hypertension lowering medication prescribed				1	1.634	.201
Yes	157	49 (31.2)	108 (68.8)			
No	9	1 (11.1)	8 (88.9)			
Advice about increasing physical activity				1	.231	.631
Yes	122	38 (31.1)	84 (68.9)			
No	44	12 (27.3)	32 (72.7)			
Advice on alcohol intake reduction				1	8.654	***.003***
Yes	133	47(35.3)	86 (64.7)			
No	33	3 (9.1)	30 (90.9)			
Advice about smoking cessation				1	8.449	***.004***
Yes	138	48 (34.8)	90 (65.2)			
No	28	2 (7.1)	26 (92.9)			
Advice about low sodium diet intake				1	3.088	*.079*
Yes	158	49 (31)	109 (69)			
No	7	0 (0)	7 (100)			
Regular follow up blood pressure measurement at least once in 3 months				1	3.623	*.057*
Yes	158	50 (31.6)	108 (68.4)			
No	8	0 (0)	8 (100)			
Lab exam taken by health professionals for health monitoring				1	7.225	***.007***
Yes	107	0 (37.4)	67 (62.6)			
No	58	10 (17.2)	48 (82.8)			

Note: df = degree of freedom, x^2 = chi-square test

Predictors of hypertension control

As Table 4 shows, in step 1, age, marital status and income significantly contributed to 11.2% of total variance in hypertension control (Nagelkerke R square = .112, p = .004). In step 2, BMI, duration of hypertension and co-morbidity significantly added 14.1% and all variables explained 25.4% of total variance in hypertension control (Nagelkerke R square = .254, p < .001).

In step 3, quality of care process level was added and the whole model significantly explained 29.7% of total variance in hypertension control (Nagelkerke R square = .297, p < .001). Supplemental table indicates the results of all steps. The final model showed quality of care process level and comorbidity were predictors of hypertension control. As the quality of hypertension care process level increases by one unit, odds of hypertension control

increase by 61.4% with other variables held constant (OR = 1.6; 95% CI: 1.1- 2.4, p = .024). Furthermore, odds of hypertension control among participants with comorbidity were 2.3 times higher compared to participants with no comorbidity with other variables held constant (OR = 2.3; 95% CI:1.0-5.1, p = .039).

Table 4.Predictors of hypertension control

Variables	***P*-value**	**OR**	**95%CI for OR**	
			Lower	**Upper**
Step1				
Age				
≤ 64 years old (Ref.)				
Age_65+	.949	1.027	.456	2.311
Income				
≤28000RwF per month (Ref.)				
>28000 RwF per month	.081	2.440	.175	1.107
Marital status				
Alone: Widowed/divorced/separated/single (Ref.)				
Married	.146	.547	.243	1.233
Step2				
BMI_Normal (Ref.)				
BMI_underweight	.227	.442	.118	1.660
BMI_overweight	.184	1.845	.747	4.559
BMI_obese	.999	0.000	.000	
Duration of hypertension				
< 5 years (Ref.)				
≥5years	.401	1.417	.628	3.196
Comorbidity				
No comorbidity (Ref.)				
Comorbidity	**.039**	2.298	1.042	5.065
Step 3				
Quality of care process	**.024**	1.614	1.066	2.442
Constant	**.007**	.024		

Note: **Age_reference**_group: ≤ 64 years old; **BMI**_reference: normal; d**uration of hypertension**_ reference: < 5 years; **comorbidity reference**: No; income: ≤ 28000Rwf per month; **marital status**_ reference: Alone (widowed/divorced/separated/single). **OR**: Odds Ratio; **CI**: Confidence interval

Discussion

Our study examined the quality of hypertension care and hypertension control among patients with hypertension receiving non-communicable disease services in two health centres (primary health care centres) in Rwamagana district, Rwanda. The study found that the quality of hypertension care process offered to these patients was high with a mean score of 5.86 over possible seven scores.

However, hypertension control was poor with only 30.1% having their hypertension controlled. The results of this study are similar to the global findings which state that 21% of hypertensive patients have controlled hypertension.[10] The findings of this study also are congruent with the study conducted in primary care practices in the United States which found that 33.2% of patients had controlled blood pressure.[30]

Although our study indicated higher proportion of patients with controlled hypertension compared to that conducted in Eastern sub-Saharan Africa (30.1% vs 12%), [31] both studies showed poor hypertension control.

The findings of the current study are almost similar to studies which were carried out in Ethiopia, Kenya, Uganda and East and West Africa which indicated 46% to 47% having controlled hypertension.[11,32,33] In addition, our findings corroborate the study conducted in seven rural health centres of Burera, Kayonza and Kirehe districts of Rwanda which found that only 40% of hypertensive patients in non-communicable disease clinics had controlled hypertension. [19] These highlight the need for adequate primary care interventions to improve hypertension control. Without adequate primary care interventions for hypertension management and control, achieving the goal of reducing 25% of uncontrolled hypertension in Africa by 2025 [34] may be challenging.

Our study found an association between comorbidity and hypertension control with participants with comorbidity having better controlled hypertension compared to those without comorbidity. Our study findings are consistent with Danish and UK studies which showed a positive association between comorbidity and hypertension control.[30,35,36] Patients with comorbidity may have higher risk perceptions of cardiovascular diseases compared to those without comorbidity.[37,38] These patients may be motivated to engage in healthy behaviours and comply with management regimens that are essential for controlling their hypertension than their counterparts without comorbidity.[36,39,40]

In addition, health professionals might have focused their self-management support on patients with other chronic disease comorbidities to prevent cardiovascular diseases (CVDs) more than those with non-comorbidities.[36] In fact, a study carried out in the United States found that patients who were living with additional health conditions, such as diabetes, coronary artery diseases, and hyperlipidemia were more likely to get optimal hypertension care than those who were free from these comorbidities.[24] Patients with additional health problems such as diabetes, other CVDs might have engaged in other services that are impactful for both disease management. [24] This might be related to the fact that diabetes and cardiovascular diseases share common risk factors with hypertension and similar lifestyles have positive effects on both diabetes and hypertension. It is critical that tailored self-management support be offered to both participants with comorbidity and those with single chronic disease. Delivering individualized care could enable patients to engage in preventive care and prevent hypertension-related complications.

Our study found an association between quality of hypertension care and hypertension control with high quality of care process being associated with better hypertension control. Past works have shown a positive association between the quality of the hypertension care process and hypertension control.[4,24,25] Patients who receive required care processes such as counseling on reduction of alcohol intake, increasing physical activities and other processes develop enhanced knowledge and skills regarding hypertension management. These could result in increased confidence in their ability to manage their conditions and achieve better clinical and health outcomes. However, it is not clear whether quality of care is associated with intermediate outcomes such as self-efficacy for managing chronic diseases and whether self-efficacy is associated with self-management and hypertension control. Further research is warranted to assess the relationship between quality of hypertension care process and self-efficacy for managing chronic diseases, and association between self-efficacy and hypertension control among these population groups.

Other factors might have been implicated in hypertension control, particularly primary care practice characteristics. Although the quality of care process and hypertension control were different across two primary care settings—study sites (results not shown) with one site delivering a higher quality of care processes than another one, we did not investigate further this difference since it is beyond the scope of this study. Primary health care center factors that are associated with quality of care and hypertension control remain unclear. Further research could identify primary health care practices characteristics that influence the quality of hypertension care and hypertension control in a primary health care centers in Rwanda.

Investigating primary health care center characteristics that are associated with the quality of hypertension care and hypertension control could guide policymakers in the optimization of primary health centers in the management of hypertension in primary care centers. A mixed-methods large-scale nationwide study to examine the quality of care and hypertension control and perspectives of stakeholders in hypertension management in primary health centers in Rwanda is warranted. This could guide the organization of primary health care services delivery to appropriately support the management of hypertension in primary health care centers and improvement of patient outcomes. Investigating how technology could be leveraged in chronic disease management and control such as mobile phones in hypertension care services delivery in primary care could be another future research endeavor for health services and policy researchers in primary care in Rwanda. However, the results of this study should be interpreted with caution. The sample size was small which might have resulted in the lack of power to detect the effect size. Using a cross-sectional survey with convenience sampling might have introduced response bias. In addition, purposive selection of two health centres might have resulted in selection bias and results cannot be generalizable to the whole district. Nevertheless, the results of the study provide insight into the quality of hypertension care and hypertension control in primary health care centers in Rwamagana district and may serve as baseline information for further studies in Rwanda.

Conclusions

The study found that the quality of hypertension care processes was high with almost six over seven quality of care indicators being met. However, low proportions of patients had controlled hypertension in two health centres. Nevertheless, higher quality of hypertension care processes was associated with the likelihood of hypertension control. Comorbidity was associated with the likelihood of the hypertension control. Developing and implementing tailored individualized patient-centered care intervention considering comorbidity could improve hypertension control in primary health care centers in Rwanda.

Conflict of interest

There is no conflict of interest in this study either personal or financial from any organization that could influence the results of the study.

Authorship

IN: Contributed to the conception of the study, design the study, supervised data collection, data analysis, interpretation of results, drafting the work, revising it critically and approved the submission of the work. MM, JPN, EM and CA: Contributed to drafting a paper, critically reviewing the content of paper and approved the submission of the paper.

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