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Ana Baumann

Washington University in St. Louis

Cole Hooley

Brigham Young University - Provo

Charles Goss

Washington University School of Medicine in St. Louis

Vincent Mutabazi

Regional Alliance for Sustainable Development, Kigali, Rwanda

Angela Brown

Washington University School of Medicine in St. Louis

See next page for additional authors

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Authors

Ana Baumann, Cole Hooley, Charles Goss, Vincent Mutabazi, Angela Brown, Kenneth Schechtman, Marc Twagirumukiza, Lisa de Las Fuentes, Dominic Reeds, Makeda Williams, Eugene Mutimura, Anna Bergström, Aurore Nishimwe, Cecile Ingabire, and Victor Davila-Roman

BMJ Open Exploring contextual factors influencing the implementation of evidence-based care for hypertension in Rwanda: a cross-sectional study using the COACH questionnaire

Ana A Baumann ¹, Cole Hooley,² Charles W Goss,³ Vincent Mutabazi,⁴ Angela L Brown,⁵ Kenneth B Schechtman,⁶ Marc Twagirumukiza,^{4,7} Lisa de las Fuentes,^{8,9} Dominic Reeds,¹⁰ Makeda Williams,¹¹ Eugene Mutimura,^{4,12} Anna Bergström,¹³ Aurore Nishimwe,^{4,7} Cecile Ingabire,^{4,7} Victor G Davila-Roman⁵

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For numbered affiliations see end of article.

Correspondence to

Dr Victor G Davila-Roman;
vdavila@wustl.edu

ABSTRACT

Importance Hypertension is the largest contributor to the Global Burden of Disease. In Rwanda, as in most low-income and middle-income countries, an increasing prevalence of hypertension and its associated morbidity and mortality is causing major healthcare and economic impact. Understanding healthcare systems context in hypertension care is necessary.

Objective To study the hypertension healthcare context as perceived by healthcare providers using the Context Assessment for Community Health (COACH) tool.

Design A cross-sectional cohort responded to the COACH questionnaire and a survey about hypertension training.

Setting Three tertiary care hospitals in Rwanda.

Participants Healthcare professionals (n=223).

Primary outcome(s) and measure(s) The COACH tool consists of 49 items with eight subscales: resources, community engagement, commitment to work, informal payment, leadership, work culture, monitoring services for action (5-point Likert Scale) and sources of knowledge (on a 0–1 scale). Four questions surveyed training on hypertension.

Results Responders (n=223, 75% women; 56% aged 20–35 years) included nurses (n=142, 64%, midwives (n=42, 19%), primary care physicians (n=28, 13%) and physician specialists (n=11, 5%). The subscales commitment to work, leadership, work culture and informal payment scored between 4.7 and 4.1 and the community engagement, monitoring services for action and organizational resources scored between 3.1 and 3.5. Sources of knowledge had a mean score of 0.6±0.3. While 73% reported having attended a didactic hypertension seminar in the past year, only 28% had received long-term training and 51% had <3-year experience working with hypertension care delivery. The majority (99%) indicated a need for additional training in hypertension care.

Conclusions There is a need for increased and continuous training in Rwanda. Healthcare responders stated a commitment to work and reported supportive leadership, while acknowledging limited resources and no monitoring systems. The COACH tool provides

Strengths and limitations of the study

- A cross-sectional cohort of providers from three hospitals in Rwanda responded to the Context Assessment for Community Health (COACH) tool and a survey examining existing training in hypertension care.
- Respondents shared a high commitment to work and positive leadership, while indicating the need for more training in hypertension care and monitoring.
- Based on the COACH tool training, strategies are being codeveloped to implement a comprehensive and sustainable hypertension care programme in Rwanda.

contextual guidance to develop training strategies prior to the implementation of a sustainable hypertension care programme.

BACKGROUND

Hypertension is the most common disease in the world affecting globally over 1.2 billion people, is the largest contributor to the Global Burden of Disease and is the most prevalent risk factor for the development of cardiovascular disease (CVD).^{1–3} The overall global prevalence of hypertension exceeds 50% of adults older than 50 years and in low-income and middle-income countries (LMICs) ranges from 32% to 78%.^{4–7} Rwanda, located in sub-Saharan Africa, is an LMIC with 12.4 million relatively young people (those <34 years of age represent 78% of the population) and with a high population density.^{7 8} Rwanda is undergoing an epidemiological transition with an increasing coexistence of infectious diseases and non-communicable diseases (NCDs) including

hypertension.^{8 9} Epidemiologic data from Rwanda estimates a high prevalence of both hypertension and CVD, which together account for 36% of deaths.¹⁰ The 2015 Rwanda NCDs risk survey based on the WHO STEPwise Approach to Surveillance framework reported an overall hypertension prevalence of 15% (95% CI: 13.8 to 16.3) for those aged 15–64 years and 39% (95% CI: 35.7 to 43.1) for those aged 55–64 years, with deaths attributable to hypertension at 18/100 000.¹¹ These data are consistent with those of other sub-Saharan countries, reflecting the importance of hypertension as a public health burden in sub-Saharan Africa.¹²

While evidence-based intervention (EBI) studies have shown that treatment and control of hypertension decrease morbidity and mortality, barriers for the implementation of these interventions have been found at all healthcare levels, including systems, providers and patients.¹³ The application of dissemination and implementation (D&I) science allows for a rigorous and systematic approach to develop implementation strategies and improve the uptake of effective EBIs for hypertension care.¹⁴

Selection of implementation strategies, that is, methods to implement these EBIs in usual care, should be based on frameworks and on an understanding of the context where the intervention will be implemented.¹⁵ The Promoting Action on Research Implementation in Health Services (PARIHS) is a framework that outlines three core elements (evidence, context and facilitation) for successful EBI implementation.^{14 15} Context, defined as ‘the environment or setting in which the proposed change is to be implemented’, is comprised of three subelements: culture, leadership and evaluation, dimensions being evaluated in this study.^{14 15} The Context Assessment for Community Health (COACH), a validated theory-based tool aimed at examining healthcare contexts in LMICs, is a 49-item survey based on the context dimension of the PARIHS framework and the interconnected building blocks of the WHO.¹⁶ The COACH tool was developed to identify barriers for EBI implementation, to guide planning and adaptation of the strategies to increase the uptake of the EBIs and to link contextual characteristics to outcome indicators of healthcare interventions.¹⁶ Due to its theoretical base and its acceptable reliability and validity among providers in a variety of LMICs including Vietnam, Bangladesh, Uganda, South Africa and Nicaragua,^{16 17} COACH was used in the present study to examine the context of hypertension care as reported by healthcare providers from three hospitals in Rwanda.

METHODS

Study setting

The study was conducted at three hospitals (two district, one provincial) in Rwanda; to maintain the confidentiality of participants, the hospitals are identified as A, B and C.

Participants

Participants were healthcare providers working in the included hospitals. Lists of all medical professional staff (nursing, midwives, physicians) were provided by the hospital administrations to the study team; from these lists, study participants were contacted to participate in the study. All those who were contacted agreed to participate, signed informed consent and subsequently underwent in-person interviews to complete the survey.

Questions about provider training in hypertension

A separate survey asked healthcare providers four questions regarding training in hypertension care: (1) have you received didactic or school-based training on hypertension? (response options for first three questions: in the past year, before the past year, never); (2) have you received a structured long-term (>1-month course) training on hypertension?; (3) have you received on-job training, in service or supervision on the management of hypertension? and (4) do you feel there is need for additional training in the management of hypertension? (response options: yes, no/not sure).

Questions about healthcare system context

The COACH tool consists of 49 questions across eight subscales. Organizational resources refers to the availability of human capacity and materials that allow an organisation to implement an intervention successfully. Community engagement refers to mutual communication and activities that occur between community members and the organisation. Monitoring refers to the process of using locally derived data to evaluate performance and plans to improve outcomes. Sources of knowledge refers to the availability and use of sources of facts, information and skills acquired by providers through experience or education in an organisation that facilitate best practice. Commitment to work refers to an individual identification with and involvement in an organisation. Work culture refers to the process of an organisation, reflecting a shared set of values, ideas, concepts and rules of behaviour that allow the organisation to function. Leadership refers to the actions of a person in the organisation who can influence change and excellence in practice, achieved through clarity and engagement. Informal payment refers to bribe and/or benefits given to an individual outside of the officially accepted arrangements.¹⁶ Respondents were asked to rate their level of agreement using a 5-point Likert Scale for all items, except for items in the sources of knowledge subscale where the scale is from 0 to 1, regarding the use of the hypertension guidelines within a specified time frame and the availability of different sources of knowledge.

Translation and adaptation of COACH tool

The majority of healthcare workers in Rwanda do not routinely communicate in English. For this reason, the COACH tool was translated from English to Kinyarwanda (study participants’ daily language) and subsequently

back translated to English by two Rwandan bilingual experts in both English and Kinyarwanda, following the WHO guidelines for translation of assessments¹⁸ to ensure the accuracy of the translation. Items that needed further clarification after pilot testing were discussed with the tool developer and agreement on the translation was reached by consensus. Additionally, we adapted the questions to be specific in relation to hypertension care (eg, 'This facility is willing to use new healthcare practices such as guidelines and recommendations for HTN').

Patient and public involvement

The COACH questionnaire has been previously validated in LMICs and was modified by the research team to address the context of hypertension in Rwanda through our weekly calls. The Rwandan coinvestigators had primary responsibility for the translation (English to Kinyarwanda) and back translation of the COACH questionnaire and for development, recruitment and conduction of the study. Patients were not involved in the development, recruitment or conduction of the study. The results of this study have been shared with stakeholders in Rwanda through our yearly meetings. Additional dissemination with the ministry of health, academic institutions, healthcare providers and others will occur once the manuscript is published.

Data collection

Data were collected by in-person interviews, using structured questionnaires in paper and pencil format, and subsequently transferred in duplicate entry to Qualtrics by members of the research team. There were no missing values for any of the questions and any discrepancies in data entry were resolved. The survey was administered between 27 May and 4 June 2019.

Analysis

Demographics are reported as the total number of respondents and percentage in each group. Differences among hospitals were assessed using χ^2 tests or Fisher's exact tests as appropriate. COACH dimensions are

reported as means \pm SD, for each hospital and combined across all hospitals. Cronbach's α , a coefficient of reliability, was used to determine internal consistency of the test items and the average intercorrelation between the items in each dimension. Scoring of sources of knowledge dimension ranged from 0 (not available, never/rarely), 0.5 (occasionally) to 1 (frequently/always); scoring for the other subscales ranged from 1 (strongly disagree) to 5 (strongly agree). The first six items in the informal payment dimension were reverse scored so that the directional interpretation was similar to the other dimensions.

A one-way analysis of variance was used to test for differences in mean dimension scores among the three hospitals. All analyses were conducted using SAS V.9.4 (SAS Institute) and *p* values<0.05 were considered significant.

RESULTS

The total number of respondents (n=223) included nurses, midwives, primary care physicians and specialty physicians, with approximately similar representation obtained from all three hospitals (table 1). The majority of respondents were female, relatively young, had nursing or midwife degrees and had limited experience working in hypertension care. The hospitals differed in terms of number of years of experience of the healthcare providers working in hypertension care (*p*=0.003).

Training in hypertension

Results of the perspectives of healthcare providers regarding training in hypertension care show that nearly all respondents (99%) have participated in a didactic or school-based training on hypertension at some point during their training and/or career (either in the past year or before the past year, table 2). Almost half (44%) of respondents stated having participated in long-term training (ie, >1-month course) on hypertension (either in the past year or before the past year) and a significant majority (72%) had received on-job training, in service or supervision on the management of hypertension at some

Table 1 Participant demographics reported as n (%)

Variable	Group	All (N=223)	Hospital A (N=74)	Hospital B (N=70)	Hospital C (N=79)	P value
Age (years)	20–35	125 (56%)	40 (54%)	40 (57%)	45 (57%)	0.914
	≥36	98 (44%)	34 (46%)	30 (43%)	34 (43%)	
Gender	Female	168 (75%)	51 (69%)	53 (76%)	64 (81%)	0.2
Education	Nurse	142 (64%)	46 (62%)	47 (67%)	49 (62%)	0.811
	Midwife	42 (19%)	17 (23%)	11 (16%)	14 (18%)	
	Primary care physician	28 (13%)	9 (12%)	9 (13%)	10 (13%)	
	Physician specialist	11 (5%)	2 (3%)	3 (4%)	6 (8%)	
Experience working in hypertension care (years)	0–3	114 (51%)	32 (43%)	28 (40%)	54 (68%)	0.003
	4–9	64 (29%)	27 (37%)	22 (31%)	15 (19%)	
	≥10	45 (20%)	15 (20%)	20 (29%)	10 (13%)	

**Table 2** Participant hypertension training history reported as number and per cent of those responding 'yes'

Variable	All (N=223)	Hospital A (N=74)	Hospital B (N=70)	Hospital C (N=79)	P value
Have you received didactic or school-based training on hypertension?					
a. In the past year	72 (32%)	34 (46%)	24 (34%)	14 (18%)	<0.001
b. Before the past year	162 (73%)	42 (57%)	51 (73%)	69 (87%)	<0.001
c. Never	3 (1%)	2 (3%)	1 (1%)	0	0.311
Have you received a structured long-term (>1-month course) training on hypertension?					
a. In the past year	41 (18%)	18 (24%)	9 (13%)	14 (18%)	0.203
b. Before the past year	58 (26%)	28 (38%)	16 (23%)	14 (18%)	0.014
c. Never	160 (72%)	45 (61%)	54 (77%)	61 (77%)	0.038
Have you received on-job training, in service or supervision on the management of hypertension?					
a. In the past year	81 (36%)	33 (45%)	30 (43%)	18 (23%)	0.008
b. Before the past year	79 (36%)	31 (42%)	26 (37%)	22 (28%)	0.18
c. Never	109 (49%)	29 (39%)	29 (41%)	51 (65%)	0.002
Do you feel there is need for additional training in the management of hypertension?					
Yes	220 (99%)	73 (99%)	70 (100%)	77 (97%)	0.776

Note. Responses may vary in total numbers because participants were given the option to check all that apply.

time in their career (either in the past year or before the past year).

The level of training in hypertension care delivery varied by hospital, showing statistically significant differences in having received didactic or school-based training on hypertension in the past year and before the past year ($p < 0.001$ for both), in having received long-term training (>1 month) before the past year ($p = 0.014$) and having received on-job training, in service or supervision on the management of hypertension in the past year ($p = 0.008$) and never ($p = 0.002$). Finally, almost all respondents reported the need for additional training in hypertension (99%) without statistically significant differences between hospitals.

Internal reliability of COACH tool

Overall, the COACH tool showed very good to high internal consistency (Cronbach's α range: 0.57–0.92; table 3) with all but three dimensions exceeding the accepted standard for satisfactory internal reliability of >0.70 for new scales. The highest Cronbach's α estimate (0.92) was for leadership subscale and the lowest (0.57) was for informal payment subscale. After removal of two items from the informal payments subscale (ie, 'Efforts are made to stop clients from providing informal payment to get appropriate healthcare services in hypertension' and 'Efforts are made to stop health workers from asking clients for informal payment for hypertension'), Cronbach's α increased to 0.74. Similarly, for the work culture subscale, removal of one item (ie, 'This facility helps me to improve and develop my skills in hypertension') resulted in a Cronbach's α increase from 0.69 to 0.75. Finally, for sources of knowledge subscale, removal of any of the constituent items did not improve Cronbach's α from 0.67.

COACH subscales

Table 4 shows the mean and SDs for the scales across hospitals. There were significant differences in the mean scores across hospitals between the organizational

Table 3 Cronbach's α estimates for the different COACH dimensions

Dimension	Items	Score range	Cronbach's α
Organizational resources	11	1–5	0.83
Community engagement	5	1–5	0.80
Monitoring services for action	5	1–5	0.74
Commitment to work	3	1–5	0.77
Work culture	6	1–5	0.69
Work culture, with questions removed*	5	1–5	0.75
Leadership	6	1–5	0.92
Informal payment	8	1–5	0.57
Informal payment, with questions removed†	6	1–5	0.74
Sources of knowledge	5	0–1	0.67

*Item: 'This facility helps me to improve and develop my skills in hypertension' removed.

†Items: 'Efforts are made to stop clients from providing informal payment to get appropriate healthcare services in hypertension' and 'Efforts are made to stop health workers from asking clients for informal payment for hypertension' were removed.
COACH, Context Assessment for Community Health.

Table 4 Overall mean±SD and by hospital for the COACH subscales

Dimensions	All (N=223)	Hospital A (N=74)	Hospital B (N=70)	Hospital C (N=79)	P value
Organizational resources	3.1±0.6	3.3±0.8	2.9±0.5	3.1±0.5	<0.001
Human resources	2.6±1.0	3.2±1.1	2.4±0.9	2.3±0.8	<0.001
Space	3.0±1.1	3.2±1.2	2.7±1.1	3.0±1.1	0.032
Communication and transport	3.3±1.0	3.3±1.1	3.2±1.0	3.4±0.8	0.699
Financing	2.9±0.7	3.1±0.8	2.7±0.6	2.9±0.5	<0.001
Medicines and equipment	3.3±0.8	3.4±0.9	3.0±0.7	3.5±0.7	<0.001
Community engagement	3.5±0.7	3.5±0.8	3.4±0.7	3.6±0.5	0.118
Monitoring services for action	3.2±0.6	3.3±0.8	3.0±0.6	3.2±0.5	0.001
Commitment to work	4.2±0.7	4.3±0.6	4.2±0.7	4.1±0.8	0.155
Work culture	4.1±0.5	4.0±0.7	4.0±0.5	4.3±0.4	0.002
Culture of learning and change	3.8±0.6	3.8±0.7	3.8±0.7	3.7±0.5	0.768
Culture of responsibility	4.1±0.6	4.0±0.8	4.0±0.5	4.4±0.4	<0.001
Leadership	4.1±0.7	4.1±0.8	4.3±0.5	3.9±0.7	0.01
Informal payment	4.7±0.5	4.5±0.6	4.7±0.4	4.8±0.3	0.003
Accountability	2.8±1.5	2.7±1.5	3.5±1.3	2.3±1.3	<0.001
Informal payment*	4.7±0.5	4.6±0.6	4.8±0.4	4.8±0.3	0.002
Nepotism*	4.6±0.6	4.5±0.7	4.6±0.6	4.7±0.6	0.087
Sources of knowledge†	0.6±0.3	0.6±0.3	0.5±0.3	0.7±0.3	0.003

All values represent mean±SD. Bolded items indicate COACH subscales; those below the subscales indicate the dimensions within the subscales.

*Items on informal payment and nepotism were reverse scored.

†Score range for sources of knowledge is 0–1; for all other subscales the score range is 1–5.

COACH, Context Assessment for Community Health.

resources, monitoring services, sources of knowledge, work culture, leadership and informal payment subscales.

The organizational resources received a mean score of 3.1, suggesting that respondents were overall neutral about this scale (tables 4 and 5). The majority of respondents agreed with only 3 of the 11 dimensions, including ‘facility has access to transport and fuel that are needed to provide healthcare services for HTN’ (50% agreed), ‘facility has access to the communication tools that are needed to provide healthcare services for HTN’ (54% agreed) and ‘facility has enough disposable medical equipment to provide healthcare services for HTN’ (83% agreed). For the remaining eight dimensions, greater than 50% of respondents were either neutral or disagreed with the dimensions dealing with human resources, space, medicine and equipment and financing, suggesting that there is room for improvement in these areas.

The community engagement received a mean score of 3.5, suggesting that respondents were slightly more favourable than neutral about the commitment of their hospitals towards their community (table 5). In fact, four of the five dimensions had more than half of the respondents agreeing with community engagement in hypertension care, with only one dimension, ‘in this facility, we encourage other organizations to contribute to improving HTN in the community’ showing a majority being either neutral (36%) or disapproving (27%).

The monitoring services for action received a mean score of 3.2, suggesting that respondents were neutral about the use of locally derived data to evaluate the performance and plans to improve hypertension care. Of the five dimensions, only one, ‘this facility regularly compares its work with national or other guidelines for HTN’ (61%) showed agreement by more than half of the respondents.

The commitment to work received a mean score of 4.2, suggesting that respondents are committed to their hospitals. All three dimensions showed approval by a significant majority (ranging from 70% to 94%).

The leadership subscale received a mean score of 4.1, suggesting that respondents are supportive of their leadership. All six dimensions had more than half of the respondents (81%–92%) agreeing with high remarks for their leadership.

The informal payment received a mean score of 4.7, suggesting that respondents do not have concerns with informal payments, nepotism or accountability. In fact, in six of the eight dimensions, more than half of the respondents (83%–98%) indicated no concerns with these issues. However, in the dimension of accountability, the low mean score of 2.8 is also reflected by a majority of combined neutral and disagree responses regarding ‘efforts are made to stop clients from providing informal payment to get appropriate healthcare services in HTN’ (22% and 44%,

Table 5 Descriptive values of items and dimensions of the COACH tool in Rwanda (N=223)

Scaled dimensions/items	Mean	Median	Disagree	Neutral	Agree
Organizational resources	3.1	3.0	-	-	-
Human resources	2.6	2.5	-	-	-
This facility has enough workers with the right training and skills to do everything that needs to be done for hypertension	2.7	2.0	121 (54%)	43 (19%)	59 (27%)
This facility has enough workers with the right training and skills to do their job in the best possible way for hypertension	2.6	2.0	123 (55%)	41 (18%)	59 (27%)
Space	3.0	3.0	-	-	-
This facility has enough space to provide healthcare services for HTN	3.0	3.0	96 (43%)	29 (13%)	98 (44%)
Communication and transport	3.3	3.5	-	-	-
This facility has access to the transport and fuel that are needed to provide healthcare services for hypertension	3.3	4.0	60 (27%)	51 (23%)	112 (50%)
This facility has access to the communication tools (eg, telephones or radios) that are needed to provide healthcare services for hypertension	3.3	4.0	65 (29%)	37 (17%)	121 (54%)
Financing	2.9	3.0	-	-	-
This facility receives money according to a budget for hypertension	2.9	3.0	42 (19%)	153 (69%)	28 (13%)
This facility has money that we can decide how to use for hypertension	2.9	3.0	52 (23%)	140 (63%)	31 (14%)
Medicines and equipment	3.3	3.5	-	-	-
This facility has enough medicine to provide healthcare services for hypertension	3.1	3.0	81 (36%)	39 (18%)	103 (46%)
This facility has enough functional equipment to provide healthcare services for hypertension	3.1	3.0	80 (35.9%)	38 (17%)	105 (47%)
This facility has enough disposable medical equipment, such as syringes, gloves and needles to provide healthcare services for hypertension	4.0	4.0	24 (11%)	15 (7%)	184 (83%)
If the workload increases, the facility can get additional resources such as medicine and equipment for hypertension	3.1	3.0	59 (27%)	84 (38%)	80 (36%)
Community engagement	3.5	3.6	-	-	-
In this facility, we ask community members what they think about the healthcare services that we provide for hypertension	3.3	4.0	46 (21%)	63 (28%)	114 (51%)
In this facility, we listen to what community members think about the healthcare services we provide for hypertension	3.7	4.0	30 (14%)	41 (18%)	152 (68%)
In this facility, we have meetings with community members to discuss health matters regarding hypertension	3.6	4.0	30 (14%)	48 (22%)	145 (65%)
In this facility, we encourage community members to contribute to improving hypertension in the community	3.7	4.0	29 (13%)	33 (15%)	161 (72%)
In this facility, we encourage other organizations to contribute to improving hypertension in the community	3.3	3.0	44 (20%)	81 (36%)	98 (44%)

Continued

Table 5 Continued

Scaled dimensions/items	Mean	Median	Disagree	Neutral	Agree
Monitoring services for action	3.2	3.2	–	–	–
I receive regular updates about the facility's performance on hypertension based on information/data collected from our facility	2.7	3.0	110 (49%)	51 (23%)	62 (28%)
This facility discusses information/data from our facility on hypertension in a regular, formal way, such as in regularly scheduled meetings	3.2	3.0	60 (27%)	73 (33%)	90 (41%)
This facility regularly uses facility information/data to make plans for improving its healthcare services for hypertension	3.1	3.0	41 (18%)	108 (48%)	74 (33%)
This facility regularly monitors its work by comparing it with the facility's action plans for hypertension	3.2	3.0	30 (14%)	117 (53%)	76 (34%)
This facility regularly compares its work with national or other guidelines for hypertension	3.6	4.0	19 (9%)	68 (31%)	136 (61%)
Commitment to work	4.2	4.3	–	–	–
I am proud to work in this facility	4.0	4.0	16 (7%)	24 (11%)	183 (82%)
I am satisfied to work in this facility	3.9	4.0	24 (11%)	23 (10%)	176 (79%)
I feel encouraged to do my very best at work	4.6	5.0	6 (3%)	8 (4%)	209 (94%)
Work culture	4.1	4.2	–	–	–
Culture of learning and change	3.8	3.7	–	–	–
This facility is willing to use new healthcare practices such as guidelines and recommendations for hypertension	3.9	4.0	8 (4%)	45 (20%)	170 (76%)
This facility helps me to improve and develop my skills in hypertension	3.1	3.0	87 (39%)	37 (17%)	99 (44%)
I am encouraged to seek new information on healthcare practices for hypertension	4.4	4.0	7 (3%)	13 (6%)	203 (91%)
Culture of responsibility	4.1	4.0	–	–	–
This facility works for the good of the clients and puts their needs first in treatment of hypertension	3.8	4.0	17 (8%)	51 (23%)	155 (70%)
Members of the facility feel personally responsible for improving healthcare services for hypertension	4.2	4.0	3 (1%)	34 (15%)	186 (83%)
Members of the facility approach clients with hypertension with respect	4.4	4.0	3 (1%)	10 (5%)	210 (94%)
Leadership	4.1	4.0	–	–	–
I trust the facility leader	4.2	4.0	9 (4%)	11 (5%)	203 (91%)
The leader handles stressful situations calmly	4.0	4.0	13 (6%)	26 (12%)	184 (83%)
The leader actively listens, acknowledges, and then responds to requests and concerns	4.0	4.0	14 (6%)	22 (10%)	187 (84%)
The leader effectively resolves any conflicts that arise	4.1	4.0	9 (4%)	16 (7%)	198 (89%)
The leader encourages the introduction of new ideas and practices	4.2	4.0	6 (3%)	13 (6%)	204 (92%)
The leader makes things happen	4.0	4.0	11 (5%)	32 (14%)	180 (81%)

Continued

Table 5 Continued

Scaled dimensions/items	Mean	Median	Disagree	Neutral	Agree
Informal payment	4.7	5.0	–	–	–
Clients must always give informal payment to health workers to access healthcare services for hypertension	4.9	5.0	1 (0.4%)	3 (1%)	219 (98%)
Clients are treated more quickly if they make informal payments to health workers for hypertension	4.9	5.0	3 (1%)	5 (2%)	215 (96%)
Medicines or equipment for hypertension that should be available for free to clients have been sold in this facility	4.6	5.0	5 (2%)	24 (11%)	194 (87%)
Health workers are sometimes absent from work earning money at other places	4.5	5.0	5 (2%)	34 (15%)	184 (83%)
Nepotism	4.6	5.0	–	–	–
Health workers in this facility give healthcare services for hypertension to friends and family first	4.7	5.0	4 (2%)	10 (5%)	209 (94%)
Health workers in this facility give jobs or other benefits to friends and family first	4.5	5.0	10 (5%)	28 (13%)	185 (83%)
Accountability	2.8	3.0	–	–	–
Efforts are made to stop clients from providing informal payment to get appropriate healthcare services in hypertension	2.8	3.0	99 (44%)	49 (22%)	75 (34%)
Efforts are made to stop health workers from asking clients for informal payment for HTN	2.8	3.0	97 (44%)	40 (18%)	86 (39%)
Non-scaled dimension/items	Mean	Median	Not Appropriate (NA), never, rarely	Occasionally	Frequently, always
Sources of knowledge	0.6	0.6	–	–	–
Clinical practice guidelines for hypertension	0.7	1.0	52 (23%)	35 (16%)	136 (61%)
Other printed material for work (eg, textbooks, journals) with hypertension	0.6	1.0	58 (26%)	45 (20%)	120 (54%)
In-service training/workshops/courses for hypertension	0.5	0.5	102 (46%)	41 (18%)	80 (36%)
The internet for hypertension	0.6	0.5	65 (29%)	47 (21%)	111 (50%)
Electronic decision support (eg, mobile phone applications or other electronic devices to assist with care and decision-making) for hypertension	0.5	0.5	105 (47%)	28 (13%)	90 (40%)

COACH, Context Assessment for Community Health.

respectively) and ‘efforts are made to stop health workers from asking clients for informal payment for HTN’ (18% and 44%, respectively).

The sources of knowledge received a mean score of 0.6 (scale range: range 0–1), with discordant result in three of the five dimensions: while a majority agreed that they have access to information regarding hypertension guidelines, stating agreement for ‘clinical practice guidelines for HTN’ (61%), ‘printed material for work with HTN’ (54%) and use of ‘internet for HTN’ (50%), the majority responded with either occasionally or never/rarely responses regarding ‘in-service training/workshops/courses for HTN’ (18% and 46%, respectively) and ‘electronic decision support for HTN’ (13% and 47%, respectively).

DISCUSSION

The purpose of this study was to examine the contextual factors influencing hypertension care at three provincial/district hospitals in Rwanda, ascertained after completion of the COACH tool, a survey validated for use in LMIC, and a questionnaire about training in hypertension. The main findings of the study indicate an overwhelming agreement from the majority of respondents for increased and/or continuous training in hypertension care, as ascertained in the training questionnaire and in the COACH knowledge and organizational resources subscales.

Our research team has been collaborating with health-care providers from these hospitals for several years prior to survey, which may explain the high scores in the work culture and leadership subscales. While healthcare respondents in general stated a commitment to work and reported supportive leadership, the lower scores in the resources and monitoring services scales indicate challenges and opportunities for growth in these areas. In other words, even with such strong leadership in support of hypertension care, only about half of the respondents agreed with items that stated that the hospital had enough workers with the proper training and skills for HTN care. Additionally, the low scores on the monitoring subscale indicate that respondents believe that the hospital could improve evaluations of personnel performance with the purpose of improving hypertension outcomes.

These findings provide us with contextual guidance for the development of training strategies prior to the implementation of a comprehensive and sustainable hypertension care programme in Rwanda. That is, based on the data, the training programme should focus on providing further knowledge and understanding of the hypertension guidelines and on developing strategies to increase human capacity and monitoring of skills around hypertension care in these hospitals. The results indicate that we need to develop implementation strategies to support hypertension care in these hospitals and to think about how to increase skills on hypertension care and establish a monitoring system to support guideline adherence. The findings of this study reflect a larger historical context in Rwanda, with a shortage of trained physicians trained,

especially after the 1996 genocide.¹⁹ Accordingly, recently there has been a national movement for nurse-led task sharing of HTN care.^{19 20}

The findings of the COACH tool will guide our next steps in developing capacity building strategies and supporting the hospitals in establishing monitoring systems for HTN care. However, the informal payment and sources of knowledge subscales exhibited low Cronbach’s α internal reliability scores. Other studies have found similar challenges with these subscales indicating that additional work is needed in these subscales.²¹ Regarding the subscale work culture, it is unclear why the item ‘This facility helps me to improve and develop my skills in hypertension’ was challenging in our study. Further cognitive interview with the Kinyarwanda translation of the tool is needed to understand challenges with this item.

There were significant differences in the mean scores across hospitals between the organizational resources, monitoring services, sources of knowledge, work culture, leadership and informal payment subscales, indicating the tool’s ability to identify differences in these contextual factors. Assessment of the context of three hospitals provides guidance for our next training, selection and adaptation of implementation strategies to improve hypertension care in three hospitals in Rwanda. The overall good validity of the COACH tool indicates that it is comprehensible in Kinyarwanda and able to capture differences across settings.

The COACH tool was originally developed in five LMICs (Bangladesh, Vietnam, Uganda, South Africa, Nicaragua) and more recently applied in Mozambique to assess health-care context and its potential use for integration of EBIs and to develop their implementation in clinical practice in LMICs.^{16 17} The internal consistency of the COACH tool in a sample of providers in Rwanda, a different country from where the tool was developed and tested, show its utility to measure contextual dimensions in another LMIC. As this study is part of long-term capacity building efforts to strengthening D&I science and hypertension science in Rwanda, our team is currently supporting the development of several studies, led by investigators in Rwanda, to examine implementation strategies to support the hypertension care in these hospitals.

Limitations of the study

While we gathered important information for our next steps in terms of context and the need for additional training in hypertension care, we did not examine the specific areas where the respondents need training in terms of hypertension care (eg, epidemiology, diagnosis, treatment). To further examine the hypertension care in these hospitals, we will gather qualitative data through focus groups with our stakeholders. Additionally, while between hospitals analyses of the scores were done, our team is unable to report these to avoid breach of confidentiality. This information has been shared with hospital leadership in a confidential manner so they can incorporate and support hypertension training in their strategic planning. Finally, the internal

consistency of the COACH subscales after removal of the items was satisfactory, but further studies need to examine the challenges in the informal payment subscale and its low Cronbach's α , also reported in other studies.¹⁷

CONCLUSIONS

Contextual measures related to hypertension care in Rwanda shows a need for increased and/or continuous training. Healthcare responders stated a general commitment to work and reported supportive leadership while acknowledging challenges with resources and monitoring services. The COACH tool provides contextual guidance for the development of training strategies prior to the implementation of a comprehensive and sustainable hypertension care programme in Rwanda.

Author affiliations

- ¹Brown School of Social Work, Washington University in St. Louis, St. Louis, Missouri, USA
²School of Social Work, Brigham Young University, Provo, Utah, USA
³Division of Biostatistics, Washington University in St. Louis, St. Louis, Missouri, USA
⁴Regional Alliance for Sustainable Development, Kigali, Rwanda
⁵Cardiovascular Division, Department of Medicine, Washington University in St. Louis, St. Louis, Missouri, USA
⁶Division of Biostatistics, Washington University in St. Louis, St. Louis, Missouri, USA
⁷College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda
⁸Washington University in St. Louis, Division of Biostatistics, St. Louis, MO, USA
⁹Washington University in St. Louis, School of Medicine, Cardiovascular Division, Department of Medicine, St. Louis, MO, USA
¹⁰Center for Human Nutrition, Division of Geriatrics and Nutritional Science, Department of Medicine, St. Louis, MO, USA
¹¹National Heart Lung and Blood Institute, Bethesda, Maryland, USA
¹²National Council for Science and Technology, Kigali, Rwanda and to Regional Alliance for Sustainable Development, Kigali, Rwanda
¹³Uppsala Global Health Research on Implementation and Sustainability (UGHRIS), Dept of Women's and Children's Health, Uppsala Universitet, Uppsala, Sweden

Twitter Ana A Baumann @BaumannAna and Cole Hooley @cole_hooley

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Contributors All authors conceptualised the study. ABaumann, CH and VM organised the survey. VM led Context Assessment for Community Health tool translation and back translation and was responsible for data collection. CH was responsible for data management. CWG was responsible for data analysis. ABaumann, CH, CWG and VGD-R drafted initial version of manuscript. All coauthors read, contributed to and approved the final manuscript.

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ORCID iD

Ana A Baumann <http://orcid.org/0000-0002-4523-0147>

REFERENCES

- GBD 2017 Risk Factor Collaborators. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990-2017: a systematic analysis for the global burden of disease study 2017. *Lancet* 2018;392:1923-94.
- Roth GA, Mensah GA, Johnson CO, et al. Global burden of cardiovascular diseases and risk factors, 1990-2019: update from the GBD 2019 study. *J Am Coll Cardiol* 2020;76:2982-3021.
- Unger T, Borghi C, Charchar F, Thomas U, Claudio B, Fadi C, et al. 2020 International Society of hypertension global hypertension practice guidelines. *Hypertension* 2020;75:1334-57.
- WHO. Raised blood pressure. WHO, 2020. Available: https://www.who.int/gho/ncd/risk_factors/blood_pressure_prevalence_text/en/
- Lloyd-Sherlock P, Beard J, Minicuci N, et al. Hypertension among older adults in low- and middle-income countries: prevalence, awareness and control. *Int J Epidemiol* 2014;43:116-28.
- Forouzanfar MH, Liu P, Roth GA, et al. Global burden of hypertension and systolic blood pressure of at least 110 to 115 MM Hg, 1990-2015. *JAMA* 2017;317:165-82.
- Nahimana M-R, Nyandwi A, Muhimpundu MA, et al. A population-based national estimate of the prevalence and risk factors associated with hypertension in Rwanda: implications for prevention and control. *BMC Public Health* 2017;18:2.
- Rwanda Ministry of Health. Ministry of health, 2020. Available: <https://www.moh.gov.rw/>
- Twagirumukiza M, De Bacquer D, Kips JG, et al. Current and projected prevalence of arterial hypertension in sub-Saharan Africa by sex, age and habitat: an estimate from population studies. *J Hypertens* 2011;29:1243-52.
- NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19.1 million participants. *Lancet* 2017;389:37-55.
- World Health Organization. World Health rankings. World life expectancy, 2016. Available: <https://www.worldlifeexpectancy.com/world-health-rankings>
- de Ramirez SS, Enquobahrie DA, Nyadzi G, et al. Prevalence and correlates of hypertension: a cross-sectional study among rural populations in sub-Saharan Africa. *J Hum Hypertens* 2010;24:786-95.
- Baumann A, Hooley C, Mutabazi V. Training implementation research in Rwanda: evaluation, challenges and lessons learned. in: *AcademyHealth*, 2019. Available: <https://academyhealth.confex.com/academyhealth/2019di/meetingapp.cgi/Paper/35206>
- Kirchner JE, Smith JL, Powell BJ, et al. Getting a clinical innovation into practice: an introduction to implementation strategies. *Psychiatry Res* 2020;283:112467.
- Powell BJ, Beidas RS, Lewis CC, et al. Methods to improve the selection and tailoring of implementation strategies. *J Behav Health Serv Res* 2017;44:177-94.
- Bergström A, Skeen S, Duc DM, et al. Health system context and implementation of evidence-based practices-development and validation of the context assessment for community health (coach) tool for low- and middle-income settings. *Implement Sci* 2015;10:120.
- Duc DM, Bergström A, Eriksson L, et al. Response process and test-retest reliability of the context assessment for community health tool in Vietnam. *Glob Health Action* 2016;9:31572.
- World Health Organization. WHO | process of translation and adaptation of instruments. WHO, 2021. Available: https://www.who.int/substance_abuse/research_tools/translation/en/
- Niyonsenga SP, Park PH, Ngoga G, et al. Implementation outcomes of national decentralization of integrated outpatient services for

- severe non-communicable diseases to district hospitals in Rwanda. *Trop Med Int Health* 2021;26:953–61.
- 20 Tapela NM, Bukhman G, Ngoga G, *et al.* Treatment of non-communicable disease in rural resource-constrained settings: a comprehensive, integrated, nurse-led care model at public facilities in Rwanda. *Lancet Glob Health* 2015;3:S36.
- 21 Mocumbi S, McKee K, Munguambe K, *et al.* Ready to deliver maternal and newborn care? Health providers' perceptions of their work context in rural Mozambique. *Glob Health Action* 2018;11:1532631.