BMJ Open

Hypertension prevalence, associated factors, treatment and control in rural Cameroon: a cross-sectional study

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To cite: Simo LP, Agbor VN, Noubiap JJN, *et al*. Hypertension prevalence, associated factors, treatment and control in rural Cameroon: a cross-sectional study. *BMJ Open* 2020;**10**:e040981. doi:10.1136/bmjopen-2020-040981

► Prepublication history for this paper is available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2020-040981).

Received 28 May 2020
Revised 03 July 2020
Accepted 16 July 2020

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ABSTRACT

Introduction Sub-Saharan Africa is experiencing a surge in the burden of hypertension, and rural communities are increasingly affected by the epidemic.

Objectives We aimed to determine the prevalence of and factors associated with hypertension in rural communities of the Baham Health District (BHD), Cameroon. In addition, we sought to assess awareness, treatment and control rates of hypertension among community members.

Design A community-based cross-sectional study.

Setting Participants from five health areas in the BHD were recruited from August to October 2018.

Participants Consenting participants aged 18 years and above were included.

Results We included 526 participants in this study. The median age of the participants was 53.0 (IQR=35–65) years and 67.1% were female. The crude prevalence of hypertension was 40.9% (95% CI=36.7–45.1) with no gender disparity. The age-standardised prevalence of hypertension was 23.9% (95% CI=20.3–27.5). Five-year increase in age (adjusted OR (AOR)=1.34; 95% CI=1.23–1.44), family history of hypertension (AOR=2.22; 95% CI=1.37–3.60) and obesity (AOR=2.57; 95% CI=1.40–4.69) were associated with higher odds of hypertension after controlling for confounding. The rates of awareness, treatment and control of hypertension were 37.2% (95% CI=31.0–43.9), 20.9% (95% CI=16.0–26.9) and 22.2% (95% CI=12.2– 37.0), respectively.

Conclusion The high prevalence of hypertension in these rural communities is associated with contrastingly low awareness, treatment and control rates. Age, family history of hypertension and obesity are the major drivers of hypertension in this community. Veracious policies are needed to improve awareness, prevention, diagnosis, treatment and control of hypertension in these rural communities.

Strengths and limitations of this study

- Due to the non-probabilistic sampling method used, and the high proportion of elderly people in our study, this report may overestimate the prevalence of hypertension in these rural communities.
- Random error in and non-differential classification of hypertension in our study due to the use of a one-time blood pressure measure is likely to have reduced the power of our regression analyses.
- There is potential for residual confounding from measured and unmeasured confounders.
- Our study did not explore the determinants of controlled hypertension, including medication adherence.
- This study investigated the contribution of non-traditional factors such as wood smoke and consumption of fruits and vegetables to the prevalence of hypertension in these rural communities.

BACKGROUND

Hypertension is a major modifiable risk factor for cardiovascular diseases globally,[1 2] which is associated with increased costs on health systems, high morbidity and premature mortality. Globally, it is estimated that one billion adults live with hypertension; a figure which is projected to hit 1.5 billion by the year 2025.[2 3] Furthermore, hypertension-related complications are responsible for over 50% of the 17.4 million annual deaths caused by cardiovascular diseases globally.[2] At least 45% of deaths due to heart disease and 51% of deaths due to stroke are related to hypertension.[2]

Cardiovascular diseases are the second most common cause of premature disability and death in sub-Saharan Africa (SSA).[4–6] A large proportion of the burden of heart disease, kidney failure, strokes and premature deaths in this region are caused by hypertension.[7–10] The prevalence of hypertension in SSA is estimated at about 30% with disproportionately low awareness, treatment and control rates.[7] About 29.7% of the general Cameroonian population are affected by hypertension.[8] A significant number of cases of hypertension still remain undiagnosed and untreated, and even patients who receive treatment rarely achieve a controlled blood pressure.[9–12]

With the increasing prevalence of hypertension globally, including the rural areas, a continuous evaluation of the burden of hypertension in these rural communities is needed to plan prevention and control strategies. A limited number of community-based studies have assessed the epidemiology of hypertension in rural areas in Cameroon with significant disparities across regions. Cognizant to this, we sought to assess the prevalence and factors associated with hypertension among adults in selected health areas in a rural health district in the West Region of Cameroon. In addition, we evaluated the rates of awareness, treatment and control of hypertension in the same population.

METHODS

Study design, setting and duration

This was a community-based cross-sectional study conducted between August and October 2018 in the Baham Health District (BHD), as part of the University of Bamenda Medical Students Association (UBaMSA) annual community health campaign. The study was conducted in five of the nine health areas of the BHD, including the Hiala Cheffou, Bapa, Baham and Ngouogoua health areas. Baham is a rural community located in the West Region of Cameroon. The BHD had an estimated population of 51 500 in 2001[13] whose major activity is farming. It is made up of nine health areas with a district hospital.

Study population and sampling

The five health areas in which our study was conducted were selected based on ease of accessibility. Consenting participants aged 18 years and above were consecutively recruited for the study. Participants with documented or reported a diagnosis of chronic kidney disease, those who had taken cardiostimulants, such as alcohol, 'kola nut' (a caffeine-containing fruit of the Kola tree; a genus of trees that are native to the tropical rainforests of Africa) and caffeine at least 30 min prior to the study, and pregnant women were excluded from the study.

The sample size was estimated using the following formula:

$$n = \frac{Z^2P(1-P)}{d^2}$$

where n is the sample size (number of adult participants), P is the expected prevalence of hypertension in an adult population (P=0.378),[12] and d is the precision (if 5%, d=0.05). Z statistics (Z): for the level of confidence of 95%, which is conventional, Z value is 1.96 for a 95% CI. A minimum of 361 adult participants was required for this study.

Study procedure and data collection

One month prior to the UBaMSA health campaign, members of the community were informed by mass communication (through the local radio stations), and interpersonal communication on the dates retained for activities of the campaign. The data collection process was guided by the WHO step wise approach to surveillance. Data were collected by trained medical students and medical doctors. Information on the participants' demographics (such as age, sex and education), lifestyle (fruits and vegetable consumption, smoking status and physical activity) and medical history (family history of hypertension). In cases where participants did not understand English or French, a translator was used.

Blood pressure was measured using a reference protocol in which participants were seated, and measurements were taken after at least 10 min of rest. This was done using the auscultatory method with a calibrated analogue sphygmomanometer placed at least 0.5 cm above the elbow joint, covering at least 80% of the arm and a stethoscope was used to detect the korotkoff sounds. The analysis was done for the average of two measures performed at least 5 min apart.

Height was measured using a calibrated stadiometer to the nearest 0.1 cm. Weight was measured to the nearest 0.5 kg with the use of a scale, and the participants mounted the scale only wearing light clothing. Abdominal circumference was measured to the nearest 0.5 cm with a measuring tape placed all around the bare abdomen at the level of the umbilicus.

Definitions

1. Respondents were considered as hypertensive if they had an average SBP of 140 mm Hg or higher, or DBP of 90 mm Hg or greater, or reported current use of antihypertensive medication.[14]
2. Hypertension awareness rate was defined as the proportion of individuals who responded 'yes' to being diagnosed with hypertension by a healthcare professional and/or 'yes' to taking medication for hypertension.
3. The rate of hypertension treatment included the proportion of participants who were diagnosed with hypertension and reported being on treatment for hypertension.
4. Hypertension control was defined as the proportion of individuals on either pharmacotherapy or implementing lifestyle modification methods or both for hypertension and who had an average SBP <140 mm Hg and DBP <90 mm Hg.
5. Occupational level was classified into 'low' (no technical know-how or expert training required, eg, manual workers), 'medium' (requiring a degree of technical know-how but no expert training, like salesmen and bike and taxi drivers) and 'high' (major professionals requiring advanced training, such as teachers, health personnel and accountants).
6. We defined an ex-smoker as someone who has smoked at least 100 cigarettes in their lifetime but had stopped smoking at least 28 days before the interview. A smoker was defined as someone who has smoked at least 100 cigarettes in their lifetime and is still regular smokers at the time of the interview. Those who had

never smoked or smoked less 100 cigarettes in their lifetime were classified as non-smokers.
7. Alcohol units per week=(number of bottles of beer consumed per week)×5%×650 mL/1000.[15] The routine beer bottle in Cameroon has a volume of 650 mL, and the beer has an alcohol concentration of 5%.
8. The intensity of physical activity was classified as 'moderate' (eg, brisk walking, moderate farm work like weeding and harvesting, haunting, lifting masses<20 kg, housework and domestic chores and general building tasks, such as roofing and painting) and 'vigorous' (running, briskly ascending and descending hills, intense farm work such as manual tilling of the soil, digging ditches and carrying masses>20 kg).[16] Sedentary lifestyles at work and home were classified as 'no physical activity'.
9. The body mass index (BMI) was calculated as the ratio of the weight in kilograms and the square of the height in metres. BMI-based body habitus (in kg/m^2) was classified as underweight (BMI <18.5), normal weight (BMI=18.5–24.9), overweight (BMI=25.0–29.9) and obese (BMI ≥30).[17]
10. Abdominal obesity was defined as an abdominal circumference ≥102 cm in men or ≥88 cm in women.[18]

Data analysis

Data were analysed with Stata V.16 (StataCorp 2019, StataCorp LLC, College Station, Texas, USA). Qualitative variables were reported using counts and percentages. Quantitative variables were summarised as means and medians with their corresponding SD and IQR, respectively. We computed direct age-standardised prevalence of hypertension using the 2011 population structure of Cameroon.[19] For univariate analyses, the Pearson χ^2 test was used to compare categorical variables while the Wilcoxon rank-sum test was used to compare medians across independent groups. The Pearson correlation test was used to assess the association between two normally distributed quantitative variables. Independent factors associated with hypertension were determined using unconditional maximum likelihood multivariable logistic regression models. Variables with a p value <0.1 on univariate analysis qualified for inclusion in the multivariable model. We sequentially adjusted for demographic factors (such as age, gender, occupation and education), lifestyle factors (smoking status, alcohol consumption, fruit consumption and physical activity) and clinical characteristics (family history of hypertension and BMI). The maximum likelihood ratio test was used to evaluate model fit and select variables for the final multivariable model. Gender, alcohol consumption and smoking status were retained in the final model as they have been reported as factors associated with hypertension in the literature. Body mass index was retained in the final model over abdominal obesity to facilitate comparison of our findings with previously published studies and to prevent multicollinearity. Ordinal variables were assessed for linear trend using the χ^2 test for linear trend. The χ^2 test for heterogeneity was used to evaluate departures from linearity. Measures of association are reported as OR with corresponding 95% CI. Missing data were handled using simple mean, median or mode imputation where appropriate. Two-tailed p values <0.05 were considered statistically significant.

Patient and public involvement

Patients and/or the public were not directly involved in this study.

RESULTS

In total, 526 participants with a median age of 53.0 (IQR=35–65) years were included in this study. The ages of the participants ranged from 18 to 99 years. About 67% of the participants were females and 76.6% were married, table 1. A little over half of the participants were Catholic Christians and about three-quarters of them had at least a primary education. The average BMI was 27.2 (SD=5.2), and about 44% of the participants had android obesity.

Prevalence of hypertension

Of the 526 participants, 215 were classified as hypertensive, giving an overall crude prevalence of 40.9% (95% CI=36.7–45.1). Figure 1 shows the gender-specific prevalence of hypertension (with their 95% CI) across different age groups. There was a linear increase in the prevalence of hypertension among older participants, with no gender disparity. The overall age-standardised prevalence of hypertension was 23.9% (95% CI=20.3–27.5).

Factors associated with hypertension

On univariate analysis, participants with hypertension were significantly older (median age in years=64.0 years vs 42.0 years) and consumed fruits less regularly (median daily fruit consumption per week=2.0 vs 4.0) compared with those without hypertension, table 2. There was strong evidence against the null hypothesis of no difference in marital status, occupation, level of education, family history of hypertension and intensity of physical activity between participants with and without hypertension. There was weak evidence against the null hypothesis of no difference in exposure to wood smoke between participants with and without hypertension. There was a moderate positive correlation between BMI and abdominal circumference (r=0.60, p<0.001).

Figure 2 displays the final multivariable logistic regression model (without abdominal obesity). There was strong evidence of a 34% increase in the odds of hypertension for every 5-year increase in age (adjusted OR (AOR)=1.34; 95% CI=1.23–1.44; p<0.001). Family history of hypertension was associated with 2.22 times higher odds of hypertension (AOR=2.22; 95% CI=1.37–3.60; p<0.001). Obesity was associated with 2.57 times higher odds of hypertension (AOR=2.57; 95% CI=1.40–4.69; p_{trend} <0.001).

Table 1 Characteristics of the study population, Baham Health District, 2018

Participants' characteristics	Female (n=353)	Male (n=173)	Total (n=526)
Age (in years)*	54.0 (36.0–65.0)	50.0 (33.0–66.0)	53.0 (35.0–65.0)
Age groups (in years)			
18–39	98 (27.8%)	59 (34.1%)	157 (29.8%)
40–59	120 (34.0%)	50 (28.9%)	170 (32.3%)
60 and over	135 (38.2%)	64 (37.0%)	199 (37.8%)
Marital status (Married)	282 (79.9%)	121 (69.9%)	403 (76.6%)
Occupation			
High	11 (3.1%)	11 (6.4%)	22 (4.2%)
Medium	40 (11.3%)	73 (42.2%)	113 (21.5%)
Low	302 (85.6%)	89 (51.4%)	391 (74.3%)
Religion			
Baptist	9 (2.5%)	4 (2.3%)	13 (2.5%)
Catholic	190 (53.8%)	85 (49.1%)	275 (52.3%)
Muslim	4 (1.1%)	10 (5.8%)	14 (2.7%)
Others	76 (21.5%)	43 (24.9%)	119 (22.6%)
Pegan	5 (1.4%)	14 (8.1%)	19 (3.6%)
Presbyterian	69 (19.5%)	17 (9.8%)	86 (16.3%)
Level of education			
No formal education	100 (28.3%)	31 (17.9%)	131 (24.9%)
Primary	114 (32.3%)	41 (23.7%)	155 (29.5%)
Secondary	109 (30.9%)	74 (42.8%)	183 (34.8%)
Tertiary	30 (8.5%)	27 (15.6%)	57 (10.8%)
Family history of hypertension (Yes)	110 (31.2%)	31 (17.9%)	141 (26.8%)
Smoking status			
Non-smoker	334 (94.6%)	101 (58.4%)	435 (82.7%)
Ex-smoker	12 (3.4%)	37 (21.4%)	49 (9.3%)
Current smoker	7 (2.0%)	35 (20.2%)	42 (8.0%)
Alcohol units per week			
Non-drinker	122 (34.6%)	41 (23.7%)	163 (31.0%)
(0.012–6.49]	164 (46.5%)	41 (23.7%)	205 (39.0%)
(6.492–117]	67 (19.0%)	91 (52.6%)	158 (30.0%)
Body mass index (in kg/m^2)†	28.1 (5.4)	25.5 (4.4)	27.2 (5.2)
Body mass index categories			
Normal	100 (28.3%)	89 (51.4%)	189 (35.9%)
Overweight	157 (44.5%)	63 (36.4%)	220 (41.8%)
Obese	96 (27.2%)	21 (12.1%)	117 (22.2%)
Abdominal obesity (Yes)	215 (60.9%)	18 (10.4%)	233 (44.3%)
Systolic blood pressure (in mm Hg)†	134.5 (25.9)	133.2 (21.3)	134.1 (24.5)
Diastolic blood pressure (in mm Hg)†	83.0 (14.8)	83.1 (14.0)	83.0 (14.5)

*Summarised as median and IQR.
†Data summarised as mean (SD).
n, frequency

Awareness, treatment and control of hypertension

Table 3 depicts the percentage of hypertension awareness, treatment and control among our study participants. Of the 215 participants diagnosed with hypertension, 37.2% (95% CI=31.0–43.9) were aware of their hypertensive status, while 20.9% (95% CI=16.0–26.9) reported being on treatment for hypertension. Of the 45 participants who were on treatment for hypertension, 22.2% (95% CI=12.2–37.0) had a controlled BP.

DISCUSSION

We report a prevalence of hypertension of 40.9% (age-standardised prevalence=23.9%) with associated low awareness, treatment and control rates in the BHD. Older age, family history of hypertension and obesity were drivers of hypertension in this population.

Prevalence of hypertension and associated factors

The crude prevalence of hypertension in our study was higher than the crude prevalence of 33.9% and 31.1% in rural areas of the Far North Region[12] and South West Region of Cameroon,[20] respectively. This higher prevalence of hypertension in our study can be attributed to the older age of our study population compared with those of previous studies. Indeed, the median age of our study participants was 53 years compared with a mean age of 39 years reported by Lemogoum *et al*.[12] In addition, over 65% of the participants in the study by Arrey *et al* were between 20 and 29 years old.[20] Older age is a strong determinant of hypertension. We noted a strong positive linear trend between older age and hypertension as has been observed in other studies in Cameroon[8 12 20 21] and elsewhere.[22] Age-standardisation with Cameroon's population of 2011 permitted comparison of our results with those of Lemogoum *et al*.[12] The age-standardised prevalence of hypertension in our study was half of the crude prevalence, indicating the contribution of age in the overall crude prevalence in this study. The age-standardised prevalence in our study was lower than that reported by Lemogoum *et al*.[12]

Differences in ethnicity, socioeconomic and lifestyle factors could account for the variation in the prevalence of hypertension in our study compared with previous studies.[8 12 20 21] Our study recruited participants from the Bamileke ethnic group. In a recent publication by Kuate Defo *et al*, participants recruited from this ethnic group had the highest prevalence of hypertension in Cameroon.[23] Our study suggests that genetic predisposition to hypertension is a significant determinant of hypertension in our study population as history of hypertension was associated with over two-times increase in the odds of hypertension. Differences in BMI can explain, in part, the variation in the prevalence of hypertension in this study compared with other studies reporting on the prevalence of hypertension in rural Cameroon.[12 20 21] Over 60% of our study participants had a BMI over the normal range, and there was a strong positive linear relationship between hypertension and BMI. Adiposity is a strong risk factor for hypertension and an important driver of the prevalence of hypertension.[24]

In Cameroon, there has been a roll up in the prevalence of hypertension in the general population from 16.4% in 1998[25] to 29.7% in 2015,[8] with recent projections estimating an increase of 40% by 2025 and 95% by 2035.[26] The prevalence of hypertension in this study approximates prevalence of 47.5% and 41% reported in four urban areas in Cameroon in 2012,[11] and a rural community in South Africa,[27] respectively. Such high prevalence of hypertension, especially among the elderly, in these rural communities, warrants the need for further investigations to ascertain the burden of the disease and plan effective prevention and management strategies.

We found no independent association between hypertension and sex, education, marital status and physical activity, as has been reported in previous studies.[12 20]

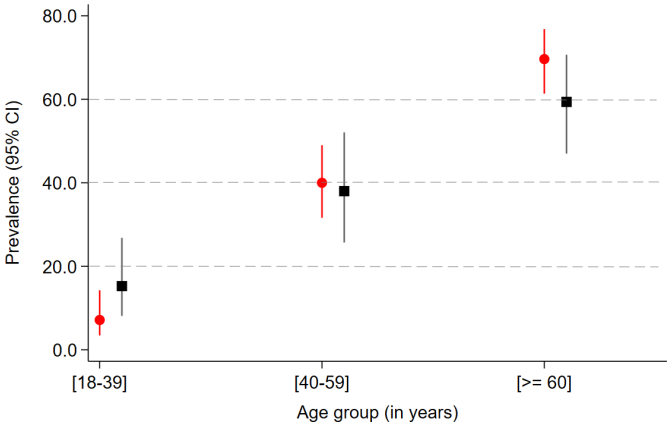

Figure 1 Prevalence (%) (and 95% CI) of hypertension stratified by age and gender. The red circle and black square represent the point estimate of the prevalence of females and males, respectively. The spikes represent the limits of the 95% CI.

Awareness, treatment and control of hypertension

We report a low awareness rate and even lower treatment and control rates among patients with hypertension in these communities. This is in line with findings reported in rural areas of the Far North and South West regions of Cameroon,[12 20] and a meta-analysis by Ataklte *et al*.[28] In the Mafia Island of Tanzania, a low control rate of 20.5% was recorded despite the very high treatment rate.[29] This is in contrast to the relatively higher control rates (44.7%) reported in a rural community in Ghana.[30]

The low awareness, treatment and control rates reported in this study could be explained by inadequate patient information of the disease, its risk factors, and consequences in the long run. Low awareness is a major barrier to effective management which can lead to the development of hypertension-related complications. A paucity of healthcare professionals at the primary

Table 2 Factors associated with hypertension in the Baham Health District on univariate analysis

Participants' characteristics	No hypertension (n=311)	Hypertension (n=215)	Total (n=526)	P value
Age group (in years)	42.0 (28.0–58.0)	64.0 (53.0–73.0)	53.0 (35.0–65.0)	<0.001*
Gender				0.370†
Female	204 (65.6%)	149 (69.3%)	353 (67.1%)	
Male	107 (34.4%)	66 (30.7%)	173 (32.9%)	
Marital status				<0.001†
Married	212 (68.2%)	191 (88.8%)	403 (76.6%)	
Single	99 (31.8%)	24 (11.2%)	123 (23.4%)	
Occupation				0.017‡
Low/unemployed	218 (70.1%)	173 (80.5%)	391 (74.3%)	
Medium	80 (25.7%)	33 (15.3%)	113 (21.5%)	
High	13 (4.2%)	9 (4.2%)	22 (4.2%)	
Religion				0.180†
Baptist	11 (3.5%)	2 (0.9%)	13 (2.5%)	
Catholic	154 (49.5%)	121 (56.3%)	275 (52.3%)	
Muslim	11 (3.5%)	3 (1.4%)	14 (2.7%)	
Others	74 (23.8%)	45 (20.9%)	119 (22.6%)	
None	12 (3.9%)	7 (3.3%)	19 (3.6%)	
Presbyterian	49 (15.8%)	37 (17.2%)	86 (16.3%)	
Level of education				<0.001‡
None	55 (17.7%)	76 (35.3%)	131 (24.9%)	
Primary	81 (26.0%)	74 (34.4%)	155 (29.5%)	
Secondary	130 (41.8%)	53 (24.7%)	183 (34.8%)	
Tertiary	45 (14.5%)	12 (5.6%)	57 (10.8%)	
Family history of hypertension				0.002†
No	243 (78.1%)	142 (66.0%)	385 (73.2%)	
Yes	68 (21.9%)	73 (34.0%)	141 (26.8%)	
Smoking status				0.760‡
Non-smoker	256 (82.3%)	179 (83.3%)	435 (82.7%)	
Ex-smoker	28 (9.0%)	21 (9.8%)	49 (9.3%)	
Current smoker	27 (8.7%)	15 (7.0%)	42 (8.0%)	
Exposure to wood smoke				0.048‡
≥4 days/week	200 (64.3%)	160 (74.4%)	360 (68.4%)	
<4 days/week	75 (24.1%)	36 (16.7%)	111 (21.1%)	
Never	36 (11.6%)	19 (8.8%)	55 (10.5%)	
Alcohol units per week				0.510‡
Non-drinker	92 (29.6%)	71 (33.0%)	163 (31.0%)	
(0.012–6.49]	120 (38.6%)	85 (39.5%)	205 (39.0%)	
(6.49 to 117]	99 (31.8%)	59 (27.4%)	158 (30.0%)	
Daily consumption of vegetable per week	1.0 (1.0–2.0)	1.0 (1.0–2.0)	1.0 (1.0–2.0)	0.230*
Daily consumption of fruit per week	4.0 (2.0–6.0)	2.0 (2.0–4.0)	2.0 (2.0–6.0)	<0.001*
Intensity of daily physical activity				<0.001‡
Low	134 (43.1%)	134 (62.3%)	268 (51.0%)	
Moderate	123 (39.5%)	72 (33.5%)	195 (37.1%)	
Vigorous	54 (17.4%)	9 (4.2%)	63 (12.0%)	

Continued

Table 2 Continued

Participants' characteristics	No hypertension (n=311)	Hypertension (n=215)	Total (n=526)	P value
Body mass index categories				0.053‡
Normal	119 (38.3%)	70 (32.6%)	189 (35.9%)	
Overweight	134 (43.1%)	86 (40.0%)	220 (41.8%)	
Obese	58 (18.6%)	59 (27.4%)	117 (22.2%)	
Abdominal obesity				<0.001†
Yes	115 (37.0%)	118 (54.9%)	233 (44.3%)	
No	196 (63.0%)	97 (45.1%)	293 (55.7%)	

*P value from Wilcoxon rank sum test,
†P value from χ^2 test for heterogeneity.
‡P value from χ^2 test for trend

healthcare level and the absence of a hypertension clinic at the district hospital in our study setting limits awareness, treatment and control of hypertension in this population. Implementing policies to improve population education on hypertension and the importance of regular follow-up by a trained nurse or physician to prevent long-term complications would vastly improve awareness, treatment and control of hypertension in this setting.[31] Other cost-effectiveness measures, including the use of home BP monitoring, could go a long way

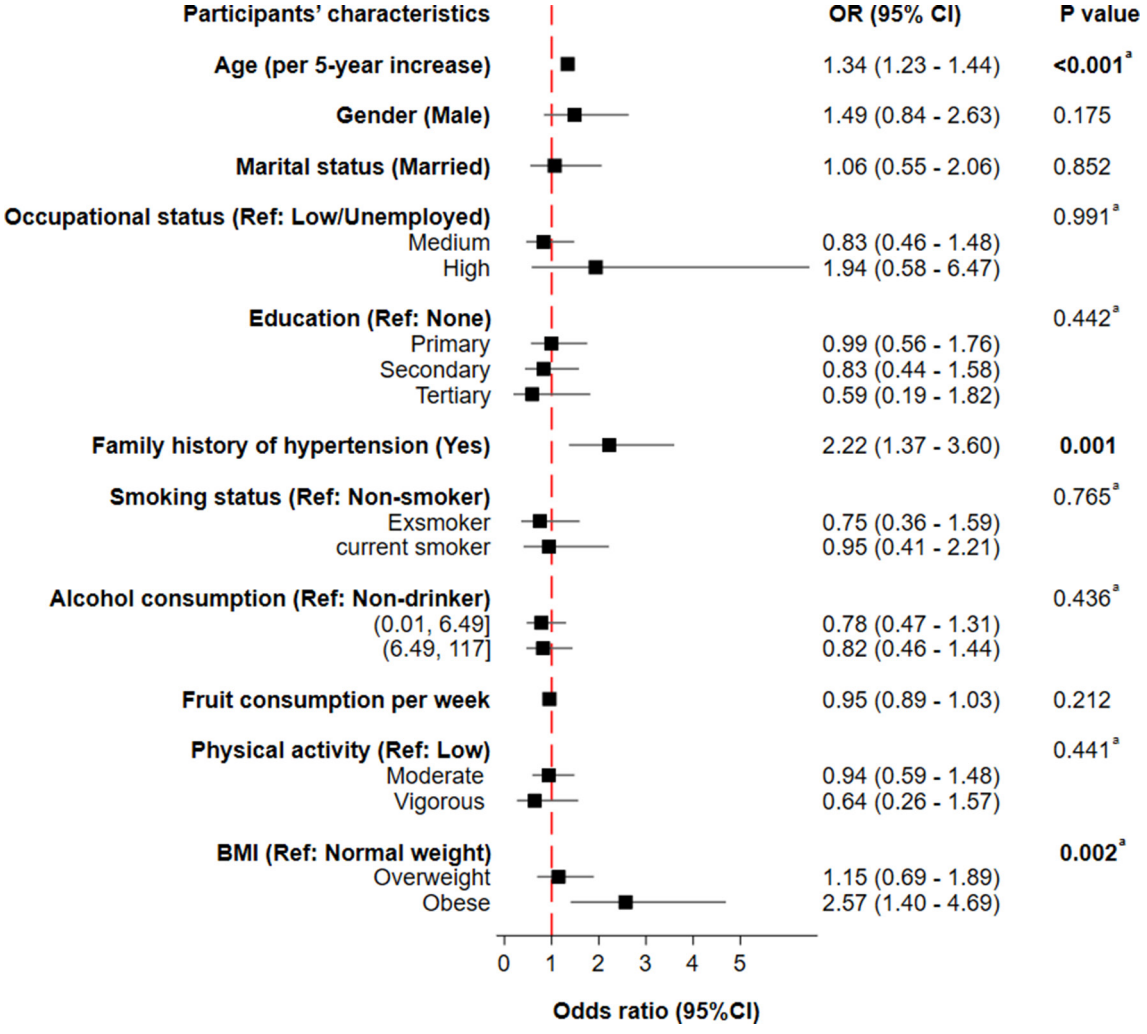

Figure 2 Factors associated with hypertension in the Baham Health District multivariable logistic regression analysis. Measures of associations are displayed as OR, black squares, with the 95% CI, horizontal spikes. Significant p values are shown in bold. The red dashed line refers to the null value of 1.0. [a]P value for trend.

Table 3 Awareness, treatment and control of hypertension, Baham Health District, 2018

Outcomes	Frequency	Percentage (95% CI)
Hypertension awareness (n=215)	80	37.2 (31.0–43.9)
Hypertension treatment (n=215)	45	20.9 (16.0–26.9)
Treated and controlled (n=45)	10	22.2 (12.2–37.0)

n, frequency.

to improve adherence and control of hypertension in Cameroon.[32]

CONCLUSION

About two in five participants in our study population had hypertension. The high prevalence of hypertension in this study was contrasted by low awareness, treatment and control rates. In a bit to curb the burden of hypertension in Cameroon, national policies need to adopt measures to address obesity and its risk factors. Measures to improve awareness of hypertension like regular community education, diagnosis, treatments and control could go a long way to reduce the burden of hypertension in this rural community.

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Acknowledgements The authors are grateful for the invaluable contributions of all those who participated in the University of Bamenda Medical Student (UBaMSA) health campaign during the September 2018 edition. Also, we thank Ms Grace Heaton, a DPhil candidate in History at the University of Oxford, for proofreading our manuscript. Dr Agbor and Dr Noubiap are grateful to the University of Oxford and the University of Adelaide, respectively, for supporting them with postgraduate scholarships.

Contributors LPS, VNA and JJNN involved in study design and conception. LPS, OPN, PS-MN, AFAA, JNM, NFB and HGGT involved in data collection. VNA and LPS involved in data analysis and interpretation. LPS and VNA involved in manuscript drafting. LPS, OPN, PS-MN, AFAA, JJNN, JNM, NFB and HGGT involved in revision of the manuscript. VNA, JJNN and DM involved in critical revision of the manuscript. All authors read and approved the final manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Ethics approval Ethical approval was obtained from the Faculty of Health Sciences Institutional Review Board, the University of Bamenda (Project ID: 2018/0045 hour/UBa/IRB) and all participants provided written informed consent prior to recruitment to the study.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. All data presented in the manuscript results are in possession of the corresponding author and will be made available on reasonable demand.

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