Prevalence and Associated Risk Factors of Hypertension among Adults (40 Years and Above) in the Tano North District of the Ahafo Region, Ghana

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

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ABSTRACT

Introduction: Increased prevalence of hypertension (HTN) has been attributed to commonly known risk factors such as obesity, low level of nutritional knowledge, lack of exercise, alcohol intake, and tobacco use.
Objective: The objective of this study is to determine the prevalence, and associated risk factors of hypertension among residents of the Yamfo community in the Ahafo Region of Ghana.
Methods: A community-based cross-sectional study of 174 participants aged ≥40 years were enrolled using simple random sampling. A structured questionnaire was used to elicit information on sociodemographic characteristics, behavioural/lifestyle risk factors and knowledge of hypertension. Data was analysed using SPSS version 23.

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Results: Prevalence of hypertension was 63.2% (95% CI: 55.7–70.1) in adults 40 years and above. Risk factors that were significantly associated with hypertension were lack of physical activity (p=0.030), alcohol consumption (p=0.001), consumption of meals prepared with oil (p=0.016), reduced frequency of fruit consumption (p=0.008) and reduced frequency of vegetable consumption (p<0.001). Increasing age (aOR,1.9; 95%CI (1.3-2.4); p=.049), physical activity (cOR,2.12, 95% CI (1.07-4.21), p=.032), alcohol consumption (aOR, 57.03; 95% C1 (4.48-726.59); p=.002), and knowledge on the cause of hypeternsion (aOR, 3.41; 95% CI (1.93-5.17); p=.032) were observed as determinants of hypertension.

Conclusion: Majority of the study participants were hypertensive, with the majority of them having knowledge on risk factors of hypertension. Majority of participants had the opinion that hypertension is inevitable, because it comes with old age. Enough (Intensive) education concerning hypertension could be extended to the community, about the different, but equally relevant risk factors of hypertension, such as smoking, alcohol consumption, reduced fruit and vegetable consumption and inappropriate diet. This could be achieved by organizing outreach programs by the community health workers in places like markets and churches in order to remit the elderly that they can still be healthy in old age, and at schools and on social media to inculcate positive health behavior in the youth.

1. INTRODUCTION

Hypertension (HTN) is a major public health concern worldwide, according to the World Health Organization (WHO) [1]. The term "hypertension" refers to high blood pressure in the arteries. The greatest (highest) pressure imposed by blood on the artery walls by the heart during a contraction (systolic pressure) should usually be less than 140 mmHg, and the lowest pressure on the arterial wall, during the resting phase of the heart in between contractions, should usually be less than 90 mmHg (diastolic pressure) [2,3]. The American Heart Association defines hypertension as a persistent rise in blood pressure exceeding 140/90 mmHg or a systolic blood pressure above 140 mmHg or a diastolic pressure above 90 mmHg [4]. Blood pressure is shown to be higher in men than in women of similar ages [5].

Hypertension, also termed high blood pressure, is a global public health problem associated with health implications worldwide [6]. Hypertension affects one billion people worldwide, according to estimates [7]. This figure is expected to increase to 1.56 billion by 2025 [8]. Hypertension has been rated as one of the top ten causes of death in the world today [9]. It is currently estimated to affect about a billion people globally and causes about nine million deaths every year [6].

It is a well-known adult illness that predisposes individuals to a variety of cardiovascular problems [10]. The Ghana Health Service revealed that almost 50% of Ghanaian adults are hypertensive, with 70% not knowing their status; thus the name 'silent killer' as many may have it for years without realizing it, which slowly damages the brain, heart, kidneys and eyes [11]. Furthermore, hypertension and its related complications are the main cause of stroke and deaths at the Komfo Anokye Teaching Hospital in the Ashanti region [12]. The prevalence of hypertension among the Ghanaian population is 13% [13]. An estimated 28.1 percent of Ghanaians in the middle belt of Ghana are hypertensive [14]. In Ghana, the majority of individuals use medications for diabetes, hypertension, or other chronic diseases [15]. Though there is scarce literature on the incidence of cardiovascular diseases and its associated risk factors in Bono Region, there is evidence that cardiovascular disease-related mortality is high in the Brong Ahafo Region [16]. Old age, level of education, physical inactivity, smoking, excessive consumption of alcohol, obesity, duration of diabetes status and family history of diabetes and hypertension have been documented as risk factors for hypertension among diabetics in some places [17–21].

Hypertension in Ghana is a serious problem. It is often associated with most morbidity and mortality in Ghana [13] thereby reducing productivity of the country [22,23]".

Although studies have found a link between work-related stress and hypertension, and as well as other cardiovascular disease risk factors [24,25], there is scarcity of data on the prevalence of hypertension and its risk factors among Ghanaian elderly population living in a

semi-urban setting. This study aims to contribute to the attainment of the third sustainable development goal (SDG) of Good Health and Well-Being through the recommendation that may arise from this study. The findings of this study are also expected to inform the non-governmental organizations working in the area of Non-Communicable Diseases (NCDs) to help minimize hypertension among residents of the Yamfo community, Ghana and the world at large.

2. METHODS AND MATERIALS

2.1 Study Area

The study was conducted in Yamfo, a community in the Tano North District of the Ahafo Region of Ghana. Duayaw-Nkwanta was created as administrative capital of the district of Tano in 2004. Tano North has a population of 79,973, making about 3.5% of the total population of the region. Males make up 49.5% and females make up 50.5%. In urban and rural areas there are nearly equal numbers of the population. The district's population is young (39.9 percent) representing a large population pyramid with limited numbers of elders (4.9 percent) [26].

2.2 Study Design

This study adopted a community based cross-sectional study that was carried out in the Yamfo community from March to June 2021.

2.3 Study Population

All adults of diverse ethnicity, occupations, and aged 40 years and above, who resided within the Yamfo community were eligible to participate in the study.

2.4 Inclusion and Exclusion Criteria

Individuals who were eligible to take part in this study included persons who were residents of Yamfo, and also 40 years of age, and above. All other persons outside these criteria were excluded from this study.

2.5 Sample size Determination, Sampling Techniques and Procedure

The sample size for the study was determined by using the formula by the Snedecor & Cochran,

[27]; **n= z²p(1-p)/d²** Where, n= sample size, z= z-score that corresponds with 95% confidence interval=1.96, p = estimated proportion of Hypertension = 13% = 0.13, Prevalence of hypertension among Ghanaians was determined to be 13% [13]. d= margin of error = 5% = 0.05.

$$n= \frac{(1.96)91.96)(0.13)(1-0.13)}{(0.05)2} = 173.79 \ldots\ldots\ldots\ldots (1)$$

n= 174

One-hundred and seventy-four (174) participants were recruited for the study. Simple random sampling technique was used to recruit participants who were eligible into the study. Leaders of the various houses were made to pick pieces of papers with the inscriptions **YES** or **NO**. All those who picked the paper with the **YES** inscription were recruited into the study. This procedure was repeated until the sample size was obtained for the study.

2.6 Data Collection tools and Procedures

A comprehensive, and well-structured questionnaire was designed based on the set objectives by the researcher in English. The instrument was categorized into FOUR (4) main parts, sections A, B, C and D. Section A included specific questions on respondent's socio-demographic characteristics, B was about lifestyle and behavioural characteristics of participants. Section C dealt with family history of participants whilst section D elicited information on participants' level of knowledge on hypertension and its risk factors. The researchers used structured questionnaires to elicit information from eligible respondents during the data collection. The researchers introduced themselves to the respondents and briefly explained the aim of the study to them. Participants were encouraged to respond appropriately to the questions. The questionnaire was pre-tested in the same community to check for its validity in the local context before the actual data collection was done.

2.7 Data Analysis

Primary data from the field was coded, sorted, cleaned, managed and entered into Microsoft excel version 16. Data was subsequently exported into SPSS version 23 and analysed. The data was analysed based on the objectives of the study. Socio-demographic characteristics

such as age, sex, religion, and educational level were analysed and presented in frequencies and percentages using tables. Chi-square analysis was then used to establish associations between the dependent and independent variables.

Multiple logistic regression analysis was performed on all variables that were statistically significant at 95% CI and a p-value < 0.2 at the bivariate level. Related factors that are associated with hypertension were determined using the binary and multiple logistic regression analysis to determine both the crude and adjusted odds ratios, their respective 95%CI and p-values. The p-value <0.05 were considered statistically significant in this study.

3. RESULTS

3.1 Sociodemographic Characteristics of Participants

Table 1 below shows the background characteristics of the participants. The mean ± SD, minimum, and maximum ages of 60.4 ± 14.1, 40 and 95 years respectively. Most 49 (28.1%) of the respondents were within the age group of 40-49 years. Majority 97 (55.8%) were females. A little over half 88 (50.6%) were single or widowed. The majority of the participants (50.6%) were Christians. With regards to education, most of them 50 (28.7%) did not have any form of formal education and the majority 67 (38.5%) were pensioners.

Table 1. Sociodemographic characteristics of participants (n=174)

Variables	Frequency (n=174)	Percentage (%)
Age: Mean ± SD	60.4 ± 14.1	
40-49	49	28.1
50-59	45	25.9
60-69	35	20.1
70-79	25	14.4
80-89	14	8.0
90 and above	6	3.5
Sex		
Female	97	55.8
Male	77	44.2
Marital status		
Single/widowed	88	50.6
Married	72	41.4
Divorced	14	8.0
Religion		
Christianity	88	50.6
Islam	83	47.7
Traditional religion	3	1.7
Education		
None	50	28.7
Primary	41	23.6
Secondary	36	20.7
Tertiary	47	27.0
Occupation		
Farmer	45	25.9
Self employed	47	27.0
Government worker	15	8.6
Pensioner	67	38.5

3.2 Behavioural / Lifestyle Characteristics of Participants

With respect to the lifestyle characteristic of respondents, the majority (73.6% and 68.0%) were reported to have been physically active and exercised between 1-3 days per week respectively. The majority (67.8%) of the respondents never consumed alcohol and 69.5% does not smoke. Out of the 53 (30.5%) who ever smoked, only 5 (9.4%) still smoked as at the time of interview. Most of the respondents 143 (82.2%) added salt to their food at table. Out of these 143, the majority 133 (93.0%) added the added salt to their food at table between 1-3 times weekly. Most 168 (96.6%) of the respondents consumed meals prepared with fat/oil with majority 101 (60.1%) consuming fat/oil between 1-3 times every week. A total of 170 out of 174 (97.7%) said they consumed fruits, with 135 (79.4%) consuming fruits on weekly basis. Almost all 172 (98.9%) respondents reported having consumed vegetables with most 64 (37.2%) of them consuming it 4-6 time weekly (Table 2).

Table 2. Behavioural / lifestyle characteristics of participants (N=174)

Variables	Frequency (n)	Percentage (%)
Physical activity		
No	46	26.4
Yes	128	73.6
If yes, number of days active		
1 - 3 days	87	68.0
4 or more days	41	32.0
Ever consumed alcohol?		
No	56	32.2
Yes	118	67.8
Do you currently consume alcohol? (n=118)		
No	94	79.7
Yes	24	20.3
Ever smoked a cigarette?		
No	121	69.5
Yes	53	30.5
Do you currently smoke? (n=53)		
No	48	90.6
Yes	5	9.4
Add salt to your food at the table		
No	31	17.8
Yes	143	82.2
How often do you add salt to food in a week? (n=143)		
1-3 times	133	93.0
4-6 times	10	7.0
Do you consume food prepared with oil/fat?		
No	6	3.4
Yes	168	96.6
How often do you consume food prepared with oil/fat in a week? (n=168)		
1 - 3 times	101	60.1
4 - 6 times	62	36.9
Everyday	5	3.0
Do you consume fruits?		
No	4	2.3
Yes	170	97.7
How often you consume fruit in a week? (n=170)		
1 - 3 times	135	79.4
4 - 6 times	33	19.4
Everyday	2	1.2

Variables	Frequency (n)	Percentage (%)
Do you consume vegetables?		
No	2	1.1
Yes	172	98.9
How often you consume vegetables in a week? (n=172)		
1 - 3 times	63	36.6
4 - 6 times	64	37.2
Everyday	45	26.2

3.3 Family History of Respondents Regarding Hypertension

Out of the 174 respondents, 117 (67.2%) had positive family history of hypertension. Of the 174 respondents, 110 (63.2%) were hypertensive. Of the 110 who were hypertensive, 65 (59.0%) of them have been living with it for between 1-5 years as at the time of data collection (Table 3).

3.4 Knowledge on Causes of Hypertension among Respondents

As shown in Fig. 1, among the 174 respondents, the proportion of respondents who knew the causes of hypertension was 96.6% (95% CI= 92.5 – 98.5).
Out of the 174 respondents that were recruited into the study, 36 (21.4%) of them attributed hypertension to old age, 34 (20.2%) mentioned excessive salt intake while 5 (3.0%) percent said hypertension is caused by physical inactivity (Fig. 2).

3.5 Association of Socio-Demographic Factors with Hypertension

Association between hypertension and education was statistically significant (x^2 = 7.79, p-value =0.047). All the other sociodemographic characteristics of the respondents were not statistically associated with hypertension at the significance level of $p<0.05$ (Table 4).

3.6 Association of Behavioural / Lifestyle Characteristics with Hypertension

Out of the 174 respondents, 128 of them were physically active. Of these, 41 (32.0%) were not hypertensive while 87 (68.0%) of them were hypertensive. This association between hypertension and physical activity is statistically significant (x^2 = 4.7, p-value =0.030). Current alcohol consumption had significant association with hypertension (x^2 = 11.90, p-value<0.001). Oil/fat in diet was also significantly association with hypertension (x^2 = 5.79, p-value =0.016). Among the 174 respondents, only 5 (2.9%) of them consumed meals prepared with fat/oil every day. Majority of the respondents 101 (58.0%) consumed meals prepared with fat/oil between 1-3 times daily and from this number, 59 (58.4%) had hypertension. Frequency of fat/oil intake was statistically associated with hypertension (x^2 = 7.49, p-value =0.024). Consumption of fruits was statistically associated with hypertension (x^2 = 7.04, p-value =0.008). Out of the 170 respondents who consumed fruits, only 2 (1.2%)

Table 3. prevalence of Hypertension among Respondents (N=174)

Variables	Frequency (n)	Percentage (%)
Has any member of your family been diagnosed with hypertension before?		
No	57	32.8
Yes	117	67.2
Have been diagnosed with HTN		
No	64	36.8
Yes	110	63.2
How long have you been living with hypertension? (N=110)		
Less than 1 year	19	17.3
1-5 years	65	59.0
6-10 years	17	15.5
11 years or more	9	8.2
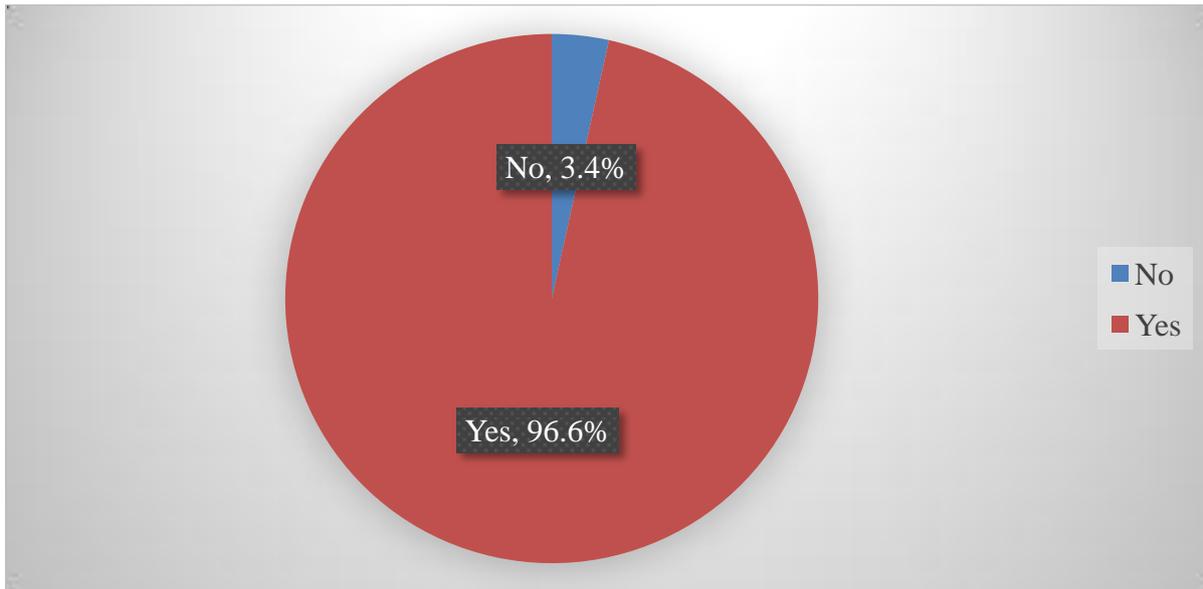
Fig. 1. Knowledge of hypertension among respondents

of them ate the fruits every day. Most of the respondents 137 (79.4%) consumed the fruits between 1-3 times weekly, with 98 (72.6%) being hypertensive. This was statistically associated with hypertension (x^2 = 18.09, p-value<0.001). Out of the 172 respondents who consumed vegetables, majority of them 64 (37.2%) consumed the vegetables between 4-6 times weekly. Of the 64 respondents who consumed vegetables between 4-6 times weekly, 40 (62.5%) had hypertension. This was statistically associated with hypertension (x^2 = 29.00, p-value<0.001) (Table 5).

3.7 Association of Respondents Knowledge with Hypertension

Out of the 174 respondents, 168 (96.6%) of them reported that they knew the causes/risk factors of hypertension. Out of these 168 respondents, the majority 104 (61.9%) had hypertension. This association was not statistically significant (x^2 = 3.62, p-value =0.057). With regards to the knowledge on the causes/risk factors of hypertension, the majority of the respondents 36 (21.2%) said old age was a cause/ risk factor. This association between hypertension and the knowledge of the causes/risk factors of hypertension was statistically significant (x^2 = 0.46, p-value =0.004) (Table 6).

3.8 Binary and Multiple Logistic Regression Analysis for Factors Associated with Hypertension

With all other variables controlled for, there was 1.9 times increased odds of hypertension among respondents who are >60 years compare to those ≤ 60 years (aOR 1.9; 95%CI=1.3-2.4), there was 57 times increased odds of hypertension among those who currently consumed alcohol compared to those who did not (aOR = 57.0, 95% CI = 4.5 − 726.6). The odds of hypertension among respondents who consumed food prepared fat/oil 4-6 times weekly was increased by 23.3 folds compared to those who consumed food prepared fat/oil only 1-3 times per week (aOR = 23.3, 95%CI = 1.5 − 359.5). Those who consumed fruits 4-6 times weekly were not likely to be diagnosed of hypertension compared to those who consumed fruits only 1-3 times per week (aOR = 0.0, 95% CI = 0.0 − 0.1). Similarly, those who consumed vegetables daily did not have any chance of being diagnosed with hypertension compared to those who consumed the vegetables only 1-3 times weekly (aOR = 0.0, 95%CI= 0.0 − 0.04). Respondents who did not know about the causes of hypertension were 3.41 times more likely to be diagnosed with hypertension compared to their counterparts who knew the causes of hypertension (aOR=3.41, 95%CI=1.93-5.17) (Table 7).
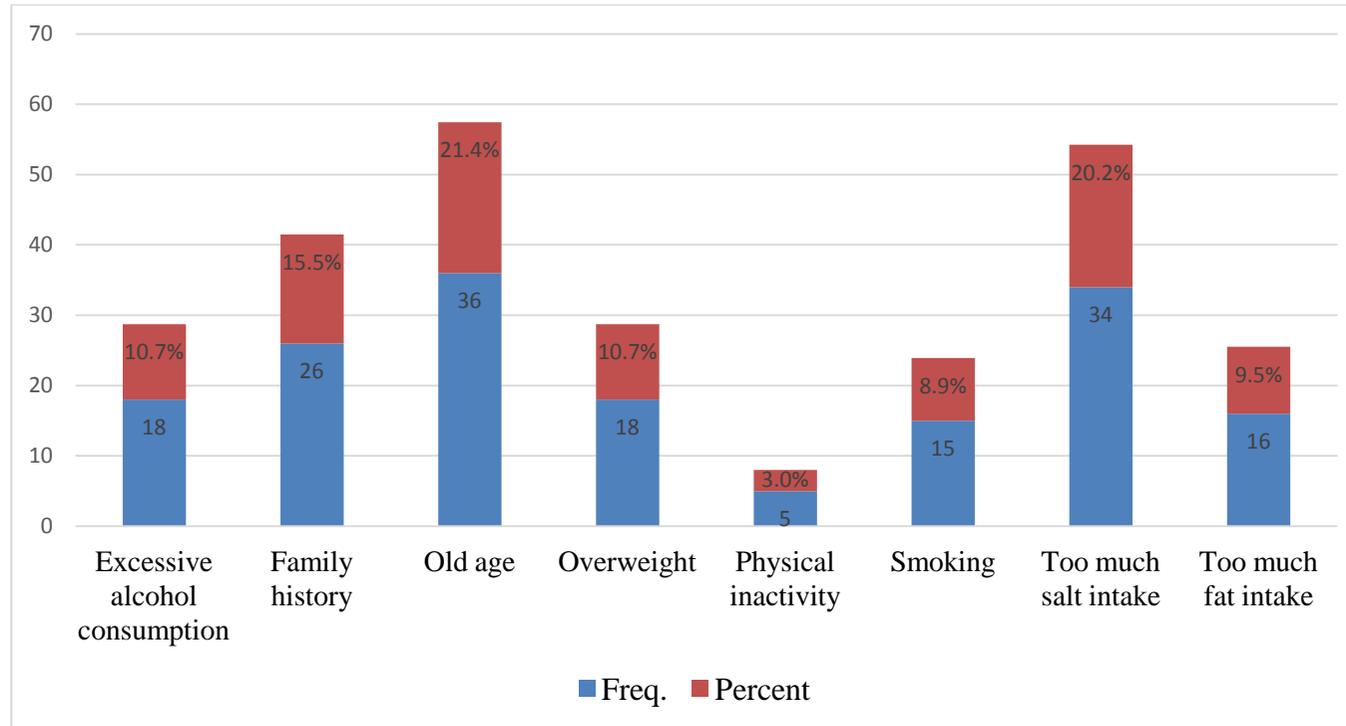
Fig. 2. Knowledge of causes of hypertension by respondents

Table 4. Association of socio-demographic factors with hypertension status

Variables	Non hypertension n (%)	Hypertension n (%)	χ^2	p-value
Age			10.20	0.070
40-49	15 (30.6)	34 (69.4)		
50-59	12 (26.7)	33 (73.3)		
60-69	13 (37.1)	22 (62.9)		
70-79	11 (44.0)	14 (56.0)		
80-89	9 (64.3)	5 (35.7)		
90-99	4 (66.7)	2 (33.3)		
Sex			0.54	0.462
Female	38 (39.2)	59 (60.8)		
Male	26 (33.8)	51 (66.2)		
Marital status			0.55	0.760†
Single	34 (38.6)	54 (61.4)		
Married	26 (36.1)	46 (63.9)		
Divorced	4 (28.6)	10 (71.4)		
Religion			1.89	0.389†
Christianity	34 (38.6)	54 (61.4)		
Islam	30 (36.1)	53 (63.9)		
Traditional religion	0 (0.0)	3 (100.0)		
Education			7.97	**0.047***
None	25 (50.0)	25 (50.0)		
Primary	17 (41.5)	24 (58.5)		
Secondary	9 (25.0)	27 (75.0)		
Tertiary	13 (27.7)	34 (72.3)		
Occupation				
Farmer	15 (33.3)	30 (66.7)	3.27	0.351
Self employed	17 (36.2)	30 (63.8)		
Government worker	3 (20.0)	12 (80.0)		
Pensioner	29 (43.3)	38 (56.7)		

Significant (p<0.05) using chi-square test; †Fisher's exact test, χ^2-chi-square

Table 5. Association of behavioural / lifestyle characteristics with hypertension status

Variables	Non hypertension n (%)	Hypertension n (%)	χ^2	p-value
Physical activity			4.70	**0.030***
No	23 (50.0)	23 (50.0)		
Yes	41 (32.0)	87 (68.0)		
If yes, number of days active			0.00	0.957
1 - 3 days	28 (32.2)	59 (67.8)		
4 or more days	13 (31.7)	28 (68.3)		
Ever consumed alcohol?			0.76	0.382
No	18 (32.1)	38 (67.9)		
Yes	46 (39.0)	72 (61.0)		
Do you currently consume alcohol?			11.90	**0.001***
No	44 (46.8)	50 (53.2)		
Yes	2 (8.3)	22 (91.7)		
Ever smoked cigarette?			1.42	0.233
No	48 (39.7)	73 (60.3)		
Yes	16 (30.2)	37 (69.8)		
Do you currently smoke?			2.39	0.122†
No	16 (33.3)	32 (66.7)		
Yes	0 (0.0)	5 (100.0)		

Variables	Non hypertension n (%)	Hypertension n (%)	χ^2	p-value
Add salt to your food at the table			3.57	0.059
No	16 (51.6)	15 (48.4)		
Yes	48 (33.6)	95 (66.4)		
How often do you add salt to food in a week?			0.20	0.655†
1-3 times	44 (33.1)	89 (66.9)		
4-6 times	4 (40.0)	6 (60.0)		
Do you consume food prepared with oil/fat?			5.79	**0.016†***
No	5 (83.3)	1 (16.7)		
Yes	59 (35.1)	109 (64.9)		
How often do you consume food prepared with oil/fat in a week?			7.49	**0.024†***
1 - 3 times	42 (41.6)	59 (58.4)		
4 - 6 times	14 (22.6)	48 (77.4)		
Everyday	3 (60.0)	2 (40.0)		
Do you consume fruits?			7.04	**0.008†***
No	4 (100.0)	0 (0.0)		
Yes	60 (35.3)	110 (64.7)		
How often do you consume fruit in a week?			18.09	**<0.001†***
1 - 3 times	37 (27.4)	98 (72.6)		
4 - 6 times	22 (66.7)	11 (33.3)		
Everyday	1 (50.0)	1 (50.0)		
Do you consume vegetables?			1.18	0.278†
No	0 (0.0)	2 (100.0)		
Yes	64 (37.2)	108 (62.8)		
How often do you consume vegetables in a week?			29.00	**<0.001***
1 - 3 times	10 (15.9)	53 (84.1)		
4 - 6 times	24 (37.5)	40 (62.5)		
Everyday	30 (66.7)	15 (33.3)		

Significant (p<0.05) using chi-square test; †Fisher's exact test, χ^2-chi-square

Table 6. Association of respondents Knowledge on cause of hypertension with hypertension status

Variables	Non hypertension n (%)	Hypertension n (%)	χ^2	p-value
Do you know the causes/risk factors of hypertension?			3.62	0.057†
No	0 (0.0)	6 (100.0)		
Yes	64 (38.1)	104 (61.9)		
What are the causes/risk factors of hypertension?			20.69	**0.004†***
Excessive alcohol consumption	13 (72.2)	5 (27.8)		
Family history	11 (42.3)	15 (57.7)		
Old age	10 (27.8)	26 (72.2)		
Overweight	10 (55.6)	8 (44.4)		
Physical inactivity	3 (60.0)	2 (40.0)		
Smoking	3 (20.0)	12 (80.0)		
Too much salt intake	12 (35.3)	22 (64.7)		
Too much fat intake	2 (12.5)	14 (87.5)		

Significant (p<0.05) using chi-square test; †Fisher's exact test, χ^2-chi-square

Table 7. Multiple logistic regression analysis for factors associated with hypertension

Variables	Unadjusted OR (95%CI)	p-value	Adjusted OR (95%CI)	p-value
Age				
≤60 years	Ref			
>60 years	1.2 (0.93-3.17)	0.24	1.9 (1.3-2.4)	**0.049***
Education				
None	Ref		Ref	
Primary	1.41 (0.61 - 3.25)	0.417	0.95 (0.13 - 7.03)	0.958
Secondary	3.00 (1.18 - 7.65)	**0.021***	18.91 (1.09 - 327.25)	**0.043***
Tertiary	2.62 (1.12 - 6.10)	**0.026***	3.06 (0.29 - 32.04)	0.351
Physical activity				
No	Ref		Ref	
Yes	2.12 (1.07 - 4.21)	**0.032***	9.89 (0.99 -98.69)	0.051
Do you currently consume alcohol?				
No	Ref		Ref	
Yes	9.68 (2.15 - 43.52)	**0.003***	57.03 (4.48 - 726.59)	**0.002***
Currently smoking				
Yes	Ref			
No	0.24(0.01-0.5)	0.071	0.69(0.1-4.1)	0.213
Do you consume food prepared with oil/fat?				
No	Ref		Ref	
Yes	9.24 (1.05 - 80.92)	**0.045***	Omitted	
How often do you consume food prepared with oil/fat in a week?				
1 - 3 times	Ref		Ref	
4 - 6 times	2.44 (1.19 - 4.99)	**0.014***	23.28 (1.51 - 359.54)	**0.024***
Everyday	0.47 (0.08 - 2.97)	0.425	Omitted	
How often do you consume fruit in a week?				
1 - 3 times	Ref		Ref	
4 - 6 times	0.19 (0.08 - 0.43)	**<0.001***	0.00 (0.00 – 0.07)	**<0.001***
Everyday	0.38 (0.02 - 6.19)	0.495	Omitted	
How often do you consume vegetables in a week?				
1 - 3 times	Ref		Ref	
4 - 6 times	0.31 (0.14 - 0.73)	**0.007***	0.03 (0.00 – 0.50)	**0.016***
Everyday	0.09 (0.04 - 0.24)	**<0.001***	0.00 (0.00 - 0.04)	**<0.001***
Consumption of fruits				
Yes	Ref			
No	0.71(0.10-0.97)	0.471	0.87(0.34-10.7)	0.312
Knowledge on cause of HTN				
Yes	Ref			
No	1.12 (0.14-2.10)	0.074	3.41(1.93-5.17)	**0.032***
What are the causes/risk factors of hypertension?				
Excessive alcohol consumption	Ref		Ref	
Family history	3.55 (0.97 - 12.90)	0.055	26.82 (0.87 - 829.88)	0.060
Old age	6.76 (1.91 - 23.91)	**0.003***	45.61 (1.56 - 1340.57)	**0.027***
Overweight	2.08 (0.52 - 8.34)	0.301	43.08 (0.96 - 1930.25)	0.052
Physical inactivity	1.73 (0.22 - 13.67)	0.602	2.05 (0.023 - 182.13)	0.754

Variables	Unadjusted OR (95%CI)	p-value	Adjusted OR (95%CI)	p-value
Smoking	10.40 (2.03 - 53.20)	**0.005***	86.90 (1.82 - 4148.26)	**0.024***
Too much salt intake	4.77 (1.37 - 16.61)	**0.014***	31.21 (1.09 - 893.20)	**0.044***
Too much fat intake	18.20 (3.00 - 110.68)	**0.002***	0.25 (0.01 - 11.76)	0.482

Significant (p<0.05) using chi-square test; †Fisher's exact test

4. DISCUSSION

This study aimed to determine the prevalence of hypertension and its possible associated risk factors among the residents of Yamfo in the Bono Region. The prevalence of hypertension among the residents was recorded s 63.2%. This result is twice as high compared to a study that was conducted in the middle belt of Ghana by Dosoo et al., [14] in which they established the prevalence of hypertension to be 28.1% (95% CI: 26.3%–29.8%). Mungati et al., [2] reported a 69.7% prevalence of hypertension in Mozawe District Mashaland Central Province in Zimbabwe, which is in agreement with the findings of this study. The figure is much higher than the minimum of 19.0% reported in a systematic review of hypertension studies in Ghana [28].

The majority of the participants (96.6%) had knowledge about the causes/risk factors of hypertension. This was supported by the fact that most of them correctly indicated all the causes and risk factors of hypertension. This is in contrast with a study conducted in which the researchers established a very low knowledge of hypertension among the residents [29]. However, a similar study that was carried out in Zimbabwe also reported high knowledge of hypertension among the study participants [2]. A look at the educational knowledge of the participants seems to be the source of this knowledge as it was the only sociodemographic characteristic that was significant (p<0.047). There was also a significant association between the knowledge of causes/risk factors of hypertension with hypertension (p<0.004).

The adjusted odds ratios revealed that the age of participants was a significant predictor of hypertension. Those >60 years were 1.9 times more likely to have hypertension compared to those who were <60 years. This is expected, as literature has established increasing age to be a risk factor for hypertension. This is not different from the findings of a study conducted in the Middle Belt of Ghana and other parts of the world [14,16,30]. There was a significant association between education and having hypertension. The

highest odds (18.9) were however among those who attained secondary school certificate. Being educated might be an indication of better income, high social standing, and possibly limited physical activity. In contrast, a similar study that was conducted in Accra among a similar population indicated that education was not a predictor of hypertension among the elderly (p=0.077) [29].

The physical activity level of the study participants did not show a significant association in multiple logistic regressions (p=0.51). A similar observation by Boahen [31] was made in a study conducted in Kintampo among the elderly where physical activity was significant at the binary level but lost its significance when fitted in the multiple regression (p= 0.503).

Those currently consuming alcohol had 57 times odd of being hypertensive compared to those who did not. This was statistically significant (p=0.002). A similar study that was conducted in Ghana has established similar results [18]. This significant association was to be expected, because it is known that consumption of alcohol increases the risk of having hypertension.

With regards to the association of the consumption of foods prepared with fat/oil and the frequency of consuming it with having hypertension, it was concluded that both were statistically significant (p=0.016 and p=0.024) respectively. A similar study conducted in Eastern region of Ghana also concluded that consumption of oil was significantly associated with being hypertensive [32].

In addition, consumption of fruits and its frequency in a week were associated with having hypertension. However, there was no difference in risk of hypertension among participants who consumed fruits between 2-3 days compared to those who did so between 4-6 days. This was significant (p<0.001). In contrast to our findings is that of Boahen [31] in which the consumption of fruits did not show any significant association with having hypertension (p=0.690).

The frequency of vegetable consumption was also associated with developing hypertension.

Those who consumed vegetables between 4-6 times weekly had a 3% chance (odds) of being hypertensive compared to those who consumed between 1-3 times weekly (p=0.016). However, those who consumed it daily did not have any risk of developing hypertension compared to those who consumed it between 1-3 times weekly (p<0.001). This finding is in contrast with a similar study that was conducted in a semi-rural community in Ghana [32]. It was indicated in that study that food groups such as legumes and green leafy vegetables have potential benefits for hypertension management [32].

5. CONCLUSION

Hypertension was prevalent among the study participant of age 40 and above, in The Yamfo Community of the Tano North District, Ghana. Residents of the Yamfo community in this study were knowledgeable in hypertension, its risk factors. The majority of the participants added salt to food at table. This should be discouraged during community engagements since this practice alone can increase their blood pressure. The majority of participants had the opinion that hypertension is inevitable, because it comes with old age. Enough education concerning hypertension could be extended to the whole community, about the different equally relevant risk factors of hypertension, such as smoking, alcohol consumption, reduced fruit and vegetable consumption and inappropriate diet. This can be achieved by organizing outreach programs by the community health workers in markets and churches to remit the elderly that they can still be healthy in old age, and at schools and on social media to inculcate positive Health behavior in the youth. This encourages the individual to grow in health.

CONSENT

Respondents were made to understand that their identity would neither be disclosed nor traceable since the questionnaire required the use of codes and not names. Also, completed questionnaires and study documents were kept confidential. The study protocol was explained to participants and a consent form was signed by each respondent before the commencement of the study.

ETHICAL APPROVAL

Permission was granted from the College of Health, Yamfo Ethical Review Committee, and from the Yamfo community leaders before carrying out the study.

DATA ACCESSIBILITY

The corresponding author will give all data upon reasonable request.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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