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Original Research Paper

Prevalence of hypertension and pre-hypertension and awareness among Adults in Keta Municipality of Ghana

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ABSTRACT

Background: Hypertension is a major cause of mortality globally with increasing prevalence annually. This study determined the prevalence of hypertension and pre-hypertension among adults in the Keta Municipality. Methods: A community-based cross-sectional study involving 264 adults 18 years and above. Information was collected using face-to-face interviews with a semi-structured questionnaire. Anthropometric indices, blood pressure were measured using standard procedures. Means were determined using t-test. Chi-square was used to determine associations between independent variables and hypertension. Pearson product moment correlation coefficient was used to determine the direction and strength of the relation between age, BMI, WHR and hypertension. Results: Prevalence of hypertension including those on treatment was 163 (61.7%). At the time of the survey, the prevalence was 146 (55.3%) and pre-hypertension was 32.2%. Of the 163 Hypertensives, only 49 (30.1%) were aware they had hypertension. Uncontrolled hypertension was 32 (65.3%) and undiagnosed hypertension was 114 (53.0%). Increasing age, level of educational attainment, marital status, physical activity, family history of hypertension and WHR of women were independently associated with hypertension. A positive linear correlation was observed between age, BMI and hypertension (r=0.13, p=0.041) and (r=0.07, p=0.230) respectively. Conclusion: Prevalence of hypertension and pre-hypertension was very high, and the majority of those affected are not aware of the diagnosis. Further studies are required to find out reasons for the high hypertension prevalence. Awareness creation would be required to enhance the prevention and control of hypertension in the Keta Municipality.

Key words: Hypertension, Pre-hypertension, Uncontrolled, Undiagnosed, Awareness, Adult population, Community-based, Keta Municipality, Ghana.
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INTRODUCTION

Hypertension is the commonest cardiovascular disorder and an important worldwide public health challenge affecting at least 20% of the adult population in several countries and is the primary risk factor for cardiovascular mortality accounting for 20-30% of all deaths. Hypertension is defined as blood pressure (BP) ≥140/90 mm Hg. Persons with BP above optimal levels (systolic BP ≥140 mm Hg or diastolic BP of ≥ 90mm Hg) are considered as having hypertension (American heart association. 2013).

Hypertension is estimated to cause 7.1 million deaths annually which accounts for 13.0% of the total global deaths. This also accounts for 57 million Disability Adjusted Life Years (DALYS) or 3.7% of total DALYS, (Ahmed *et al.,* 2014). Hypertension is one of the most important causes of premature death worldwide, killing nearly 9.4 million people every year. It is also the primary risk factor responsible for about 1.5 million deaths every year in WHO AFRO Regions, (Aldemir, 2015).

The proportion of women aged 15-49 years who are overweight or obese doubled from 13% in 1993 to 30% in 2008, (Ofori-asenso and Garcia, 2015). About 48% of Ghanaian adults have hypertension and 9% are suffering from diabetes. However, awareness, treatment and control of hypertension were found to be very low in both urban and rural settings of Ghana, (Agyemang, 2006).

Age is one of the non–modifiable risk factors for developing diabetes and hypertension, (Addo *et al.,* 2006). A study carried out in Saudi Arabia showed that 28.3% of people above 40 years were at a higher risk though their family history of diabetes and hypertension was not significant, (Ahmed *et al.,* 2014).

A survey conducted among adults in Accra has shown that systolic and diastolic BP increase progressively with age, (Anane *et al.,* 2015). These trends have been demonstrated in both genders and most ethnic groups. A survey in the Ashanti Region of Ghana found 40% prevalence of Pre-hypertension (readings between 120/80 and 139/89) and 29% prevalence of both pre-hypertensive and hypertensive, (Addo *et al.,* 2006).

One of the vital focuses of the primary prevention of cardiovascular disease has been awareness creation and management or treatment of patients with hypertension. Notwithstanding, the prevalence of hypertension and the gravity of its related complications, significant numbers of hypertensive individuals, particularly in sub-Saharan Africa (SSA) and other developing regions is on the increase. The victims of hypertension are unaware of their conditions. This also comes with inadequate treatment of those diagnosed, (Peer, 2013). A study in Cameroon indicated a low awareness rate among the respondents. The study reported that among the respondents with hypertension, only 32.5% were aware of their condition, (Dzudie, *et al.,*2012). A similar study in Nigeria showed awareness rateof 30% among respondents of which only 9% were under control, (Ekwunife *et al*., 2010).

However, a study in Kenya revealed that 19.5% had a lower level of awareness of which 47% were on antihypertensive treatment. Among those who reported being on treatment, 21.5% had their hypertension controlled to levels below 140/90 mmHg. Hypertension control among all Hypertensives was below 3%, (Vijver *et al.,* 2013).

A study in northern Ethiopia reported that 64% of participants who were hypertensive had ever consumed or were current consumers of alcohol as compared to 28.9% who were non-alcoholics or had never taken alcohol before, (Awoke *et al.,* 2012).

Smoking and tobacco use is one of the modifiable risk factors that can result in chronic conditions, and it is most prevalent among the adult population. Smoking is believed to be the major known cause of HPT. According to the American Heart Association, tobacco use can cause a temporal increase in BP and can contribute to damaging arteries which can worsen the condition of hypertension, (American heart association. 2013).

Hypertension in Ghana was found to be the number three killer disease with a high prevalence rate of 30-40% and a major cause of heart failure, (Owusu-sekyere *et al.,* 2013; Owusu and Adu-boakye 2013). Information from the District Health Information Management System (DHIMS 2) shows that in Ghana the number of people with hypertension reduced from 962,489 in 2012 to 715,247 in 2015 while in the Volta Region, hypertension declined from 116,936 in 2012 to 91,752 in 2015, (VRHD, 2015). The current study aimed at determining the prevalence of hypertension among adults in the Keta Municipality to provide information for further research and interventions.

The Keta Municipal Health Directorate (KMHD) reported that 3,203 hypertension cases were identified in 2015 alone. Available data from the KMHD indicates that hypertension is the 5th most prevalent non-communicable disease in the municipality. It accounts for an average of 8.2% of non-communicable diseases from 2013 to 2015. However, it is observed that, people who have never been diagnosed hypertensive in the Municipality report to the Municipal hospital with hypertension complications. This could be due to the fact that, the people lack knowledge on hypertension, limiting their ability to prevent it. This study, therefore, determined the prevalence and awareness of hypertension and pre-hypertension among adults in Keta Municipality.

MATERIALS AND METHODS

Study area

Keta Municipality is one of the twenty-five (25) administrative districts/Municipalities in the Volta Region of Ghana with a total population of 162,942 people

projected from the 2010 census. It is located in the southeastern part of the Volta estuary The Municipality shares common borders with Akatsi South District to the North, the Gulf of Guinea to the South, South Tongu District to the West and Ketu South District to the East. The administrative capital of the municipality is Keta. It has a total land area of about 1,086 km^2, out of which about a third is covered with water bodies (362m^2). There are six sub-municipalities namely; Keta, Tegbi, Anloga, Anyanui, Shime and Anyako. The municipality has one main ethnic group, the Anlo Ewes, and is endowed with 28 health facilities including 2 Hospitals, 12 health centres, 5 private clinics, 3 private maternity facilities, and 6 functional CHPS zones.

Study population

The study population comprised adults aged 18-64+ years residing in the Municipality. Those who consented to participate were included in this study. Adults not residing in the municipality, seriously ill based on Karnofsky score less than 50, (Karnofsky, Abelmann, Craver & Burchenal, 1948) or did not consent to participate were excluded from this study.

Study design

This was a cross-sectional study carried out in February 2017 among 264 adults in Keta Municipality. A pre-tested, semi-structured questionnaire, modified from the WHO STEPwise approach, (WHO, 2008), to non-communicable disease risk factor surveillance (STEPS) was used to obtain information on the socio-demographic characteristics and anthropometric indices.

Sample size determination

The required sample size was determined using a sample size calculation formula (Degu and Tessema, 2005). Z score of 1.96 at 95% confidence level, the margin of error of 5% and proportion of 30% were entered into the formula to determine a minimum sample size of 216. However, a non-response rate of 5% was applied to the minimum sample size, which was increased to 244 adults.

Sampling method

The multi-stage sampling method was used. The six sub-municipalities were stratified into two groups; urban and rural. Two urban and two rural communities were randomly selected from each sub-municipality. The names of the communities were written on pieces of paper and folded, then grouped into corresponding strata and shaken to ensure they mixed well. Using the lottery method, three persons were blinded and they randomly selected two communities from each stratum. Individual units were interviewed in the selected communities.

Eleven participants were selected from each community making a sample size of 264. For each community, households were randomly selected. Within each study community, the central point was located. Standing at that location, the field worker spun a pointed object. The angle the object took determined the direction to follow. The field worker entered the first house facing him from which a respondent was sampled. If there were more than one eligible respondents in a house, one respondent was randomly recruited. Upon exit from a house, the house whose entrance directly faced the one being exited from was the next compound visited. Thus, the serpentine movement approach aided field workers to identify subsequent houses. Thus, this procedure was repeated until the sample size required was obtained.

Data collection procedure

Community entry was done before data collection. Data was collected using WHO STEPWISE approach for non-communicable disease surveillance (Hypertension) on risk factor assessment with particular emphasis on step 3. **STEP 1** captured information related to nutritional habit, sedentary lifestyle, socio-demographic characteristics, family history of diabetes and hypertension and many others with the use of a questionnaire. **STEP 2** also captured information on weight, height, blood pressure level and BMI (This was done with the use of materials such as an electronic weighing scale, tape measure and digital blood pressure monitor), including STEP 1. In **STEP 3,** the height of participants was measured with a Stadiometer (SECA Leicester height measure with a fixed footplate and movable headboard, USA) to the nearest 0.1 centimetres. The weight was measured with a digital weighing scale (BednBath model BB-3018A, UK) with participants dressed in light clothing to the nearest 0.1 kilograms. All measurements taken were in accordance with the standard anthropometry guidelines. Blood pressure levels of participants were measured with the aid of (Omron M2 Basic manufacturing, Omron Corporation, Japan) digital blood pressure monitor. Participants were allowed to rest for 10 minutes before their blood pressure was measured. Blood pressure was measured at one-minute intervals for 3 three times, of which the average reading was recorded. This digital instrument was used because the exercise was done under field conditions.

Classification of Hypertension

Hypertension was classified based on recommended cut-offs as follows:
Normal: (Systolic BP <120 and Diastolic BP <80 mmHg);
Pre-hypertension: (Systolic BP = 120-139 and/or Diastolic BP = 80-89 mmHg);
Hypertension- Stage I hypertension: (Systolic BP = 140-159 and/or Diastolic BP = 90-99 mmHg) and Stage II hypertension: (Systolic BP > 160 and/or Diastolic BP >

100 mmHg).

Classification of physical activity

Physical activity was estimated by quantifying activities such as carrying light loads, washing clothes, brisk walking to the farm or to the market, scrubbing the floor, and sweeping inside or around the home. Physical activity was re-categorized as ≥3 days in a week and <3 days in a week.

Definitions

Awareness: defined as self-reporting of any prior diagnosis of hypertension by a health care professional (Diagnosed).
Not aware: No prior diagnosis of hypertension by a health care professional (Undiagnosed).
Controlled HPT: Diagnosed with hypertension, on treatment and blood pressure is normal.
Uncontrolled HPT: Diagnosed with hypertension, on treatment or not and blood pressure is high.

Data analysis

Data obtained was entered into EpiData Version 3.1 and exported into Stata/SE version 14.0 for analysis. Body mass index (BMI) was calculated based on WHO criteria as weight (kg) divided by height squared (m^2). Waist-to-Hip Ratio (WHR) was calculated by dividing WC by HC. BMI and WHR were classified based on standard recommendations. Categorical variables were also reported as proportions. Chi-square analysis was used to test for the association between hypertension and background characteristics. The dependent variable was hypertension. Pearson correlation was used to test separately the association between age, BMI ($\text{weight}/\text{height}^2$) and blood pressure. The statistical significance was set at p-value < 0.05.

Ethical Issues

Before commencement of the study, ethical approval was obtained from the Ministry of Health (MoH)/Ghana Health Service (GHS) Ethical Review Committee (MoH/GHS-ERC) with approval number (GHS-ERC:14/03/2017). Permission was sought from the Municipal Assembly and Municipal Health Directorate. Written informed consent was obtained from all the respondents. Each respondent was informed prior to the interview that they were under no obligation to take part and that participation was voluntary. Therefore, they could withdraw at any time and that all answers would be treated with paramount confidentiality. All the adults who agreed to be part of the study signed an informed consent form before data collection.

RESULTS

Table 1 summarizes the demographic characteristics of the respondents. A total of 264 respondents were involved in the study out of which 192(72.7%) were females and 72(22.3%) males. The mean age of respondents was 52.5±16.4 years. The age group of 60+ had the highest number of respondents, 96 (36.4%) followed by the age group of <9, 66 (25.0%) and 50-59, 57(21.6%). Forty-five (17.0) respondents were between the age group 40 and 49. Seventy-three (73) (27.7%) of them never had any formal education, 45 (17.0%) had up to the primary, 89 (33.7%) and 35 (13.3%) of them attained JHS and SHS level of education, respectively. Only 22 (8.3%) of the respondents attained the tertiary level of education. Most of the respondents, 207 (78.4%) were self-employed while 17 (6.4%) were civil servants. There were 15 (5.7%) respondents who were retired and 25 (9.5%) who were unemployed. The majority of the respondents, 150 (56.8%) were married followed by 55 (20.8%) who were widowed. Thirty-three (33) (12.5%) of them were single and 26(9.9%) were divorced. As many as 206 (78.0%) of the respondents were Christians while 50 (19.0%) were Traditionalists and only 8(3.0%) were Muslims.

Prevalence and Classification of hypertension

Figure 1 shows the classification of hypertension among the respondents. A total of 163 (61.7%) of the respondents were hypertensive, 72 (27.3%) were pre-hypertensive and only 29 (10.9%) had normal BP. Out of the 49 respondents who had been diagnosed hypertensive 32 (65.3%) could not control their BP levels (Figure 2). Of the 215 respondents who were not aware of their hypertension status, 114(53.0%) had high BP at the time (undiagnosed Hypertension) (Figure 3). The overall prevalence of hypertension including those on treatment and had it under control, therefore, was 163 (61.7%).

Association between participants' demographic characteristics and hypertension

Table 2 shows the association between respondents' demographic characteristics and hypertension. There was a significant association between age, level of education and marital status and hypertension (χ^2 =10.07, p=0.018), (χ^2 = 12.75, p=0.013) and (χ^2 = 14.88, p=0.002,), respectively. There was, however, no significant association between sex, religious affiliation and HPT.

Association between awareness and hypertension

Table 2 shows that there was no significant association between awareness of hypertension status and hypertension ($\boldsymbol{\chi^2}$ =37.28, p=<0.001). A total of 49 (18.6%) respondents were aware or had been diagnosed hypertensive. However, at the time of the survey 32 (65.3%) of them had high BP (Uncontrolled hypertension). Out of the 215 who were not aware, 114

Table 1. Background characteristics of the respondents.

Characteristics	Frequency [N=264] (n)	Percent (%)
Age group (years)		
<40	66	25.0
40-49	45	17.0
50-59	57	21.6
>60	96	36.4
Sex		
Male	72	27.3
Female	192	72.7
Educational level		
No education	73	27.6
Primary	45	17.1
JHS	89	33.7
SHS	35	12.3
Tertiary	22	8.3
Occupation		
Unemployed	25	9.5
Civil servants	17	6.4
Self employed	207	78.4
Retired	15	6.7
Marital status		
Single	33	12.5
Married	150	56.8
Divorced	26	9.8
Widowed	55	20.8
Religion		
Christian	206	78.0
Muslim	8	3.0
Traditional	50	18.9
BMI		
Underweight	7	2.7
Normal	101	38.3
Overweight	73	27.6
Obese	83	31.4
WHR men		
Low risk	59	81.9
Moderate risk	11	15.3
High risk	2	2.8
WHR women		
Low risk	24	12.5
Moderate risk	46	24.0
High risk	122	63.5
WHR All		
Low risk	83	31.4
Moderate risk	57	21.6
High risk	124	47.0
Physical exercise per week		
No physical exercise	208	78.8
1 day	8	3.0
2-3 days	16	6.1
More than 3 days	32	12.1
Classification of Hypertension		
Normal	29	10.9
Pre-hypertensive	72	27.3
Hypertensive	163	61.7
Awareness		
No	215	81.4
Yes	49	18.6

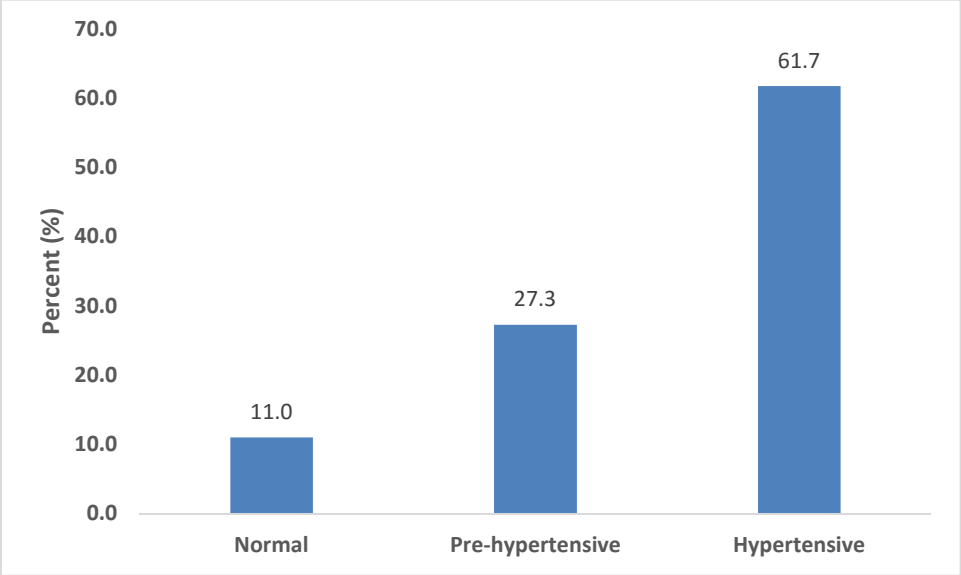

Figure 1. Classification of hypertension among adults in the Keta Municipality

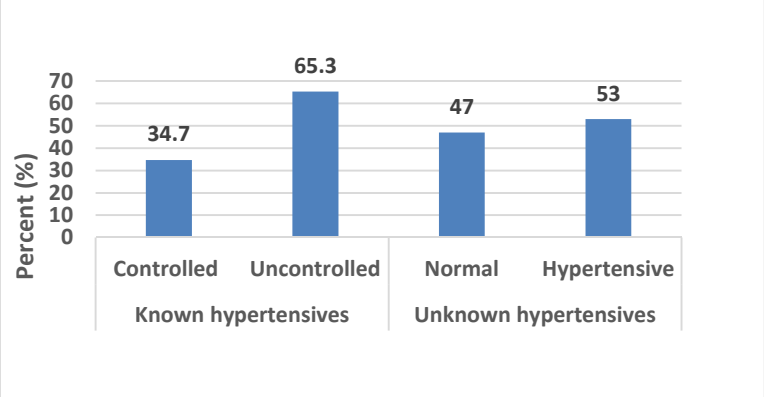

Figure 2. Prevalence of Hypertension among adults who were aware and those who were not aware of their status.

(53.0%) were hypertensive.

Association between participants' BMI, Waist-to-Hip ratio and hypertension

Table 2 shows that there was a significant association between BMI, WHR for women and hypertension (χ^2 = 8.39, p=0.039 and (χ^2 =7.67, p=0.022), respectively.

Association between participants' physical activity, family history of hypertension and hypertension

There was a significant association between physical activity per week, family history of hypertension and hypertension (χ^2=7.49, p=0.058,) and (χ^2=24.45, p<0.001) respectively (Table 2).

Correlation between BMI, Waist-to-Hip ratio and hypertension

Table 3 shows that there was a weak positive but significant correlation between age and HPT (r=0.13, p=0.038, α=0.05). There was also weak positive but not significant correlation between BMI and HPT (r=0.12, p=0.042, α=0.05).There was no correlation between waist-to-hip ratio and hypertension (r=0.12, p=0.047, α=0.05).

DISCUSSION

Hypertension is an important public health problem

Table 2. Association between risk factors and hypertension

Characteristics	Hypertension		Total [N=[264]	Chi-square (p-Value)
	Normal [N=101] n (%)	**Hypertensive [N=163] n(%)**		
Age group				
< 40 years	36 (35.6)	30 (18.4) 30 (18.4)	66 (25.0)	
40-49 years	14 (13.9)	31 (19.0)	45 (17.0)	10.07 (0.018)
50-59 years	18 (17.8)	39 (23.9)39 (23.9)39 (23.9)	57 (21.6)	
60+ years	33 (32.7)	63 (38.7)	96 (36.4)	
Sex				
Male	27 (26.7)	45 (27.6)	72 (27.3)	
Female	74 (73.3)	118 (72.4)	192 (72.7)	0.02 (0.877)
Level of education				
None	17 (16.8)	56 (34.4)	73 (27.6)	
Primary	18 (17.8)	27 (16.5)	45 (17.1)	
JHS	37 (36.7)	52 (31.9)	89 (33.7)	12.75 (0.013)
SHS	20 (19.8)	15 (9.2)	35 (13.3)	
Tertiary	9 (8.9)	13 (8.0)	22 (8.3)	
Occupation				
Unemployed	10 (9.9)	15 (9.2)	25 (9.5)	
Civil servants	7 (6.9)	10 (6.1)	17 (6.4)	2.28 (0.517)
Self employed	81 (80.2)	126 (77.3)	207 (78.4)	
Retired	3 (3.0)	12 (7.4)	15 (5.7)	
Marital status				
Single	21 (20.8)	12 (7.4)	33 (12.5)	
Married	53 (52.5)	97 (59.5)	150 (56.8)	
Divorced	13 (12.9)	13 (7.9)	26 (9.9)	14.88 (0.002)
Widow	14 (13.8)	41 (25.2)	55 (20.8)	
Religion				
Christian	79 (78.2)	127 (77.9)	206 (78.1)	
Muslim	4 (4.0)	4 (2.5)	8 (3.0)	0.58 (0.750)
Traditional	18 (17.8)	32 (19.6)	50 (18.9)	
Physical activity per week				
No physical activity	79 (78.2)	129 (79.1)	208 (78.8)	
1 day	3 (3.0)	5 (3.1)	8 (3.0)	
2-3 days	2 (2.0)	14 (8.6)	16 (6.1)	7.49 (0.058)

Table 2. (Cont'd).

More than 3 days	17 (16.8)	15 (9.2)	32 (12.1)	
Family history of HPT				
No	76 (75.3)	72 (44.2)	148 (56.1)	
Yes	25 (24.7)	91 (55.8)	116 (43.9)	24.45 (<0.001)
BMI				
Underweight	1 (1.0)	6 (3.7)	7 (2.7)	
Normal	49 (48.5)	52 (31.9)	101 (38.3)	
Overweight	25 (24.8)	48 (29.4)	73 (27.6)	8.39 (0.039)
Obese	26 (25.7)	57 (35.0)	83 (31.4)	
WHR men				
Low risk	24 (88.9)	35 (77.8)	59 (81.9)	
Moderate risk	2 (7.4)	9 (20.0)	11 (15.3)	2.14 (0.343)
High risk	1 (3.7)	1 (2.2)	2 (2.8)	
WHR Women				
Low risk	15 (20.3)	9 (7.6)	24 (12.5)	
Moderate risk	19 (25.7)	27 (22.9)	46 (24.0)	7.67 (0.022)
High risk	40 (54.0)	82 (69.5)	122 (63.5)	
WHR All				
Low risk	39 (38.6)	44 (27.0)	83 (31.4)	
Moderate risk	21 (20.8)	36 (22.1)	57 (21.6)	4.14 (0.126)
High risk	41 (40.6)	83 (50.9)	124 (47.0)	
Awareness				
No	101 (100.0)	144 (69.9)	215 (81.4)	
Yes	0 (0.0)	49 (30.1)	49 (18.6)	37.28 (<0.001)

Table 3. Correlation between BMI, Waist-to-Hip ratio and hypertension.

Variable	Hypertension	
	R	**p-value**
Age	0.13	0.038
BMI	0.12	0.042
WHR All	0.12	0.047

across the globe. The findings of this current study revealed an overall prevalence of hypertension including those on treatment of 61.7%. At the time of the survey, the prevalence of hypertension among the adult population was 55.3%. This finding is far higher than what was reported among traders in Hohoe Municipality

where the prevalence was 28.4% (Bani *et al.,* 2017). The difference between the current study and that of Hohoe may be partly due to the specific population (traders) which was surveyed in the Hohoe study. The finding of the current study is similar to what was reported among Ghanaians in Amsterdam (Agyemang *et al.,* 2013), where the prevalence of HPT was high, 55%, and could be attributed to the migration from SSA to an industrialized country.

Awareness of hypertension was defined as self-reporting of any prior diagnosis of hypertension by a health care professional. Out of the 163 who were hypertensive during the survey, 30.1% had been diagnosed. The low awareness in this current study is in agreement with what was reported from Cameroon [9] (Dzudie *et al.,* 2012). Their study reported that among the respondents with hypertension, 32.5% were aware of their condition. Another study conducted in Nigeria also reported 30% of awareness rate among respondents ((Ekwunife *et al.,* 2010).

Out of the 49 respondents who were aware that they were hypertensive, 32 (65.3%) were not able to control their BP (uncontrolled HPT). This is far higher than what was reported from Cameroon where 24.6% of those with HPT could not control their blood pressure (Dzudie *et al.,*2012).

The current study also found age, education, marital status, physical activity, family history of hypertension and WHR for women to be significantly associated with developing hypertension. This finding was found to be consistent with studies carried out among traders in Hohoe (Bani *et al.,* 2017).

Education was also found in the current study to be significantly associated with hypertension. This is in agreement with what was found in another study (Tee *et al.,* 2010), which reported a significant association between hypertension and education level of the study respondents (p=0.020).

The findings from the current study showed marital status to be significantly associated with developing hypertension (p=0.013). This is contrary to what was found among Malaysian elderly (Eshkoor *et al.,* 2016). The current study found marital status to be associated with hypertension (p=0.013). This finding is in line with what was found in the United States of America (Holmes *et al.,* 2013) and in South Africa (Ntuli *et al.,* 2015) where marital status was found to be significantly associated with hypertension.

Our findings also indicated a family history of hypertension to be significantly associated with HPT (p<0.001). This corroborates with findings from other studies (Ranasinghe *et al.,* 2015) where a family history of hypertension was found to be significantly associated with developing HPT.

This current study also revealed that WHR was associated with developing hypertension (p=0.021). This finding is in contrast with what was found in another study (Tee *et al.,* 2010), where WHR was found not to be significantly associated with hypertension.

Limitations

The diagnosis of hypertension was based on a mean of three blood pressure measurements at one sitting and this may have affected the overall prevalence of hypertension in this study. The study also identified bias on the part of the respondents as one of the limitations.

Conclusion and Recommendation

Prevalence of hypertension and pre-hypertension was very high in the Keta Municipality. Six out of 10 adults had hypertension whilst 7 out of 10 with hypertension could not control their blood pressure. More than half (53.0%) of the adult's population were walking about with high blood pressure and were not aware. Hypertension was associated with increasing age, the level of education attainment, marital status, physical activity per week, a family history of hypertension and waist-to-hip ratio of women. Pre-hypertension was also very high in the Municipality. Periodic screening programmes would be required to help identify those with HPT and pre-hypertension for a referral to the hypertension clinic for treatment and counselling. Health education and promotion on hypertension should be intensified to create awareness among the general population. Further studies are required to investigate the reasons for the high prevalence of HPT among adults in the Keta Municipality.

List of abbreviations

WHO-AFRO: World Health Organization African regional office, BP: Blood Pressure, HBP: High Blood Pressure, HPT: Hypertension, DALYs: Daily Adjusted Life Years, CVD: Cardio Vascular Disease, NCDs: Non-Communicable Diseases, OPD: Out-Patient Department, WHO: World Health Organization, USA: United States of America, UK: United Kingdom, UHAS: University of Health and Allied Sciences, SPH: School of Public Health, GHS-ERC: Ghana Health Service- Ethical Review Board, DHMIS: District Health Management Information System.

Availability of data and material

Available upon request.

Competing interests

The authors declare that they have no competing interests.

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