

Physical, Behavioral and Sociodemographic determinants of hypertension among adult population in Nekemte town, western Ethiopia: Community based study.

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Abstract

Objectives Although hypertension is a growing public health problem in many developing countries there is inadequacy of scientific evidences on community based level of hypertension among the population. The study aimed at exploring prevalence and associated factors of hypertension among adults in Nekemte town, Ethiopia. Community based cross sectional study was conducted on 711 adults selected by multistage sampling procedure and data obtained by interview. Height, Weight, Blood Pressure and waist circumference were measured with standard procedures. Data was analyzed by SPSS 20 version and multiple logistic regression models were used to determine the independent risk factors for hypertension. **Result** The overall prevalence of hypertension was 34.9% of which only about half (52.7%) of them knew that they were hypertensive and only 22.4% of them were on medication. Older age; age group >65 year (AOR =5.85, 95% CI; 1.74-20), 41-64 year (AOR = 2.6, 95% CI; 1.49-4.57), Obesity and overweight (AOR =1.71, 95% CI; 1.09-2.67), chat chewers in the past year (AOR =2.44, 95% CI; 1.05-5.68) and lower educational status (AOR =2.75, 95% CI; 1.26-6.03) had higher risk of hypertension.

Introduction

WHO defines hypertension as systolic Blood Pressure (BP) ≥ 140 mmHg or diastolic BP ≥ 90 mmHg, and any prior diagnosis of hypertension made by a health professional and taking antihypertensive drugs (1-3). Primary hypertension accounts for 80-90% of cases of hypertension and has no known cause. Secondary hypertension which accounts for 5-20% is less common type and has different causative factors that could be curable (1). Hypertension is the leading risk factor for mortality followed by tobacco use and Diabetes mellitus (DM) and it is the fifth cause of Disability-adjusted life years lost (DALYs)(3). Hypertension doubles the risk of CVD, including Coronary heart disease (CHD), Congestive heart failure (CHF), ischemic stroke and hemorrhagic stroke, renal failure and Peripheral arterial disease (PAD). Systolic blood pressure is an attributing factor of 51% and 45% of deaths due to stroke and ischemic heart disease respectively (1-3).

Hypertension has been thought of as a disease of affluence but now it is becoming rampant in developing nations and its distribution is increasing in Africa than Europe and America (4). The Global average of the prevalence of hypertension is about 40% and the distribution is different in different regions, being highest in Africa, 46 % (2). The numbers of undiagnosed, untreated and uncontrolled hypertension cases and the Risk of dying from hypertension and related morbidities are higher in developing countries than the high-income countries (2, 4, and 5).

The burden of morbidity and mortality due to chronic illnesses is increasing in developing countries shifting from communicable diseases to non-communicable diseases (6, 7). According to the world health (WHO) report, 67% of mortality in low and middle-income countries was contributed by non-communicable diseases of which CVD shares 48% (5). Hypertension is the commonest cause of CVD in Africa and will be among the leading cause of mortality in the coming few years. WHO survey between 2003 and 2009 in 20 African countries showed that prevalence from 19.3 to 39.6% in different countries

(6, 7). There is evidence that non-communicable disease particularly hypertension and its complications are increasing in Ethiopia (8-10).

The prevalence of hypertension can be affected by different factors which can be modifiable or non-modifiable. Family history of hypertension, age, lifestyle and environmental factors are among the factors affecting the prevalence of hypertension (11-15).

Another behavioral factor which becoming rampant in Ethiopia and could be related to hypertension is frequent chewing of khat. According to research done in Addis Ababa Current daily smoking and regular khat chewing were significantly associated with elevated mean diastolic blood pressure (15).

Psychological distress such as anxiety, depression, and anger/hostility has been found to contribute to the development of hypertension (16-19).

This study aimed at studying the prevalence of hypertension and the physical, behavioral and Sociodemographic determinants among adult populations in Nekemte town, Ethiopia.

Methods

Study setting and design:

The community-based cross-sectional study was conducted Nov. 2015 to Dec. 2015 on the adult population aged 18 and above and residing in Nekemte town. The required sample size of the study (711) was determined using single finite population proportion formula by considering: prevalence of hypertension 30% from the study done in Addis Ababa and 10% possible non-response rate and design effect 2.

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{d^2}$$

Sampling procedure:

The study participants were identified by the multistage sampling technique.

Variables:

Dependent variable: Prevalence of hypertension.

Independent variable: Age, Sex, Ethnicity, marital status, educational status, family Income, accessibility of Screening program, alcohol consumption, smoking, chewing khat, diet, physical exercise, and psychological stress.

Data collection procedure:

Data were obtained on socio-demographic characteristics and lifestyle behaviors including, physical activity, and physical measurements of weight, height, waist circumference, as well as blood pressure. Data was collected by 5 health extension workers supervised by experienced BSc nurses. One day training was given on how to measure BP, weight, height and waist circumference by the investigator and two supervisors. Weight and height were measured with participants standing without shoes position and height was recorded to the nearest 0.5 cm, and weight was measured by the Digital weight scale and recorded to the nearest 100 g. BMI was calculated as weight in kilograms over height in meters squared [weight (kg)/ (height (m))²]. Waist circumference was measured at the level the mid-way between the level of the iliac crest and lowest margin rib margin using a non-elastic tape measure. Blood pressure was measured in a sitting position with supported back using a mercury sphygmomanometer and stethoscope after the participants rested for at least 5 minutes and the participants had no coffee drinking, cigarette smoking and strenuous exercise with an hour of BP measurement with standard procedure with 2-3 cm above ante-cubital fossa for placement of stereoscope and the bladder encircled at least 2/3 rd. the arm. The accuracy of the mercury sphygmomanometers was seen by checking that the upper curve of the meniscus of the mercury column is at 0 mm Hg, that the column was free of dirt, and that it rose and fell freely during cuff inflation and deflation. The measurement was done in both arms at sitting position with back supported and the larger one was taken. Two consecutive measurements of blood pressure were taken 2 minutes apart from all study participants. The average of the two measurements was used for analysis (20, 21).

Data processing and analysis:

Data were cleaned and entered into a computer and analyzed using SPSS Windows Version 20. Descriptive analysis was done using numbers and percentages. The presence of a statistical association between dependent and independent variables was assessed. Multiple Logistic regression analysis was done to assess independent risk factors for hypertension.

Result

Socio-demographic and socio-economic characteristics of respondents:

Seven hundred five (with a response rate of 99.2%) participants were included in this study with the mean(\pm SD) age of 33.24 \pm 0.942 years with a maximum of 80 years and a minimum of 18 years. The majority (78.3%) of them are with 1st age group (18-40 years), the 2nd age groups (41-64 years) contains 18% of them and the remaining proportion (3.7%) are within 3rd age group(\geq 65 years). More than half of the respondents (61.6%) were females. The majority of the respondents (64%) were protestant Christians. In Ethnicity Oromo constitute the majority of the respondents with 89.8%. Refer table 1 below for detail Sociodemographic variables of the respondents.

Table 1: Sociodemographic characteristics of respondents in Nekemte town, Western Ethiopia, Dec. 2015 (n=705).

Variables	Frequency(in N)	Percentage (in %)
Age groups:		
18-40 year	552	78.3
41-64 year	127	18.0
≥65 year	26	3.7
Sex:		
Male	271	38.4
Female	434	61.6
Religion:		
Protestant Christian	451	64.0
Orthodox Christian	220	31.2
Muslim	24	3.4
Catholic Christian	2	.3
“Wakefeta	8	1.1
Ethnicity:		
Oromo	633	89.8
Amharic	60	8.5
Gurage	6	.9
Tigre	4	.6
Others	2	.3
Education status:		
No formal education.	75	10.7
Primary school.	119	16.9
Secondary school.	320	45.5
College and above	189	26.9
Marital status:		
Never married	253	35.7
Currently married	392	55.6
Divorced	14	2.0
Widowed	45	6.4
Occupation:		
Gov. employee	150	21.2
NGO employee	44	6.3
Self employed	195	27.7
Student	194	27.6
Home maker	10	1.4
Retired	15	2.1
Unemployed	98	13.8

Prevalence of hypertension:

The mean systolic and diastolic BP readings were 119.8 (± 1.2) and 81.9(± 0.9) mmHg, respectively. The overall prevalence of hypertension was 34.9% ($\pm 3.6\%$ CI: 31.3-38.5): it is 36.9% among male respondents and 33.6 among female respondents. Only 53.3% of respondents ever measured their BP and out of hypertensive respondents, only 52.7% of them knew or told that they have a raised BP and only 22.4% of them were on anti-hypertensive medications.

Descriptions of behavioral, physical and nutritional factors:

Only 1.4% of the respondents have ever smoked cigarettes. Regarding alcohol consumption, 13.9% of the respondents had regular alcohol drinking habit and 6.2% had cat chewing habits. When we see dietary behavior of respondents; most of the respondents (83.6%) have a habit of high consumption of Salt and only 3.2% & 5.3% of the respondents have an adequate intake of vegetables and fruit on regular bases. As to physical exercise; 18% of them were engaged in vigorous physical activity work-related, recreational and sport-related, 52.2% of them were engaged in moderate activities and 29.8% were not involved in either of these activities. As to the Nutrition status of respondents, 62.6% of respondents have normal BMI, 16.7% were underweight, 11.2% were overweight and 9.5% were obese of which 21.6% had central obesity.

Risk factors associated with hypertension:

To identify factors associated with prevalence of hypertension, age, sex, occupation, income, educational status, BMI, family history of hypertension, smoking, alcohol consumption, sedentary lifestyle and khat chewing status were entered in bivariate logistic regression analyses and showed that age, BMI, sedentary lifestyle, education status, family history of hypertension, self-history of Diabetes mellitus (DM), alcohol drinking status and Khat chewing were significantly associated with prevalence of hypertension. However, controlling for other variables on multivariate logistic regression, only age, BMI, educational status and Khat chewing were associated with the prevalence of hypertension (Table 2).

Table 2: Multiple logistic regression analysis of factors associated with Hypertension among respondents in Nekemte town, Western Ethiopia, Dec. 2015 (n=705)

Variables	Hypertension		COR(95% CI)	AOR(95% CI)
	Yes (%)	No (%)		
Age group(year)				
18-40	156(28.3%)	396(71.7%)	1	1
41-64	70(55.1%)	57(44.9%)	3.12(2.1,4.63)	2.6(1.49,4.57)
≥65 year	20(76.9%)	6(23.1%)	8.47(3.33,21.28)	5.85(1.72,20)
BMI				
Normal	148(33.6%)	293(66.4%)	1	1
Underweight	16(20.3%)	63(79.7%)	0.63(0.45,0.9)	0.48(0.22,1.05)
Overweight/ Obese	82(44.3%)	55.7(55.7%)	3.14(1.69,5.83)	1.71(1.09,2.67)
Central obesity				
Yes	74(48.7%)	78(51.3%)	2.1(1.46,3.03)	
No	172(31.1%)	381(68.9%)	1	
Exercise level:				
Vigorous	34(26.8%)	93(73.2%)	1	1
Moderate	128(34.8%)	240(65.2%)	1.46(.93,2.28)	.85(.48,1.5)
None	84(40%)	126(60%)	1.82(1.13,2.95)	1.11(.57,2.14)
Alcohol intake ever:				
Yes	45(45.9%)	53(54.1%)	1.72(1.11,2.64)	.94(.5,1.78)
No	201(33.1%)	406(66.9%)	1	1
Chewed Khat past year:				
Yes	24(54.5%)	20(45.5%)	1	1
No	222(33.6%)	439(66.4%)	2.38(1.28,4.39)	2.44(1.05,5.68)
Monthly Income (ETB) <1500				
1500-4000	59(27.2%)	158(72.8%)	1	
4000-6000	100(41.3%)	142(58.7%)	1.89(1.27,2.79)	
≥6000	20(60.6%)	13(39.4%)	4.12(1.93,8.77)	
	12(26.7%)	33(27.3%)	.97(.48,2.01)	
Education status:				
No formal edu.	53(70.7%)	22(29.3%)	1	1
Primary Complete	45(37.8%)	74(62.2%)	3.96(2.13,7.36)	1.63(.72,3.69)
Secondary Complete	97(30.3%)	223(69.7%)	5.52(3.19,9.61)	2.38(1.11,5.09)
College and above	49(25.9%)	140(74.1%)	6.88(3.8,12.47)	2.75 (1.26,6.03)
Self-report of DM:				
Yes	14(53.8%)	12(46.2%)	2.25(1.02,4.95)	1.75(.625,4.88)
No	232(34.2%)	447(65.8%)	1	1
Family history of HTN:				
Yes	123(44.2%)	155(55.8)	1.40(1.02,1.92)	1.34(.88,2.03)
No	151(35.4%)	276(64.6%)	1	1

Discussion

This study revealed that about a third of the adult population in the town (18 years and above) had hypertension. This is comparable with the WHO estimate of the prevalence of hypertension in Ethiopia

which is 31%. The result is higher than a similar study done in the Northern part of the country (28%) and is comparable with the study done elsewhere (8-10, 22). The finding is higher as compared with surveys in Eritrea (16%) and Ghana (29.4%) (23,24). However, this study showed a lower prevalence as compared with WHO estimate of the prevalence of hypertension in Africa which is 46 % (5). This variation may be explained by variability in different age groups, the prevalence in different proven risk factors, and the difference in the definition of hypertension (taking those respondents which told to have hypertensive /those only on medications as hypertensive may explain this difference.) and genetic/racial difference.

In this study, age, BMI, educational status and Khat chewing had a positive association with the prevalence of hypertension. With regards to sex, similar to studies done in Gondar, Addis Ababa, Durame and Bedele towns of Ethiopia, it didn't show association (8-10). The prevalence of hypertension was higher in overweight and obese (44.3%) than those of normal (33.6%) and underweight (20.3%). This is consistent with other studies (8-10). This study found an association between chewing Khat in the past one year (54.5%) and hypertension. This is similar to the study done Addis Ababa but not the case for a study done in Bedele (10, 15).

Conclusion

The prevalence of hypertension was found to be high among adults older than 18 years in Nekemte town. Older age, higher educational status, overweight/obesity, and Khat chewing were associated with a high prevalence of Hypertension. Community-based health promotion and screening programs should be available and further researches with biochemical data should be done.

Limitation:

As there could be recall bias as some of the participants may not remember how regularly they behave. There may be hiding of different socially unacceptable behaviors like alcohol intake; cigarette smoking and Khat chewing this may lead to underestimation of these factors. This study did not include the biochemical factors of hypertension.

Abbreviations

BP: Blood Pressure; DALYs: Disability-adjusted life years; CVD: Cardiovascular Disease; CHF: Congested heart Disease; WHO: World health organization; BMI: Body Mass Index; DM: Diabetes Mellitus.

Declarations

Ethics approval and consent to participate:

Ethical clearance was obtained from Wollega university ethical clearance committee before data collection. Written informed consent was obtained from all participants for participation in this research.

Consent for publication:

Written Consent has been obtained from the participants.

Availability of data and material:

The data sets during and/or analyzed during the current study available from the corresponding author on reasonable request.

Competing interests:

The authors declare that they have no competing interests.

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GT generated the research question, developed the proposal, supervised the data collection process, analyzed data and prepared the research report.

MC was the senior advisor of the research proposal development and data analysis process.

EM was co-advisor of the research proposal development and data analysis process.

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