

# Prevalence of hypertension and associated factors among adult population between the ages of 25-64 in Humbo districts of Woliata Zone

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Abebe S, Pauloset W. Prevalence of hypertension and associated factors among adult population between the ages of 25-64 in Humbo districts of Woliata Zone. *J Heart Res* 2024;6(5):1-8.

## ABSTRACT

**Background:** One of the main risk factors for other Non-Communicable Diseases (NCDs) and the greatest risk factor for death is hypertension. This study's goal is to identify the prevalence of hypertension and related variables in the adult population, ages 25 to 64.

**Methods:** Between January and February 2020, a cross-sectional study with a community based was carried out among adults in the Humbo district of southern Ethiopia who were 25 to 64 years old. To choose 587, a multi-stage sampling approach was employed. Blood pressure, height, and fasting blood glucose levels were all measured. Epi Data version 3.1 was used to enter the data into the computer, which was then exported to SPSS version 20 for

analysis. The statistical significance was set at a p-value <0.05 after descriptive statistics, bivariate and multivariate logistic regression analyses were conducted.

**Results:** The overall prevalence of hypertension among the study subjects was 17.8% (95% CI: 14.7-21.1). Multivariable logistic regression showed that; age 55-64 years with (AOR=2.88, 95% CI: (1.13, 7.32), family history of hypertension (AOR=3.14, 95% CI: (1.60, 6.17), alcohol use (AOR=8.84, 95% CI: (3.00, 26.10), BMI (AOR=2.34, 95% CI: (1.01, 5.40) were significantly associated with hypertension.

**Conclusion:** There was a very high prevalence of hypertension. The health system must create ways to expand the availability of pertinent screening and diagnostic services.

**Keywords:** Non-communicable diseases; Hypertension; Prevalence; Humbo; Cardiovascular illnesses

## INTRODUCTION

Chronically high systemic blood pressure is a hallmark of hypertension, a chronic cardiovascular illness with several, and interconnected etiologies [1]. It is linked to deadly consequences such peripheral arterial disorders, congestive heart failure, coronary artery disease, and cerebrovascular accidents [2]. A major global problem that contributes to a large number of disability adjusted life years is high blood pressure, specifically Systolic Blood Pressure (SBP) more than or equal to 140 mmHg and Diastolic Blood Pressure (DBP) greater or equal to 90 mmHg [3,4]. Nearly one third of all fatalities worldwide, or 17 million per year, is caused by cardiovascular disease. Worldwide, complications from hypertension (HTN) account for 6% million of these fatalities each year [5]. Additionally, at least 45% and 51%, respectively, of fatalities from heart disease and stroke are thought to be caused by HTN. About 40% of persons in the globe who are 25 or older had HTN diagnoses in 2008 [6]. In the industrialized world, hypertension is a very common risk factor for cardiovascular illnesses (CVDs). Due to the rising prevalence of contributing factors including obesity, inactivity, and poor diet, it is becoming a more widespread health issue on a global scale [7]. Many developing nations currently see prevalence levels comparable to those found in affluent ones, particularly in urban settings [8]. According to estimates, hypertension accounts for 4.5% of all diseases and 7.1 million premature deaths annually. One billion people had hypertension in the year 2000 and 1.56 billion people are expected to have this condition by 2025 [9]. It is estimated that between 10 million and 20 million people in Sub-Saharan Africa have hypertension. It has also been estimated that adequate hypertension treatment of these people could prevent about 250,000 deaths. However, hypertension in Sub-Saharan Africa is universally under diagnosed or inadequately treated hence extensive end-organ damage and premature death are often seen. Furthermore, hypertension frequently co-exists with other NCD risk factors, such as diabetes [10]. There are risk factors that increase the chances of developing high blood pressure. Of which, smoking, diabetes, being obese or overweight, high cholesterol,

unhealthy diet and physical inactivity can be controlled. However, history of high blood pressure, ethnicity, age and gender cannot be modified. However, evidence-based data related to prevalence of selected non communicable diseases (hypertension and diabetes) are insufficient in Ethiopia. Therefore, this study was intended to assess the prevalence of hypertension and associated factors among adult population between the ages of 25-64 in Humbo districts of Woliata Zones.

## MATERIALS AND METHODS

### Study setting and area

The study was conducted in Humbo District, Wolaita Zone, and Southern Ethiopia. This research was conducted in Humbo Woreda, Wolaita Zone. It is located at 418 km South from Addis Ababa. Agro-ecology of the Woreda is 30% moderate or Woynadega and 70% lowland or "kola". The average temperature ranges between 15°C and 29°C and the altitude ranges from 1100 to 2800 m above sea level. The population of the Woreda is estimated to be 162,306 in 2016; of the total population, 50.3% and 49.7% are males and females respectively. The total households of the Woreda are estimated to 20,223; of which 16,519 are rural dwellers and 3,704 are urban dwellers.

### Study design, period and population

A community based cross-sectional study was employed. All adult men and women aged 25-64 years residing in Humbo Districts of Woliata Zones. The study population consisted of all randomly selected adults 25-64 years age population.

### Sample size determination

Sample size for the first objective was determined by using single population proportion formula with the following assumption. Sample size determination and procedures according to the WHO STEPS guideline for

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**Received:** 23-May-2023, Manuscript No. PULJHR-23-6452; **Editor assigned:** 26-May-2023, PreQC No. PULJHR-23-6452 (PQ); **Reviewed:** 12-June-2023, QC No. PULJHR-23-6452; **Revised:** 24-Jan-2024, Manuscript No. PULJHR-23-6452 (R); **Published:** 31-Jan-2024, DOI No.10.37532/puljhr.2024.6(5).1-8



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sample size calculation, the study population was categorized into eight groups based on the four age and sex categories. The prevalence of hypertension in Durame Town, Southern Ethiopia was considered for the calculation of the sample size, which was 22.4%. Using a single population proportion formula and design effect of 1.5, the estimated sample size for a group was 396. With the consideration of a 5% non-response rate and eight groups to have an adequate level of precision for each age-sex estimate, the final sample size was 587. A multistage sampling was employed in this study. In the district, there are 41 kebeles from which 2 of them are urban. Then, ten kebeles were selected by using lottery method to get representative samples of the population. The study participants were selected from the target population through a multistage sampling technique and proportional to size of the households from each selected kebele of the districts.

The calculated sample size of 587 was distributed among each selected kebele proportional to the size of the population in each administrative unit. Then, after determining the number of individuals to be studied in each kebele, the sample size in each kebele was divided by the number of households in the kebele to determine the proportion of individuals to be studied in each selected kebele. This allowed a systematic sampling technique to be used in order to select households.

### Eligibility criteria

**Inclusion criteria:** All adults in the households who were 25 years old and above who lives permanently (lived for at least six months) in the study area.

**Exclusion criteria:** Adults with known normal physiology like pregnancy, and gross anatomical deformities of the arms were excluded from the study.

### Data collection

Data were collected by interviewing eligible subjects using a structured questionnaire and physical measurements. The questionnaire was adapted from “WHO STEP wise approach to surveillance of non-communicable diseases (STEPS)” [11]. It was initially prepared in English. The English version was translated to the local language for better understanding by both data collectors and respondents. It was also back translated to English by another language expert to ensure consistency. Data collectors were six clinical nurses supervised by two supervisors holding B.Sc in health officer/nursing proficient in the local language. Training and practical demonstrations on interview techniques and measurement procedures were given to data collectors and supervisors for two consecutive days.

The questionnaire was pretested on 5% of the study participants found outside of the study area and modifications were made on the basis of the findings. After completing the interview, the participant's height, weight and fasting blood glucose were measured and recorded by interviewers. Weight was measured digital scales (SECA 813, Germany) were checked and adjusted nearest 0.1 kg between each measurement and Height was measured using a portable stadiometer (SECA Germany); participants stood in erect posture without shoes, and the results were recorded to the nearest 0.5 cm. Measures were taken two times, and the average was considered in the analysis. Blood pressure was measured twice in a sitting position using adult size digital BP apparatus (OMRON M6 Comfort, Taiwan) after the participant rested for at least five minutes and no smoking or caffeine 30 minutes before measurement and the averages of the two records were used for the computation of results. The second measurement was taken five-to-ten minutes after the first measurement.

### Data quality control

Before data collection, the data collectors and supervisors were trained for two days mainly on the objectives of the study, ethical conduct of research, and meaning of the questionnaire, basic techniques of interviewing and the use of the weight and height scales. Weighing scale was well-calibrated before measurement and a respondent was measured with light close. In taking height the respondent adult made to stand straight with his/her shoes off and head held erect. Blood pressure was measured by adult size digital BP apparatus. Every day after data collection, the meeting was held

to evaluate completeness of questionnaire to ascertain all questions were properly filled, and were corrected by principal investigator. Every day before field work; calibration of weighing scale was done and BP apparatus was checked for its functionality at the morning.

### Data analysis and management

The data were coded and entered in to Epi-Data version 3.1 statistical software, and analyses were performed using IBM SPSS software version 23. Binary logistical regression was used to identify risk factors for hypertension. Initially, possible risk factors were assessed using bivariate analyses; then we did the multivariable logistic regression model to control confounding factors, and statistical significance was accepted when the P-value < 0.05. The Hosmer-Lemeshow goodness-of-fit statistic was used to evaluate whether or not the assumptions necessary for the application of multiple logistic regression are met. Odds Ratios (OR) with 95% Confidence Intervals (CI) was computed.

### Variables

**Hypertension:** A subject was considered as hypertensive if the blood pressure  $\geq 140$  mmHg systolic and/or  $\geq 90$  mmHg diastolic after two measurements were taken; the average of the two was determined or self-reported use of drug treatment for hypertension irrespective of measured blood pressure. Isolated Diastolic Hypertension (IDH) having a (systolic blood pressure < 140 mmHg and diastolic blood pressure  $\geq 90$  mmHg) and Isolated Systolic Hypertension (ISH) having a (systolic blood pressure  $\geq 140$  mmHg and diastolic blood pressure < 90 mmHg) was also considered as hypertension [12].

**Body Mass Index (BMI):** Weight in kilogram divided by height in meters squared. BMI will be categorized as < 18.5 Kg/m<sup>2</sup> (underweight), 18.5-24.9 Kg/m<sup>2</sup> (normal), 25-29.9 Kg/m<sup>2</sup> (overweight),  $\geq 30$  Kg/m<sup>2</sup> (obese) [13].

**Excess alcohol intake:** Refers to 1 drink per day for women or 2 for men, drinking too much can lead to an excess alcohol intake. A standard alcoholic drink is the equivalent to one bottle (330 ml) of regular beer (with 4.5% ethanol), one glass (100 ml) of wine (10% ethanol) or one cup (40 ml) of distilled spirit or local ‘Araqe/Katikala’ (40% ethanol) or two glass (200 ml) ‘Tella’ (6% ethanol) or one and half glass (150 ml) of ‘Tadji’ with 8% ethanol [14].

**Current smoker:** These include those who are regular and occasional smokers [15]. **Dietary intake:** Consuming less than 4-5 servings of 1 medium fruits and 1 cup leafy vegetables per day, less than 2-3 serving of low fat dairy products per day, and more than 1-2 serving of animal fat (beef meat, egg, chicken, butter, etc.) and highly processed foods like burger, margarine, cookies, etc.) was considered as high calorie dietary intake or unhealthy diet [16].

**Wealth index:** Is a composite measure of a household's cumulative living standard.

**Physical activity:** Commonly refers to physical movement that will improve health. Physical activity data were collected using Global Physical Activity Questionnaire (GPAQ) and activity levels were calculated by using the cut-off points in the analysis guide. Accordingly, the subjects were categorized as having low physical activity (metabolic equivalent units (MET) < 600/week), moderate physical activity (MET in between 600-1200) and high physical activity level (MET above 1200).

**Sedentary behavior:** Was measured by asking about the time spent sitting (computer use, working, watching television, and reading) during a typical week [17]. Lastly, responses were dichotomized as < 3 hours/day and  $\geq 3$  hours/day.

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## RESULTS

### Socio-demographic and economic characteristics of respondents

A total of 578 adults with 98.5% response rate were included in this study. More than half 326 (56.4%) were females. In this study, 473 (81.8%) of the respondents were living in rural area. The mean age of the study

participants was 36.8 years  $\pm$  8.22 SD and two hundred fifty six (44.3%) of the study participants fell in the age group between 25 to 34 years. Majority 491 (84.9%) were married and about 468 (84.1%) were protestant Christians followed by orthodox Christians 87 (15.1%). Majority, 543 (93.9%) were from Woliata ethnic groups, and about 168 (29.1%) were house wife followed by farmer 136 (23.9%) (Table 1).

**Table 1:** Socio-demographic characteristics of the study participants in Humbo District, Southern Ethiopia, 2020.

Variable (n=576)	Category	Frequency	Percent (%)
Sex	Male	252	43.6
	Female	326	56.4
Age	25-34	256	44.3
	35-44	201	34.8
	45-55	94	16.3
	55-64	27	4.7
Residence	Urban	105	18.2
	Rural	473	81.8
Educational status	No formal education	181	31.3
	Grade 1-8	78	13.5
	Grade 9-12	187	32.4
	Diploma or degree and post graduate	132	22.8
Marital status	Married	491	84.9
	Single	80	13.8
	Divorced and widowed	7	1.2
Religion	Protestant	468	84.1
	Orthodox	87	15.1
	Other	5	0.9
Ethnicity	Wolaita	543	93.9
	Amahara	20	3.5
	Other*	15	2.6
Occupation	Governmental	74	12.8
	NGO	6	1
	Merchant	129	22.3
	Daily laborer	15	2.6
	Unemployed	8	1.4
	Farmer	136	23.5
	House wife	168	29.1
	Other**	42	7.3
Wealth index	Poor	192	33.2
	Medium	176	30.4
	Rich	210	36.3

**Note:** \* =Gurage, Hadya, Oromo, Gamo, Dawuro \*\*=Student, farmer, carpenter

## Prevalence of hypertension

The mean systolic and diastolic BP were 119.55 ( $\pm$  14.48 SD) and 78.6 mmHg ( $\pm$  8.6 SD) respectively. The overall prevalence of hypertension was

17.8% (95% CI: 14.7-21. Among all hypertensive people identified, 82 (79.6%) did not know they had hypertension (newly screened) (Table 2).

**Table 2:** Hypertension among study subjects in Humbo district, Southern Ethiopia, 2020.

Variable (n=578)	Category	Frequency	Percent (%)
Hypertension	Yes	103	17.8
	No	475	82.2
Hypertensive subjects know hypertension status (n=103)	Yes	21	20.4
	No	82	79.6

## Behavioral and dietary practices

The findings of this study indicated that 20 (3.5%) were smokers during the time of the survey and of these 7 (1.2%) smoke on a daily basis. Sixty (10.4%) of the respondents had a history of drinking alcohol at least once [18]. However, of these respondents 3 (10.7%) were drinking alcohol one to three days per month and 4 (14.3%) take alcohol on daily basis. The study found 88 (15.2%) of the study subjects were not walking or ride bicycle for at least 10 minutes per day. One hundred ninety four (33.5%) of the study

participants, use motor vehicle for transportation service to move from one to another place. Majority of 465 (80.4%) and 316 (54.7%) our study participants were not engaged in vigorous and moderate work respectively. Similarly, 571 (98.8%) and 553 (95.7%) participants reported that they were not engaged in vigorous and/or moderate sport respectively. One hundred one (17.5%) do their work by sitting more than three hours (Table 3).

**Table 3:** Life style among study subjects in Humbo district, Southern Ethiopia, 2020.

Variable (n=578)	Category	Frequency	Percent (%)
Smoking currently	Yes	20	3.5
	No	558	96.5
Smoking daily	Yes	7	1.2
	No	571	98.8
Ever used alcohol	Yes	30	55.2
	No	548	94.8
Frequency of alcohol use	Daily	4	14.3
	5-6 days per week	13	46.4
	1-4 days per week	6	21.4
	1-3 days per month	3	10.7
	<Once per month	2	7.1
Walk or use bicycle for at least 10 minutes	Yes	490	84.8
	No	88	15.2
Transportation use	Motor vehicle	194	33.5
	Foot and motor vehicle alternatively	384	66.5
Vigorous activity work	Yes	113	19.6
	No	465	80.4
Moderate intensity work	Yes	262	45.3
	No	316	54.7
Vigorous sports	Yes	7	1.2
	No	571	98.8
Moderate sports	Yes	25	4.3
	No	553	95.7
Sitting time in work	<3 hours	477	82.5

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≥ 3 hours	101	17.5
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Eighty nine (15.4%) of the respondents consume fatty meats at least once per week. Of these 80 (85.1%) eat more than two days per week. Seventy eight (13.5%) of the respondents took highly processed foods and of them 24 (58.5%) consume one to two days per week. Nearly one third 165 (65.1%) use egg products and of them, 51 (28.7%) consume more than two

days per week. Majority 490 (84.8%) use saturated oil for food preparation. Regarding fruit and vegetable consumption, 319 (55.2%) and 85 (14.7%) of the study participants consumed fruit and vegetables less than two days per week respectively (Table 4).

**Table 4:** Dietary factors among study subjects in Humbo district, Southern Ethiopia, 2020.

Variable (n=578)	Category	Frequency	Percent (%)
Fatty flesh meats consumption	Yes	89	15.4
	No	489	84.6
Fatty flesh meats/week	1-2 days	14	14.9
	>2 days	80	85.1
Processed food consumption	Yes	78	13.5
	No	500	86.5
Processed food consumption/week	1-2 days	24	58.5
	>2 days	17	41.5
Egg product consumption	Yes	165	28.5
	No	413	71.5
Egg product consumption days/week	1-2 days	127	71.3
	>2 days	51	28.7
Oil used for food preparation	Vegetable oil	85	14.7
	Saturated oil	490	84.8
	Others	3	0.5
Fruit consumption/week	0-2 days	319	55.2
	3-4 days	190	32.9
	5-7 days	69	11.9
Vegetable use/week	0-2 days	85	14.7
	3-4 days	330	57.1
	5-7 days	163	28.2

### Medical and genetic factors

Majority, 433 (74.9%) of the respondents said that there was nothing that makes them stressful. 13 (2.2%) of the study subjects were reported that they have diabetes mellitus. From all of female study subjects, nearly half 172 (29.8%) use hormonal contraceptive family planning method. Twenty one (3.6%) were informed by health professional at least once or more time

that they have hypertension. Of these, 17 (2.9%) were on anti-hypertensive treatment. Forty nine (8.5%) of the respondents have family history of hypertension. Findings of this study revealed that 7.1% of the participants suffered from systolic hypertension and 13.1% from diastolic pressure (Table 5).

**Table 5:** Medical and genetic factors among study subjects in Humbo district, Southern Ethiopia, 2020.

Variable (n=578)	Category	Frequency	Percent (%)
Has any thing that makes stressful	Yes	145	25.1
	No	433	74.9
Self-reported DM	Yes	13	2.2
	No	565	97.8
Ever told having HPN by health professional	Yes	21	3.6

	No	557	96.4
On treatment of HPN	Yes	17	2.9
	No	561	97.1
Hormonal contraceptive utilization	Yes	172	29.8
	No	506	70.2
Family history of HPN	Yes	49	8.5
	No	529	91.5
Family history of DM	Yes	42	7.3
	No	536	92.7

**Body Mass Index (BMI):** The mean BMI of respondents was 21.56 ( $\pm$  2.965 SD) kg/m<sup>2</sup>. One quarter (26.3%) of participants was overweight while 6.6% were obese.

### Risk factors associated with hypertension

Different factors were assessed for association with hypertension in bivariate analysis. Among these factors age, ethnicity, self-reported diabetes mellitus and family history of hypertension were factors associated with hypertension. Other factors such as marital status, monthly income, alcohol use, high calorie fatty meat consumption, low days of fruit and vegetable consumption, sitting time in work and overweight or obesity were risk factors associated with the outcome variable. After adjusting for a number of covariates, multivariable logistic regression analysis showed that age, alcohol consumption, physical activity, family history of hypertension and being overweight or obese were significantly associated risk factors with

hypertension. Prior to reporting AOR for these covariates, multivariable logistic regression tested for model fit and ensured as fit well (Hosmer and Lemeshew p-value of 0.22). The likelihood of developing hypertension increased with advancing age. Study subjects aged 55-64 years were 2.88 times (AOR=2.880, 95% CI: 1.133, 7.321) more likely to develop hypertension as compared to those aged 25-34 years old. Participants with family history of hypertension were 3 times (AOR=3.145 (1.601, 6.176)) more likely to be hypertensive compared to their counterparts. The odds of developing hypertension among respondents who had ever consumed an alcohol drink was nine-times more likely compared to the counterparts who had never consumed alcohol (AOR=8.8, 95% CI: 3.000, 26.101). Being obese was 2 times (AOR=2.343, 95% CI: 1.016, 5.401) more likely to develop hypertension compared to BMI<25 Kg/m<sup>2</sup> study subjects. Risky behaviors like smoking were not significantly associated with hypertension in this particular study (Table 6).

**Table 6:** Bivariate and multivariable logistic regression analysis of factors associated with Hypertension among adults 25-64 years in Humbo district, Southern, Ethiopia, 2020.

Variable	Category	Hypertension		Crude or (95% CI)	Adjusted or (95% CI)
		Yes N (%)	No N (%)		
Age category	25-34	32 (31.1)	224 (47.2)	1	1
	35-44	42 (40.8)	159 (33.5)	1.822 (1.108, 2.996)*	1.887 (1.11, 3.21)*
	45-54	20 (19.4)	74 (15.6)	1.803 (0.942, 3.451)	1.375 (0.67, 2.80)
	55-64	9 (8.7)	18 (3.8)	3.111 (1.250, 7.740)*	2.880 (1.13, 7.32)*
	Single	9 (8.7)	71 (14.9)	1	1
Marital status	Married	92 (89.3)	399 (84.0)	0.259 (0.092, 0.728)	0.107 (0.02, 0.436)
	Widowed and separated	2 (1.9)	5 (1.1)	1.068 (0.118, 9.668)	0.493 (0.02, 10.98)
Ethnicity	Wolaita	92 (89.3)	451 (94.9)	1	1
	Amhara	3 (2.9)	7 (3.6)	0.865 (0.248, 3.012)	1.164 (0.301, 4.50)
	Others	8 (7.8)	7 (1.5)	5.602 (1.982, 15.833)	2.852 (0.873, 9.31)
Wealth index	Poor	25 (24.3)	167 (35.2)	1	1
	Medium	23 (22.3)	153 (32.2)	0.830 (0.439, 1.566)	1.007 (0.536, 1.89)
	Rich	55 (53.4)	155 (32.6)	2.37 (1.517, 4.261)*	1.733 (0.968, 3.10)
Alcohol use	Yes	18 (17.5)	12 (2.5)	8.17 (4.18, 20.15)***	8.84 (3.00, 26.10) **
	No	85 (82.5)	463 (97.5)	1	1
Fatty Flesh Meats intake	Yes	28 (27.2)	61 (12.8)	0.395 (0.237, 0.658)	0.405 (0.232, 0.707)
	No	75 (72.8)	414 (87.2)	1	1

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Days fruits consumed per week	0-2 days	49 (47.6)	270 (56.8)	0.490 (0.263, 0.910)	0.588 (0.295, 1.173)
	3-4 days	36 (35.0)	154 (32.4)	0.662 (0.346, 1.267)	0.710 (0.363, 1.390)
	5-7 days	18 (17.5)	51 (10.7)	1	1
	0-2 days	17 (16.5)	68 (14.3)	0.851 (0.446, 1.624)	0.905 (0.439, 1.866)
Vegetable use/week	3-4 days	49 (47.6)	281 (59.2)	0.566 (0.350, 0.913)	0.735 (0.430, 1.255)
	5-7 days	37 (35.9)	126 (26.5)	1	1
Sitting time in work	<3 hours	79 (76.7)	398 (83.8)	1	1
	≥ 3 hours	24 (23.3)	77 (16.2)	1.322 (0.786, 2.223)	1.092 (0.556, 2.143)
Family history of hypertension	Yes	16 (15.5)	33 (6.9)	2.83 (1.50, 5.34) ***	3.145 (1.60, 6.17) ***
	No	87 (84.5)	442 (93.1)	1	1
	Underweight /normal	55 (53.4)	333 (70.1)	1	1
BMI of respondents	Overweight	37 (35.9)	115 (24.2)	1.913 (1.200, 3.05) **	2.189 (1.309, 3.66) **
	Obese	11 (10.7)	27 (5.7)	2.202 (1.011, 4.799) *	2.343 (1.016, 5.401) *

**Note:** \*p-value< 0.05, \*\*p-value<0.01, \*\*\*p-value<0.001, \*Others Gamo, Gurage

### DISCUSSION

This study aimed to determine prevalence and risk factors associated with hypertension among adults in Humbo district. The overall prevalence of hypertension 17.8%. Family history of hypertension, age, alcohol use and BMI were independent risk factors of hypertension identified. The result of current study on the prevalence of hypertension was comparable with a community-based study conducted in Sidama Zone, Ethiopia (18.8%) and Nigeria (16%). Prevalence of hypertension in this study was lower than a community-based study studies done in Gondar 28.2% and 30.3% in Addis Ababa. This dissimilarity could be explained in two ways; this study considered urban and rural settings whereas the former studies included only urban. And the other reason for the dissimilarity might be the age difference in the study population (25-64 age category were included in this study while other studies included adult population aged 15-90 years).

Age was identified as a factor for hypertension in this study and many other studies. This could be due to the physiological change of blood vessels as the age increased; in which blood vessels flexibility might be lost (hardening of the arteries) as age increased. Alcohol consumption was significantly associated with hypertension in this study. The alcohol consumption was a risk factor for hypertension in studies conducted in Finland and present study. Moreover, BMI was statistically associated with hypertension, with the odds of hypertension being more two times higher among respondents who were overweight and obese as compared to respondents whose BMI was less than 18.5. This finding is in accordance with other similar studies, where higher BMI was associated with hypertension. Those who had family history of hypertension were three times more likely to be hypertensive. This result is in agreement with findings of some other studies in Northwest Ethiopia and Southwest Ethiopia. The possible reasons might be participants with family history of hypertension might have the same genetic components, and the fact that family tend to share the same lifestyle choices and behavior. This finding did not show any association of hypertension with marital status, education level, wealth index, dietary habits, or sedentary behaviour like that of many other study reports. This could be explained by difference in study population, setting, sample size, socio economic and cultural difference between the two studies.

### CONCLUSION

Nearly one out of six-adults developed hypertension in this population. This shows that there was high prevalence of hypertension among adults in Humbo district and may show a hidden epidemic in this population. In

conclusion this study provides evidence on the prevalence of hypertension and its associated risk factors in Humbo among 25-64 years adults population. The analytic component of the study indicated that family history of hypertension, age, alcohol use, being obese were independent risk factors of hypertension. Extensive health education on cardiovascular risk reduction should be done by promoting healthy life style and motivating the community for adequate BP control. In addition, preventive measures of hypertension need to incorporate stopping Alcohol use and reducing overweight and promoting fruit and/or vegetable consumption.

### ETHICAL CONSIDERATION

The ethical clearance was obtained from the ethical review committee of the college of health sciences and medicine, Wolaita Sodo university. The official letter of cooperation was written to Wolaita zone health department and Humbo town health office for permission. Permission letter was obtained from Humbo town administration health office for each kebele. The nature of the study was fully explained to the study participants and informed verbal and written consent were obtained from each respondent before the interview. They were told that documents would be kept confidential and that they had the right to refuse to participate totally at any time if they were not comfortable. Subjects who had high BP during data collection were counseled and advised to go to a health institution as soon as possible

### ACKNOWLEDGMENT

We are grateful to the Wolaita Sodo university, school of public health, and college of medicine and health sciences for facilitating to collect data and for providing ethical clearance respectively. Our appreciation also goes to our data collectors, supervisors, and the study participants.

### COMPETING INTERESTS

The authors have declared that no competing interests exist.

### FUNDING

This work was funded by Wolaita Sodo university. The sponsors of this study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to the data in the study and had full responsibility for the decision to submit.

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