



COLLEGE OF MEDICINE AND HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH

**Uncontrolled hypertension And Associated Factors Among Adult
Hypertensive Patients Attending on Follow up At Public Health
Facilities Hawassa City Administration Hawassa, Sidama Region
Ethiopia,**

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HAWASSA, ETHIOPIA

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Hawassa City Administration Hawassa, Sidama Region Ethiopia

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DECLARATION

I declare that this master of public health infield epidemiology thesis entitled “UncontrolledHypertensionAndAssociatedFactorsAmongadulthypertensive patients attending on follow-Up at Hawassa City Administration Public Health Facility Sidama Region Ethiopia” submitted to School of Public Health is my original work and all sources of materials used for this thesis have been duly acknowledged.

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Next our and resident advisor Mr Mesfin Melese, **Finally**, I would like to say thanks my darling families

Abstract

Background: Uncontrolled hypertension refers to systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg, even when patients are on anti-hypertension medication. Repeatedly unrecognized risk factor that contributes to putting many people into various complex health problems. It can lead to kidney, heart disease, brain, and other diseases, and sudden death.

Objective: To assess the magnitude of uncontrolled hypertension and associated factors among adult hypertensive patients attending in follow-up at public health facilities in Hawassa city administration

Methods: A cross-sectional study was carried out, from March to April 2024 including 411 hypertensive patients older than 18 years. The study was carried out at public health facilities at Adare General Hospital, Motiti Fura Primary Hospital Millennium Health Centre, Alamura Health Centre in the chronic follow up unit in the Hawassa city administration. Data were collected through patient interviews and patients' medication record reviews. Descriptive statistics, bivariable and multivariable logistic regression were used to assess the association between independent and dependent variables. The output of the analysis is presented using adjusted odds ratio with 95% confidence interval.

Result: Out of the 422 hypertension patients who were selected, the study's direct participants, 411 of whom had a 2.6% refusal rate ($n = 11$), The prevalence of uncontrolled hypertension was 55.7% ($n = 229$) 95% CI= CI = 50.8–60.6) in the study were in the age group of <60 years 57.9% ($n=238$) After adjusting for other determinants, age, ≥ 60 years (AOR=3.287 95% CI: 2.043-5.288). diet-nonadherence (AOR=2.95, 95% CI: 1.592-5.475) physical activity (AOR=1.803 95% CI: 1.079-3.014).and co-morbidity (AOR = 2.737, 95% CI: 1.612-4.647) are found to be statistically significant predictors of uncontrolled hypertension

Conclusions and recommendation: There were, Age, diet non adherence, nonphysical exercise adherence and co-morbidity, which are independently predicted. Advise patients to follow suggestions for lifestyle adjustments to improve hypertension self-management.

Keywords: Raised blood pressure uncontrolled hypertension, Sidama Region, Ethiopia,

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Acronyms

AOD	Adjusted odd ratio
BP	Blood Pressure
BMI	Body mass index
CKD	Chronic Kidney Disease
CI	Confidence interval
CVD	Cardiovascular Disease
DBP	Diastolic Blood Pressure
HEARTS	Healthy lifestyle Evidence based treatment protocols Access to essential medicines and technology Risk based management Team care and task-sharing Systems for monitoring
HTN	Hypertension
HIC	High income countries
LMIC	Low- and middle-income countries
NCD	Non-Communicable Disease
OR	Odds ratio
PR	Prevalence Ratio
SBP	Systolic Blood Pressure
SSA	Sub-Saharan Africa
UHTN	Uncontrolled Hypertension

1. Introduction

1.1. Background

Hypertension is a condition where the systolic blood pressure (SBP) is greater than or equal to 140 mm Hg and the diastolic blood pressure (DBP) is greater than or equal to 90 mm Hg.[1]. Hypertension is mainly categorized as primary or secondary based on its cause. Primary or essential hypertension is defined as the absence of an identified cause. The majority (95%) of hypertensive patients fall into this classification [2]. However, uncontrolled hypertension (UHTN) refers to SBP \geq 140 mmHg and DBP \geq 90 mmHg, even when patients are on anti-hypertension medication [3]. The risks of developing kidney, heart disease, brain, and other diseases are dramatically increased by this dangerous medical condition[4].

The primary causes of this increase include the aging population, low physical activity, unhealthy behaviours (poor physical activity, more time sedentary behaviours, unhealthy diets, obesity, smoking status, and alcohol misuse) as well as disparities in access to high-quality care low [5].

Worldwide more than 1 billion people live with hypertension[6]. Most people with high blood pressure, 82% lived in low-income and middle-income countries (LMIC) [4]. Each year worldwide, 45% of deaths are due to heart disease and 51% of deaths due to stroke cause by hypertension [2].

In recent years, hypertension and CVDs have increased in Africa almost three-quarters of people with hypertension (639 million people) live in developing countries. Even more limited health resources and where people have a very low awareness of hypertension and poor BP control [7].

Poor hyper-tension control are important factors in the rising epidemic of cardiovascular disease in developing countries[7].The highest rates of uncontrolled blood pressure are seen in Africa, one of the world most populous continent [8]. Uncontrolled hypertension only few studies were done in Ethiopia. on its magnitude and factors showed that hypertension is the leading cause of cardiovascular diseases such as stroke and ischemic heart diseases across the studies, Ethiopia had accumulative prevalence of 48% uncontrolled hypertension[1].

Raised blood pressure is both preventable and treatable the risk of developing high blood pressure can be controlled by lifestyle changes, reducing salt intake, pause unhealthy diet, avoiding harmful use of alcohol, getting regular exercise and avoiding tobacco use.

For many people lifestyle changes are appropriate to control BP. In addition adherence to these treatment helps thorough going benefit in controlling BP because failure hinders control of high blood pressure [9]. Other risks that lead to raised blood pressure are aging[10]. Obesity, Diabetes mellitus, High blood cholesterol, Comorbidity, Family history of hypertension and poor access to health services due to low socioeconomic status that increases the vulnerability [11]. It will have a major negative economic and societal impact to ignore HTN [12].

In general, in lower-and middle-income countries including Ethiopia, the burden of diseases has been arrived critically while self-care helps ensure regular intake of medication[12]. Healthy behaviours and better enriching a healthy lifestyle to maintain self-reliance, more ever the governments and stakeholders should design an appropriate strategy to prevent and control the high blood pressure of disease in the Ethiopian population.

The current study although there is research on uncontrolled blood pressure and related factors it is not enough and it aims to identify the gap related to people's physical activities and diet and prevent uncontrolled blood pressure based on research, people are suffering from disability and death, and the problem is increasing.

The reason for this is not really known, especially when it comes to exercise, including a healthy diet consequently thus, this study aimed to determine the dominance of uncontrolled hypertension and assess the factors associated with poor hypertension control in Hawassa city administration public health facilities Sidama region.

1.2. Statement of the problem

Uncontrolled high blood pressure has become a public health challenge, causing more morbidity and mortality than communicable diseases. About 1.39 billion adults in the world have HTN and the amount is expected to increase as a result of different factors including urbanization especially in low and middle-income countries.[13] when we look at the burden of the disease and controlled on different countries worldwide the existing scientific study shows Europe BP control rate among those treated reached 40% in England 30%, in Germany 28%. in Italy 19%, in Spain and 21% in Sweden, Similarly, the estimated prevalence of hypertension in France is 31% and 51.3% of hypertensive treated patients are not controlled[14].

As well the African region still bears on very high disease prevalence, with poor rates of detection, treatment and control as the leading cause of death globally accounting for over 10 million deaths per year hypertension is an unfortunate emerging public health burden in SSA and represents a looming crisis of over 1.39 billion adults worldwide with hypertension in 2010 almost three times more individuals resided in LMIC vs. HIC regions (1.04 billion in LMIC and 349 million in HIC) [15].

The same as Low and middle-income nations including Ethiopia are disproportionately affected by the issue of uncontrolled hypertension. [16]. Even in Ethiopia, elevated blood pressure is seen in 19.6% to 30.2% of the population. in the same manner as uncontrolled hypertension across the 13 trials the total prevalence of uncontrolled hypertension was 48% [1]. Uncontrolled hypertension has made heart disease and stroke the primary causes of death and disability[17]. In younger people and two-thirds of people with HTN live in economically developing countries diseases related to BP have a greater impact on healthcare expenditure and raised BP and its complications cost an estimated 10% of healthcare spending [8].

The predominance of uncontrolled hypertension in Ethiopia is rising due to increased risk factors [18]. Evidence had shown that age, sex, non-adherence to antihypertensive medications, low non adherence, salt intake, and insufficient physical activities, the number of medications and presence of comorbid disease are among the major contributing factors to uncontrolled hypertension. Among hypertensive patients, identifying these determinant factors are important to reduce uncontrolled hypertension [13]. When we look at the situation of uncontrolled hypertension disease in our country

from few studies that was done, uncontrolled hypertension is the leading cause of cardiovascular diseases such as stroke and ischemic heart diseases, death and illness due to hypertension act as key barriers to sustainable development.

The impact of hypertension on working-age adults has an indirect influence on national income through lower productivity and fewer hours worked, in addition to the primary effect of poor health on household living standards due to out-of-pocket expenses. In order to minimize the impact of the disease it is better to do physical exercise, this exercise significantly reduced 24-hour DBP of 3,0 mm Hg and SBP of 5.1 mm Hg [19].

Although the application of hypertension preventive and control measures promotes a healthy life and feasible growth, responsible entities give it less emphasis, and the state of hypertension control is still inadequate. Furthermore, the research field has little data on uncontrolled hypertension and its contributing variables, even though uncontrolled hypertension has been studied in various studies, the problem is increasing, in addition to this, many people are suffering from disability and death.

Meanwhile the reason especially, physical activities, including a healthy diet are not properly identified and if there are additional reasons it is necessary to do the necessary prevention and controlled. Thus, this study aimed to determine the dominance of uncontrolled hypertension and assess the factors associated with poor hypertension control in Hawassa city administration public health facilities Sidama region.

Uncontrolled hypertension is not only becoming a public health problem, but also a complex health challenge. Therefore, the size and scope in society, identifying associated factors, to maintain a healthy and balanced lifestyle [8].

By changing the lifestyle, more than ever before, to take proper precautions against the co-causes of uncontrolled high blood pressure, to prevent and avoid the risk of sudden death and horrible a serious health problem.

As (World Heart Vision 2030) major modifiable risk factors contributing to the development of cardiovascular disease and complications [20]. They can be easily adjusted to make it easier to implement[21].

Using the HEART Strategic plan, you can control the blood to prevent hypertension, that is from heart failure, from stroke to protect oneself from the disease and not to be vulnerable.

Based on the results of the study by devising an appropriate actionable plan and policy direction by activating the society and making it practical, we will design the activities that can be implemented every year, so that it can be a starting point to prevent the risk of uncontrolled high blood pressure.

1.3. Significance of the study

Uncontrolled hypertension is not only becoming a public health problem, but also a complex health challenge. Therefore, the size and scope of Uncontrolled hypertension in society, identifying associated factors to maintain a healthy and balanced lifestyle [8].

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1.4. Literature Review

1.4.1. Magnitude of Uncontrolled hypertension

Worldwide more than 1 billion people live with hypertension[6]. Most people with high blood pressure 82% lived in low income and middle-income countries (LMIC)[4]. A study reported worldwide cross-sectional analysis was conducted unhealthy behaviours and risk of uncontrolled hypertension among treated individuals-the Constances population-based study uncontrolled hypertension was more prevalent in men than in women (62.9% vs 47.9%) respectively [14].

Another study done on uncontrolled hypertension indicated that the prevalence of in Chinese 43.5% were uncontrolled hypertensive [22]. In that study the prevalence of UHNT in South Africa, achieving the blood pressure treatment target in individuals with hypertension is a serious global health challenge. The actual burden of uncontrolled hypertension is poorly understood especially in the developing countries. The majority of the participants were 55 years old and above (69.0%) Zulus (81.2%) non-smokers (84.19%) and had been diagnosed with hypertension for more than a year prior to the study (72.64%).

The overall prevalence of uncontrolled hypertension was 56.83% [23]. Another study done on a systematic review and meta-analysis study reported in sub-Saharan Africa. The combined prevalence of uncontrolled hypertension among patients with comorbidities was 78.6% [8]. A study conducted in Kenya the study adopted a cross-sectional study design and a mixed-methods approach were reported: 48% had uncontrolled hypertension. [16].

Insufficient studies have been undertaken in Ethiopia on prevalence of UHTN with discrepancies like study area, study population and study two studies conducted hospital based cross-sectional study in prevalence of uncontrolled hypertension was found 52.5% [18] 56.2% [6].

As study reported a community based in Addis Ababa 29.24% were hypertensive prevalence[24]. Study done on systematic review and meta-analysis of institution-based observational studies in Ethiopia as reported the combined prevalence of uncontrolled hypertension in Ethiopia was 48% [[25].

1.4.2. Risk factors of uncontrolled hypertension

Underlying risk factors leading to uncontrolled hypertension can help to explain why some populations are at a greater risk of developing uncontrolled hypertension than are others.

Several hypertension risk factors seem to be more common in developing countries than in developed countries[7].

A number of multi-factors contribute to uncontrolled blood pressure and make the management of hypertension more problematic.

A great deal of research findings reveal that uncontrolled hypertension is mainly related to socio-demographic, unhealthy behaviours or lifestyles (unhealthy behaviours were considered as heavy alcohol consumption, low or medium adherence to dietary recommendations, sedentary physical activity level and overweight 56.1% had uncontrolled hypertension) [14] source of financing for hypertensive drugs [16]. Comorbidity lack of hypertension related complication family factors [26].

1.4.3. Socio-demographic

Age is one of the factors reported by different studies to be associated with the control of blood pressure the chance of HT was 8.6-fold higher in the oldest vs the youngest age group [27]. Many studies revealed advanced age is an independent predictor of uncontrolled hypertension [10].

Another study done on older age group moreover, near to complication of UHTN [28] similar study done on among adult hypertensive patients on follow-up at Northern Ethiopia age ≥ 50 years old under factors are strongly linked to uncontrolled hypertension as cross-sectional study [29]. Another study done on a marital partner with hypertension, females and males were likely to be in control of their hypertension if their partner also had controlled hypertension [30]. Another study on socio-behavioural factors like family income, educational attainment, and occupational status had their blood pressure under controlled this value was 56.3% [31].

Study done in China primary educational level (49.6%) or unemployed and retired (49.5%) or lower annual household income level (44.9%). Socioeconomic status played an important role in hypertension prevalence and hypertension control among adults in Nanjing, China [32].

Study done in different countries in Kenya and Uganda a randomized controlled linkage to care within hypertension control at 90 days was 51% intervention and 41% control high transportation costs, long distances from clinic, opportunity costs associated with missed work and medication costs may all contribute to low rates of linkage to care [11].

1.4.4. Behavioral factor

The study was carried out in Addis Ababa, Ethiopia. lifestyle and behavioural factors are strongly linked to uncontrolled hypertension. who use salt, smoke, or drink alcohol [1] Another study were conducted Uttarakh and highlighted significant mean difference was found between knowledge of raised blood pressure with the amount of consumption of fruits, green leafy vegetables, a non-vegetarian diet and a well-balanced diet [33].

Another study done on people living with HIV/AIDS who show known behaviours(physically inactive and stress)that place them at risk for hypertension is high [34]. Another study conducted on among patients attending hypertension clinics in Mbarara city, South Western Uganda were indicated patients with hypertension were physically inactive and sedentary an increase in hypertension and its adverse outcomes[35].

1.4.5. Individual Factor

Study done in uMgungundlovu, KwaZulu-Natal, South Africa the prevalence of hypertension was 44.4% were aware of their diagnosis, educational attainment was negatively associated with hypertension prevalence and positively associated with its control[36].

1.4.6. Disease history

study done at Clinics in Improving Control of Hypertension and Diabetes Among Adults residing in rural Ballabgarh, Haryana 40.2% had diabetes the control rates at were 37.1% male sex, and raised SBP[37]. Another study done hospital-based unmatched case-control study was conducted in Kembata Tambaro Zone, South Nations Nationalities and Peoples Region, Ethiopia 2021and patients who had poor knowledge on diabetes were more likely to develop hypertension among diabetic patients[2] .

1.4.7. Clinical and medication related

Study reported in Nigeria antihypertensive medication non-adherence 87.1% were non-adherent to antihypertensive medication[38]. Another study done, a cross-sectional study

in primary healthcare centers in Taif city About 86% patients showed a high level of adherence[12]. Another study were conducted in Addis Ababa, Ethiopia obesity, abdominal obesity very high association hypertension among adults[39].

1.4.8. Conceptual Frame

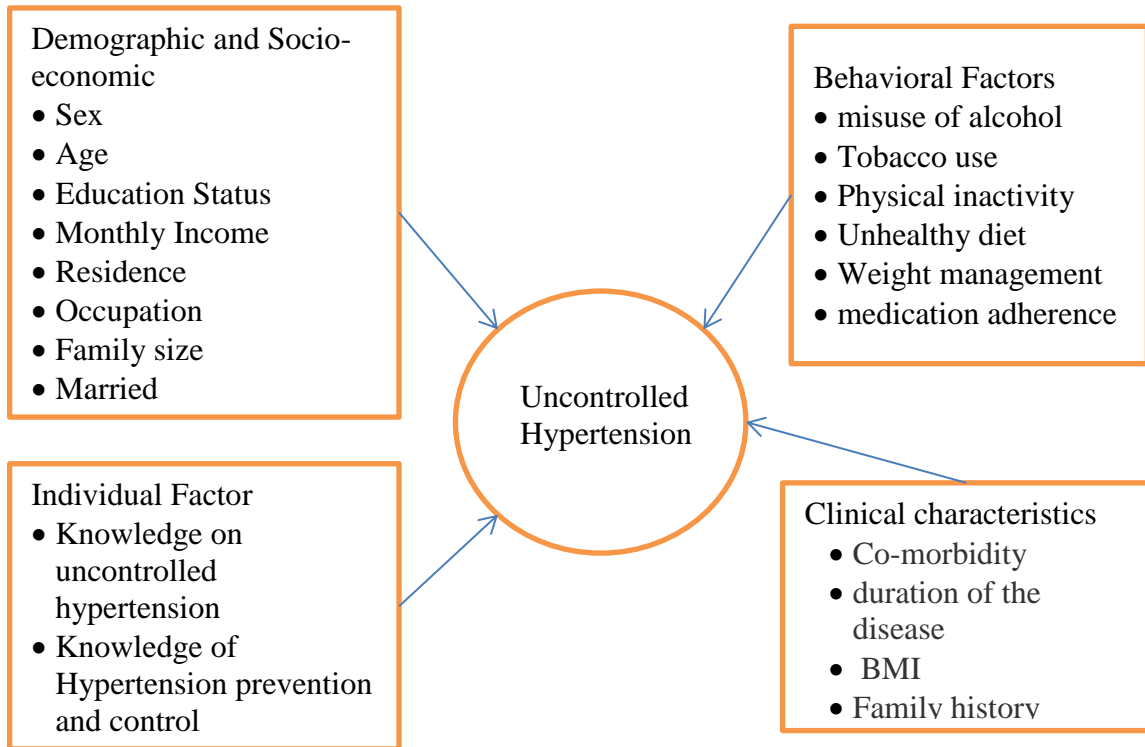


Figure 1: Conceptual Frame Work

Conceptual Frame work for uncontrolled hypertension and associated factors among adult hypertensive patients in follow-up at Hawassa city administration public health facility, Sidama Region Ethiopia.[Source: Adapted from WHO.[40] .

2. Objective

2.1. General Objective

- ❖ To assess the magnitude of uncontrolled hypertension and associated factors among adult hypertensive patients in follow-up public health facilities in Hawassa city administration 2024.

2.2. Specific objectives

- ❖ To determine the magnitude of uncontrolled hypertension among adult hypertensives on follow-up.
- ❖ To identify factors associated with uncontrolled hypertension among adult hypertensives on follow-up

3. Methods and Materials

3.1. Study setting

The study was conducted in Hawassa city administration, Sidama region. It has seven sub city administrations and 22 kebeles. It also has four government hospitals including Hawassa University Teaching Referral Hospital and five urban and six rural kebeles, as well as governmental the hospital also provides a follow up special unit. health centre are also the first contact points for those on medication at chronic follow-up units in hypertension screening, detection, and management. The study was carried out at public health facilities Adare General Hospital, Motiti Fura Primary Hospital Millennium Health Centre, Alamura Health Centre, estimated total population of 409,810. Many diversities nation nationality live together.

3.2. Study design and period

A facility based cross sectional study was conducted from March to April 2024

3.3. Population

3.3.1. Source population

Each and every person visiting a medical facility for a diagnosis of hypertension or attending in the chronic follow-up unit. hypertension diagnosis who is at least eighteen years old.

3.3.2. Study population

Randomly selected, hypertensive patients who have been under permanent care for at least six months attending in the chronic follow-up unit.

3.3.3. Inclusion and exclusion criteria

Inclusion

All age ≥ 18 years with hypertension cases were preselected with a criterion of at least one elevated BP measurement identified by clinic-based more than six months attending on

Exclusion

Those who renal transplants, pregnant women, hypertensive patients with serious illnesses, who were mentally ill and disabled (unable to communicate) were not permitted.

3.3. Sample size determination

In this study, sample sizes were determined using a single population formula. taking prevalence of uncontrolled hypertension 52.1% of from the study carried out in Addis Ababa Ethiopia[4] by using this prevalence to obtain the maximum sample size with 95% certainty and margin of error of $\pm 5\%$ between the sample and the underlying population.

The sample size is calculated by using the single population formula. Where:

P = proportion of people with hypertension and (it is taken from previous study as 52.1%).

d = degree of precision (assumed to be $\pm 5\%$)

$z_{\frac{\alpha}{2}}$ = denotes the value of standard normal variable that corresponds to be 95% confidence levels (1.96) $n = Z_{\alpha/2}^2 * p * (1-p) / d^2$

$$n = (1.96)^2 * (0.52) * (1-0.521) / 0.05^2$$

$$n = 384$$

Table 1: Sample size calculation

Variables	Prevalence	Power	Confidence interval	AOR	Sample size	Including 10%	Reference
non-adherence to alcohol abstinence	52.5	80	95	2.09	270	297	[18]
co-non-adherence to medication morbidity	48	80	95	1.83	378	416	[4]
non-adherence to low-salt diet	48.6	80	95	1.98	302	332	[29]
Lack of awareness of hypertension-related complications,	56.7	80	95	2.04	300	330	[9]

Accordingly, after considering non-respondent rates of 10%, the final sample size of the study was 422 that is computed based on the assumption of the single population proportion formula since this provided the larger sample size.

3.4. Sampling procedure and techniques

Facilities selected by randomly (namely Adare General Hospital, Motiti Fura Primary Hospital Millennium Health Centre, Alamura Health Centre) participants was selected proportional allotted to the allocation study units based upon the number of hypertensive patient flow in the selected health facilities and the calculated sample size was distributed in accordance with this (Fig. 2).

To determine the required number of participants from each hospital, calculated the k-value by dividing the total number of hypertensive patients in the four hospitals by the calculated sample size. Thus, the calculated k-value becomes two the index participant was then chosen at random from 2 in each health facilities. accordingly, every second participant was chosen using a systematic sampling was used to select 422 study

participants with hypertension who were on treatment for at least 6 months. The first case is selected by lottery method within the sampling interval then using the interval, the rest of the cases was selected. Registration numbers of the patients who were on follow-up and eligible was taken.

Facilities selected by randomly (namely Adare General Hospital, Motiti Fura Primary Hospital Millennium Health Centre, Alamura Health Centre)

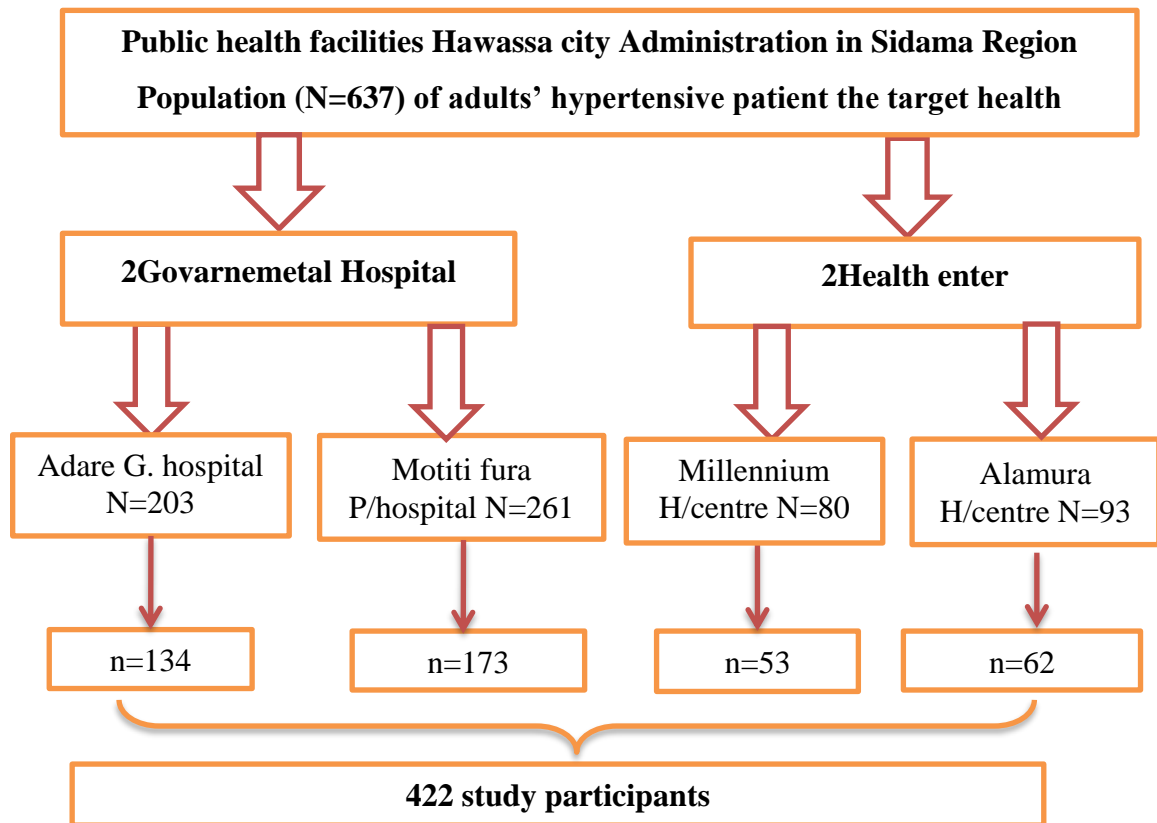


Figure 2: Schematic presentation of sampling procedure (sours Hawassa city administration health office HMIS)

Figure 2 indicates schematic presentation of sampling procedure on uncontrolled hypertension and associated factors among adult hypertensive patients in follow-up at Hawassa city administration public health facility, Sidama Region Ethiopia, 2024

3.5. Data Collection Tool

Five BSc data collectors and two BSc supervisors were recruited and trained for one day regarding orienting The data is collected using a structured interview administered questionnaire, which was prepared to address all the important variables (sociodemographic characteristics lifestyle behaviors, physical activity, dietary patterns cigarette smoking status and alcohol use, Individual factor and Clinical characteristics)

plus, questions about family history of hypertension supportive document review using patients' chart (client medical records relevant data and antihypertensive medications) after obtaining an informed consent while exiting from their clinical care.

3.6. Data Quality Control

Monitor all collected data were evaluated for correctness, consistency, integrity, and clearness by the principal investigator on a daily basis. to ensure the quality of the data, tool was pretested. Adjusted pre-test 5% the validated and standardized questionnaire were prepared by English language then translated to Amharic versions in order not to see the response of one another, the study participants were asked in private room. additionally, the data completeness and the overall data collection process is closely supervised by the supervisors and investigators.

3.7. Study Variables

Dependent variable

- ❖ uncontrolled hypertension

Independent variables

Demographic and socioeconomic factors, (age, sex, education status, monthly income, residence, occupation and family size). Behavioural factors, (harmful use of alcohol, tobacco use, physical adherence, unhealthy diet, weight management) and medication adherence. of hypertension prevention and control, BMI, disease history, family history of hypertension, clinical and medication related and comorbidity, individual factor, (lack of knowledge hypertension awareness and knowledge).

3.8. Operational definitions

Uncontrolled hypertension: is BP \geq 140/90 mmHg using digital sphygmomanometer for adult hypertensive clients without diabetes mellitus and chronic kidney disease for at least three consecutive follow-up measurements and blood pressure \geq 130/80 mmHg using digital sphygmomanometer for adult hypertensive clients with diabetes mellitus and chronic kidney disease for at least three consecutive follow-up measurements[22].

Medication Adherence a patient with Amo risky Medication Adherence Scale (MMMAS)score of \geq 6[41].

Healthy Diet, healthy diet generally includes a combination of vegetables, fruit, whole grains: and. lean protein: high in protein and relatively low in fat, lean proteins include grilled chicken, ground turkey, and white fish. healthy fats encompass in meals

Lifestyles: Life styles encompass physical activity patterns that range from moderate to intense physical activity and dietary habits such as consuming fruits, fresh vegetables, dairy products, eggs, and dining out. [42]

Physical activity: was assessed by 2 items. How many of the past 7 days did you do at least 30 minutes total physical activity? and how many of the past 7 days did you do a specific exercise activity (such as swimming, walking or biking) other than what you do around the house or as part of your work? responses were summed (range, 0-14). participants who scored ≥ 8 were coded as adhering to physical activity recommendations

Body Mass Index: was calculated as weight in kilograms divided by height in square meters and interpreted as underweight (BMI<18.5) low weight, health weight 18.5-24.9. overweight 25.0-29.9 and above ≥ 30 obese.

Family size: is the number of family members who live in a common shelter and are feeding from the same table together.

Income; It is periodical monthly earning from one's business, lands, work, investment in Ethiopian Birr

3.9. Data Processing and Analysis

Collected data were checked, cleaned and entered into Epi-info version 7.20 and then was exported into Statistical package for the social sciences version 27 for analysis. descriptive and analytic inferential statistics was performed. Descriptive data was displayed by using table and also was narrated too. Regarding the identification of risk factors, simple binary logistic regression and multi variable logistic regression analysis was done. Factors whose p-value becomes below 0.25 during bivariate logistic regression analysis were considered as a candidate variable for multivariable logistic regression analysis. For the model fitness, the p-value of the Hosmer and Lem show test was used and its value became greater than 0.05

A p-value of less than 0.05 in multi variable logistic regression analysis were considered as statistically significant. Adjusted odds ratio (AOR) with its 95% confidence interval (CI) were used to measure the strength of association Finally presented.

3.10. Ethical consideration

Ethical clearance was obtained from the Institute of Review Board of Hawassa University. The support letter to selected health facility in Hawassa city administration are given from Scholl of Public Health of Hawassa University, after we get permission from selected health facility in Hawassa city administration detailed discussion with be held NCD case team leader about the objectives of the study. The rights of the participants during data collection are clearly discussed before going to study subjects. After being agreed with NCD case team leader verbal informed consent was obtained from each study participants; the overall objectives of the study, privacy and confidentiality issues and the right to refuse at any time during giving the data was clearly informed before going to data collection. Study participants is kept to in privacy rooms in order to keep their confidentiality. Collected data is stored and handled carefully in a separate room in order not to be transferred to third party.

4. Result

4.1. The socio-demographic characteristics of participants

Out of the 422 hypertension patients who were selected for the study, 411 of the study's direct participants showed a refusal rate of 2.6% (n = 11) and declined to participate in the study on hypertension. The mean age of the respondents was 55.78 (SD ± 12.5 years, with a minimum age of 28 years and a maximum age of 82 years. In our study of these the majority of participants were female: 217 (52.8%) and male: 194 (47.2%). Most of the participants were in the age group of <60 years, 238 (57.9%) were family size, and others, as shown in Table 2 below, show the socio-demographic characteristics of participants of hypertensive patients attending chronic follow-up unit's governmental hospitals in Hawassa City Administration 2024 (n = 411).

Table 2: Socio-demographic characteristics of participants

Variables	Frequency	Percentage
Gender		
Male	194	47.2
Female	217	52.8
Age		
<60 years	238	57.9
≥60 years	173	42.1
Marital		
Married	338	82.2
Single	26	6.3
Divorced	14	3.4
Widowed	33	8.0
Family size numbers		
<5members	130	31.6
≥5members	281	68.4
Residence		

Rural	52	12.7
Urban	359	87.3
Education level		
Attended informal education	55	13.4
Primary education	60	14.6
Secondary education (9-12 grade	68	16.5
college and above	228	55.5
Occupation		
government employee	156	38.0
NGO	22	5.4
Merchant	76	18.5
Farmer	41	10.0
Housewife	87	21.2
Unemployed	29	7.1
Income in Birr		
<5000Birr	283	68.9
≥5000BIRR	128	31.1

4.2. Clinical characteristics of patients

The result of the descriptive analysis showed among the total respondents, individual 134 (32.6%) of them had a family history of hypertension. The mean duration of hypertension was 5.09 (SD± 5.328). Above half of the respondents, 349 (84.9%) had follow up at every month, and 377 (91.7%) of the respondents were appointed at every month, and on the same appointment day, almost all respondent's BPs their own BP during appointment day. The BMI of the participants showed that 332 (80.8%) were overweight or obese and 79 (19.2%) health weight BMI of the total respondents.

Comorbidity

The result of the descriptive analysis showed Examining the appropriate patient card of the participant, the clinical results showed that there were no signs of co-morbidity such as diabetes, heart disease, in 302 (73.3%) were comorbiditynotseendespite109(26.7%) with comorbidities of disease DM72(17.5%), CKD19(4.6%) and Coronare artery disease18(4.4%)

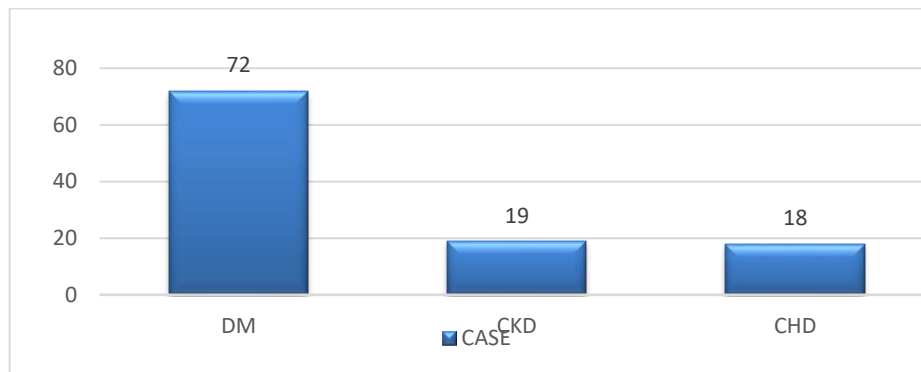


Figure 3. Figer Comorbidity among hypertensive patients attending Adare General Hospital, Motiti Fura Primary Hospital Millennium Health Centre, Alamura Health Centre 2024

The magnitude of uncontrolled blood pressure

Blood Peruser measurements of the patients revealed a mean SBP of 147.22 (SD± 11.140 mmHg) and a mean DBP of 91.91 (SD± 5.338 mmHg). The prevalence of uncontrolled hypertension was 55.7% (n=229) 95% CI= 50.8-60.6).

Table 3 indicates the clinical characteristics of hypertensive patients attending chronic follow up units' governmental hospitals in Hawassa City Administration 2024 (n =411)

Table 3: Clinical characteristics of hypertensive patients

Variables	Frequency	Percentage
Family History Of HTN		
No	277	67.4
Yes	134	32.6
Frequency Of Follow Up		
Weekly	15	3.6
Every two week	47	11.4
Every month	349	84.9
Frequency Of BP Measurements		
Every two wee	34	8.3
Every month	377	91.7
BMI		
Normal	79	19.2
Over wight	332	80.8
Duration of HTN		
<5ears	264	64.2
5-10years	106	25.8
>10years	41	10.0
Comorbidity		
No comorbidities	302	73.5
Comorbidities	109	26.5
Comorbidity types		
No comorbidities	302	73.5
DM	72	17.5
CKD	19	4.6
Coronare artery disease	18	4.4
Hypertension status		
Controlled HTN	182	44.3
Uncontrolled HTN	229	55.7
BMI		
Normal	79	19.2
Over weight	332	80.8

4.3. Life Style Related Factors /Behavioral Factors

The result of the descriptive analysis showed 20(4.9%) were current smokers and 46(11.2%) participants reported the use of current alcohol and khat consumption 39(9.5%). With regard to physical activity adherence,166 (40.2%) of participants were perform physical exercise. regarding to diet related adherence Among the study participants 141

(34.3 %) diet adherence were medication adherences more than half of participants 258 (62.8%) did not adheres medication.

Table 4: Life style modifications among hypertensive patients

Variables	Frequency	Percentage
Cigarette Smoking Status		
Never smoked	356	86.6
Current on smoking	20	4.9
Former smoked	35	8.5
Alcohol Status		
Never drinking	289	70.3
Current drinking	46	11.2
Former drinker	76	18.5
Chewed Khat Status		
No	372	90.5
Yes	39	9.5
Physical Activity		
Adherence		
Adherent	245	59.6
Non-adherent	166	40.4
Diet Related Adherence		
Adherent	141	34.3
Non-adherent	270	65.7
Medication Adherence		
Adherent	153	37.2
Non adherent	258	62.8

Table 4 shows Life style modifications among hypertensive patients attending in chronic follow up unit's governmental hospitals in Hawassa city administration 2024 (n =411) majority had not performed. Regarding to about methods prevent/controlled hypertension avoid smoking, avoid drinking excessive amount of alcohol, doing regular physical exercise showed as table4.

4.4. Knowledge awareness and understanding of UNHTN

In terms of knowing about uncontrolled HTN and the awareness of UHTN. Know about uncontrolledhypertension189 (46%) had known definition of uncontrolled hypertension 237 (57.7%) High blood pressure that cannot be controlled 183 (44.5%) participants had not known without anti hypertension medication to controlled blood pursuer, towards self-checking their own blood pressure and has no blood pressure apparats 377 (91.7%)

Indicates the exploring awareness and understanding of HTN among hypertensive patients attending in chronic follow up units' governmental hospitals in Hawassa city administration 2024 (n=411).

Table 5: Exploring awareness and understanding of HTN

Variables	Frequency	Percentage
Continuously elevated blood pressure		
No	243	59.1
Yes	168	40.9
Definition of uncontrolled hypertension		
No	222	54.0
Yes	189	46.0
Blood pressure that can be controlled at a certain level		
No	237	57.7
Yes	174	42.3
Know about years did blood pursuer medication have been taken		
No	253	61.6
Yes	158	38.4
know without anti hypertension medication to controlled blood pursuer		
No	228	55.5
Yes	183	44.5
Know about methods prevent/controlled hypertension		
Avoid smoking	81	19.7
Avoid drinking excessive amount of alcohol	78	19.0
Doing regular physical exercise	42	10.2
Consuming fruits and vegetable and reducing consumption of excess fat	94	22.9
Restricting sodium consumption	116	28.2
Do you have checked your own BP (Awareness)/have		
No	377	91.7
Yes	34	8.3

4.4. Determinants of Uncontrolled Blood Pressure

In bivariate analysis variables such as age, sex, educational level, occupation, income, family size, education status, monthly income, diet-related adherence, physical activity adherence, alcohol consumption adherence, khat consumption status, medication adherence and first-degree history of HTN, duration of HTN, frequency of follow up, frequency of BP measurement, co-morbidity, BMI, were analysed. Eight variables namely age, family size, resident, co-morbidity, diet related adherence, physical activity adherence, medication adherence and BMI were found significantly associated. In multivariate analysis variables were selected, age, diet-related, physical activity and co-morbidity are found statistically significant predictors of uncontrolled hypertension. At p-value=000 <60 years of age three times less likely odds-on uncontrolled hypertension than ≥ 60 yearsof age hypertensive patient (AOR=3.287 95% CI: 2.043-5.288). Hypertensive patients who were non-adherent to diet related adherence had 2.95 times increased odds of having uncontrolled BP than patients who were adherent (AOR=2.95, 95% CI: 1.592-5.475) and who were non-adherent to physical activities adherence have had 1.803 times increased odds of having uncontrolled BP than patients who were adherent (AOR=1.803 95% CI: 1.079-3.014) Patients who have had co-morbidity were found 2.737 times increased odds to have uncontrolled BP than those patients without co-morbidities P-v.000 (AOR = 2.737, 95% CI: 1.612-4.647). Table 5 it indicates bivariable and multivariable logistic regression analysis result for significant variables among hypertensive patients attending in chronic follow up units' governmental hospitals at Hawassa city administration 2024 (n =411).

Table 6: Bivariable and multivariable logistic regression analysis

Variable	Blood pressure controlled		COR (95% CI)	AOR (95% CI)	P-value
Age	Controlled n (%)	Uncontrolled n (%)			
<60 years	136(57.1%)	102(42.9%)	1	1	
≥60 years	46(25.6%)	124(73.4%)	3.681(2.409- 5.624)	3.287(2.043- 5.288)	.000
Family Numbers					
<5members	67(36.6%)	105(63.2%)	1	1	
≥5members	63(27.5%)	166(28%)	1.538(1.011- 2.332)	1.446(.904- 2.312)	
Resident					
Rural	16(30.2%)	36(63.9%)	1	1	
Urban	166(46.2%)	193(53.8%)	.517(.572- .905)	.569(.286- 1.133)	
Diet Related Adherence					
Adherent	80(44.0%)	102(56.0%)	1	1	
Non-adherent	65(28.4%)	164(71.6%)	2.472(1.628- 3.750)	2.952(1.592- 5.475)	.001
Physical Activity Adherence					
Adherent	125(68.7%)	57(31.3%)	1	1	
Non-adherent	121(52.8%)	108(47.2%)	2.968(1.961- 4.514)	1.803(1.079- 3.014)	.025
BMI					
Normal	43(54.4)	38(48.6)	1	1	
Over weight	138(41.9)	193(58.1)	1.658(1.012- 2.717)	.1.314(.754- 2.292)	
Comorbidity					
No comorbidities	154(51.0)	148(49.0)	1	1	
comorbidities	28(28.7)	81(74.3)	3.010(1.853- 4.890)	2.737(1.612- 4.647)	.000
Medication Adherence					
Adherent	82(53.6)	79(46.4)	1	1	
Non-Adherent	100(38.8)	158(61.2)	1.625(1.218- 2.795)	.730(1.612- 4.647)	

5. Discussion

The result of this study showed that of hypertensive patients on follow-up had uncontrolled hypertension. These finding results showed almost half of the patients had on follow-up had uncontrolled hypertension. Major factors associated with uncontrolled BP were age, dietary related adherence, comorbidity and physical activity. A study from USA also showed that patients aged between 40 and 60 years were associated with controlled BP than those aged greater than 60 years [43].

In this study, the prevalence of uncontrolled hypertension was found to be 55.7%, which is almost in line with the study done in sub-Saharan Africa (SSA) (78.6%) [8] and the study done in Iran (61.7%) [10] and almost in line with the study done in the Mpumalanga Province, South Africa (56.83%) [23]. Which is greater than the study done in Northern Ethiopia Tigray (48.6%) [29] and at Saint Paul's Hospital, Millennium Medical College, Addis Ababa, Ethiopia (52.1%) [1]. Which is consistent with study done in Shashemene Referral Hospital, Oromia, Ethiopia (59.7%) [44] and undergoing follow-up at public health facility ambulatory clinics in Bishoftu town Ethiopia (58.8%) [45].

Sustaining appropriate blood pressure control in hypertensive patients reduces the worldwide burden of the disease by reducing morbidity and mortality associated to hypertension [41]. Research has indicated that even after obtaining medication, a sizable portion of hypertensive individuals still have uncontrolled blood pressure [46].

These discrepancies may relate to differences in the population's lifestyle, cultural, economic situation, access to health care facilities, and educational attainment. This study has showed as age was found statistically significant predictors of uncontrolled hypertension in this study. This study finding showed that Patients of age ≥ 60 years, there is a statistically significant association with a higher likelihood of having uncontrolled comorbidities compared to those aged < 60 years [47]. There are also studies done in Ethiopia that support this study finding. A hospital-based cross-sectional study done at Debre Tabor district hospital, Northwest Ethiopia showed that the rate of uncontrolled BP was found to be higher among participants less than 60 years of age [48].

This study has showed as was dietary practices found statistically significant predictors of uncontrolled hypertension in this study. This study finding showed that Patients non diet

adherence had 2.952 times more likely than risk of having uncontrolled BP compared to patient's adherence.

According to this study, people with hypertension who followed a poor diet were more likely than those who followed a high diet to have uncontrolled hypertension. Unhealthy dietary practices include consumption of a diet that is high in salt/sodium, low in potassium consumption, unhealthy dietary fat and oils, refined sugar and alcohol, and low fruit and vegetable not dietary adherent having uncontrolled BP than patients who were adherent. Similarly, a study conducted in West Africa [49]. People's eating habits are different in different places, and this has become a cause of uncontrolled hypertension that they cannot control. The environment in which the study is being conducted has also been. This finding is supported by a study done in China. [17] and Ayder comprehensive specialized hospital, Tigray, Ethiopia [50]. Different dietary habits, education level, Source of income, living environment are mentioned as reasons.

Physical activity is the other factor that was found to be significantly associated with uncontrolled BP in this study. This study revealed that hypertensive patients who were not adherent to physical activity more likely higher risk of having uncontrolled BP than patients who were adherent, which is consistent with a study done in patients undergoing follow-up at public health facility ambulatory clinics in Bishoftu town, Ethiopia[45]. Similarly, a study conducted in a multi-centre study and undergoing follow-up at public health facility ambulatory clinics in Bishoftu town, Ethiopia: a multi-centre study of patients on follow-up at public hospitals, Eastern Ethiopia' which showed that lack of physical activity was statistically associated with uncontrolled hypertension [51].

Co-morbidity was also found statistically significant predictors of uncontrolled hypertension in this study that patients who had co-morbidity were found two times more likely to have uncontrolled BP than those patients without co-morbidities. This finding is supported by a study done in South Asia which showed diabetic and kidney disease co-morbidities were associated with uncontrolled hypertension[52]. There are also the same studies done in Dodoma, Tanzania: across sectional study diabetic disease comorbidities were associate with uncontrolled hypertension[16]. There are also some studies done in chronic kidney disease attending tertiary hospitals in Dodoma, Tanzania [53]. There are also some studies done in Ethiopia that showed co morbidity had significant association with uncontrolled BP in Comorbid Type 2 Diabetic Patients in Southeast Ethiopia[54] and Ayder hospital, Tigray region [18]. In similarly to this finding, the study done at Bedele

General Hospital, Southwest Ethiopia, a cross-sectional study showed that the coincide of HTN with other comorbidities was statistically associated with the occurrence of uncontrolled BP[13]. In contrary to this finding, the study done at Gondar University hospital in 2016 showed that the coincidence of HTN with other comorbidities was not statistically associated with the occurrence of uncontrolled BP[55] This discrepancy could be due to the early detection, control and appropriate management of co-morbid conditions.

6. Conclusions

In order to determine the extent and distribution of uncontrolled hypertension that cannot be controlled during the study, the research was conducted by including the variable characteristics that are necessary for the study. Socio demographic Characteristics, Behavioral physical activity, drug use, Clinical characteristics and knowledge of respondents regarding hypertension prevention. age, diet-related, physical activity and co-morbidity are found statistically significant predictors of uncontrolled hypertension at p -value=000 <60 years of age three times less likely odds-on uncontrolled hypertension than ≥ 60 yearsof age hypotensive patent Hypertensive patients who were non-adherent to diet related adherence had 2.95 times increased odds of having uncontrolled BP than patients who were adherent and who were non-adherent to physical activities adherence had 1.803 times increased odds of having uncontrolled BP than patients who were adherent Patients who had co-morbidity were found 2.737 times increased odds to have uncontrolled BP than those patients without co-morbidities

Therefore, in the research area, there were, Age, diet non adherence, nonphysical exercise adherence and co-morbidity, which are independently predicted

7. Recommendations

Recommendation to Hawassa health bureau It is advised that evidence-based medications be used in the treatment of hypertension in order to guarantee better blood pressure controls for hypertensive patients visiting governmental hospitals under the administration of the city of Hawassa To evaluate Unhealthy diet adherence and medication adherence and adjust counselling as necessary. To provide education to medical professionals about new advancements in the treatment of hypertension.

Advise patients to follow suggestions for lifestyle adjustments to improve hypertension self-management

Recommendation Public health facilities to use evidence-based medicines in the management of hypertension.

To frequently adjust healthy diet to achieve target BP.

To assess adherence to medications and provide counselling accordingly.

To counsel patients to adhere to lifestyle modifications recommendations

Recommendation to health professionals Future researchers should make use of objective metrics to evaluate antihypertensive medication adherence to evaluate obstacles to applying evidence-based guidelines for the control of

8. Strength and Limitations

Strengths

One of the strong points is that there is a separate medical centre for blood pressure patients at all health centres. Although it is not complete, it is a strong point to have a medical follow-up file for all patients. The introduction of digital medical management in some health facilities is another strong point that can be mentioned.

Limitations

Blood pressure readings were taken from patients' medication records; hence, no information was available on how BP was measured. A self-reported measure of medication adherence was used, which could have caused an overestimation of adherence to medications. Some individuals experience this when visiting a healthcare provider, leading to an increase in blood pressure. Despite white-coat hypertension, it could have caused an underestimation of BP control as office BP readings were used. A cross-sectional study design was used, which doesn't allow for temporal relationships to be established.

Reference

- [1] Y. Sisay, H. Abera, T. D. Biratu, and T. G. Legesse, “Uncontrolled Hypertension and Behavioral Risk Factors among Adult Hypertensive Patients at Saint Paul ’ s Hospital , Millennium Medical College , Addis Ababa , Ethiopia,” vol. 2022, 2022.
- [2] Y. Kenore, S. Abrha, and A. Yosef, “Determinants of Hypertension Among Patients with Diabetes mellitus in Public Hospitals of Kembata Tambaro Zone , South Nations Nationalities and Peoples Region , Ethiopia , 2021 ; A Case Control Study,” no. September, pp. 2141–2152, 2022.
- [3] S. Sakhuja *et al.*, “Reasons for Uncontrolled Blood Pressure Among US Adults : Data From the US National Health and Nutrition Examination Survey,” no. November, pp. 1567–1576, 2021, doi: 10.1161/HYPERTENSIONAHA.121.17590.
- [4] L. Abdisa *et al.*, “Uncontrolled hypertension and associated factors among adult hypertensive patients on follow-up at public hospitals , Eastern Ethiopia : A multicenter study,” 2022, doi: 10.1177/20503121221104442.
- [5] A. E. Schutte *et al.*, “Addressing global disparities in blood pressure control : perspectives of the International Society of Hypertension,” *Cardiovasc. Res.*, vol. 119, no. 2, pp. 381–409, 2023, doi: 10.1093/cvr/cvac130.
- [6] M. Babirye, T. M. Yadesa, P. S. Obwoya, and R. Tamukong, “Prevalence and factors associated with drug therapy problems among hypertensive patients at hypertension clinic of Mbarara Regional Referral Hospital , Uganda : a | cross-sectional study,” pp. 1–13, 2023, doi: 10.1177/https.
- [7] M. M. Ibrahim and A. Damasceno, “Hypertension in developing countries,” *Lancet*, vol. 380, no. 9841, pp. 611–619, 2012, doi: 10.1016/S0140-6736(12)60861-7.
- [8] S. F. Mohamed, O. A. Uthman, M. K. Mutua, G. Asiki, M. S. Abba, and P. Gill, “Prevalence of uncontrolled hypertension in people with comorbidities in sub- - Saharan Africa : a systematic review and meta- - analysis,” pp. 1–10, 2021, doi: 10.1136/bmjopen-2020-045880.
- [9] F. Lemessa and M. Lamessa, “Hypertension and Management Uncontrolled Hypertension and Associated Factors among Hypertensive Adults in Bale Zone Public Hospitals , Ethiopia,” vol. 7, no. 1, pp. 1–9, 2021, doi: 10.23937/2474-

3690/1510057.

- [10] F. Farhadi, R. Aliyari, H. Ebrahimi, H. Hashemi, and M. H. Emamian, “Prevalence of uncontrolled hypertension and its associated factors in 50 – 74 years old Iranian adults : a population-based study,” pp. 1–10, 2023.
- [11] M. D. H. Id *et al.*, “Effect of a one-time financial incentive on linkage to chronic hypertension care in Kenya and Uganda : A randomized controlled trial,” vol. 56, pp. 1–15, 2022, doi: 10.1371/journal.pone.0277312.
- [12] M. A. Alsofyani, A. O. Aloufi, N. S. Al Qhtani, S. O. Bamansour, and R. S. Almathkori, “Factors related to treatment adherence among hypertensive patients : A cross - sectional study in primary healthcare centers in Taif city,” 2022, doi: 10.4103/jfcm.jfcm.
- [13] T. Sheleme, O. Jilo, F. Bekele, and W. Olika, “Uncontrolled blood pressure and contributing factors among patients with hypertension at outpatient care of Bedele General Hospital , Southwest Ethiopia : A cross-sectional study,” 2022, doi: 10.1177/20503121221126333.
- [14] M. Cherfan *et al.*, “Unhealthy behaviors and risk of uncontrolled hypertension among treated individuals-The CONSTANCES population-based study,” pp. 1–12, 2020, doi: 10.1038/s41598-020-58685-1.
- [15] K. C. Ferdinand, “Uncontrolled hypertension in sub-Saharan Africa : Now is the time to address a looming crisis,” pp. 2111–2113, 2020, doi: 10.1111/jch.14046.
- [16] M. M. Gladys, J. Gachohi, and A. Muriithi, “Prevalence of uncontrolled hypertension and associated factors among hypertensive patients attending medical outpatient clinic, Thika level 5 hospital, Kenya,” *Int. J. Community Med. Public Heal.*, vol. 8, no. 6, p. 2733, 2021, doi: 10.18203/2394-6040.ijcmph20211976.
- [17] W. J. Tu *et al.*, “China stroke surveillance report 2021,” *Mil. Med. Res.*, vol. 10, no. 1, pp. 1–26, 2023, doi: 10.1186/s40779-023-00463-x.
- [18] G. B. Gebremichael, K. K. Berhe, and T. M. Zemichael, “Uncontrolled hypertension and associated factors among adult hypertensive patients in Ayder comprehensive specialized hospital, Tigray, Ethiopia, 2018,” *BMC Cardiovasc. Disord.*, vol. 19, no. 1, May 2019, doi: 10.1186/S12872-019-1091-6.
- [19] M. Stoutenberg *et al.*, “Acceptability and feasibility of home - based hypertension

- and physical activity screening by community health workers in an under - resourced community in South Africa,” *J. Public Health (Bangkok)*., no. 0123456789, 2023, doi: 10.1007/s10389-023-01873-w.
- [20] WHF, “World Heart Vision 2030,” pp. 4–9, 2022.
- [21] World Health Organization (WHO)., “Technical package for cardiovascular disease management in primary health care.,” *Report*, pp. 1–76, 2016, [Online]. Available: https://www.who.int/cardiovascular_diseases/publications/en/
- [22] Z. Gao, S. Chen, X. Huang, J. Ye, and J. Liu, “Risk Prediction Model for Uncontrolled Hypertension in Chinese Community Data Sources and Study Population,” vol. 8, no. January, pp. 4–11, 2022, doi: 10.3389/fcvm.2021.808071.
- [23] C. Masilela, B. Pearce, J. J. Ongole, O. V. Adeniyi, and M. Benjeddou, “Cross-sectional study of prevalence and determinants of uncontrolled hypertension among South African adult residents of Mkhondo municipality,” pp. 1–10, 2020.
- [24] A. Ababa, M. Molla, A. Id, A. W. Yalew, and N. D. Kabeta, “Prevalence and risk factors of hypertension among adults : A community based study in,” pp. 1–14, 2021, doi: 10.1371/journal.pone.0248934.
- [25] F. Amare, B. Hagos, M. Sisay, and B. Molla, “Uncontrolled hypertension in Ethiopia : a systematic review and meta-analysis of institution-based observational studies,” vol. 3, pp. 1–9, 2020.
- [26] Z. Demelash, M. Adugna, G. Sisay, and A. Mohammed, “Prevalence and associated factors of hypertension complications among hypertensive patients at University of Gondar Comprehensive Specialized Referral Hospital,” *Clin. Epidemiol. Glob. Heal.*, vol. 13, no. December 2021, p. 100951, 2022, doi: 10.1016/j.cegh.2021.100951.
- [27] M. Karczewski and A. Szuba, “Sociodemographic and behavioral factors associated with controlled hypertension after years of observation of a PURE Poland cohort study”.
- [28] T. Lidetu and D. Zewdu, “Incidence and predictors of post stroke seizure among adult stroke patients admitted at Felege Hiwot compressive specialized hospital , Bahir Dar , North West Ethiopia , 2021 : a retrospective follow up study,” *BMC Neurol.*, pp. 1–7, 2023, doi: 10.1186/s12883-023-03083-z.

- [29] W. Aberhe, T. Mariye, D. Bahrey, K. Zereabruk, A. Hailay, and G. Mebrahtom, “Prevalence and factors associated with uncontrolled hypertension among adult hypertensive patients on,” vol. 36, no. 187, pp. 1–14, 2020.
- [30] A. Rose, W. Id, Z. Feng, and N. Mcgrath, “The prevalence of hypertension and hypertension control among married Namibian couples,” vol. 35, pp. 1–20, 2023, doi: 10.1371/journal.pone.0289788.
- [31] S. Dey *et al.*, “Socio - demographic , behavioural and clinical factors influencing control of diabetes and hypertension in urban Mysore , South India : a mixed - method study conducted in 2018,” *Arch. Public Heal.*, pp. 1–15, 2022, doi: 10.1186/s13690-022-00996-y.
- [32] Z. Qin *et al.*, “Association of socioeconomic status with hypertension prevalence and control in Nanjing : a cross - sectional study,” *BMC Public Health*, pp. 1–9, 2022, doi: 10.1186/s12889-022-12799-5.
- [33] N. Kataria, V. C. Kalyani, S. Gulia, and G. Kaleeswari, “Knowledge Regarding Hypertension and Amount of Diet Consumption Among Adults From Uttarakhand : A Comparative Survey,” vol. 15, no. 5, 2023, doi: 10.7759/cureus.39065.
- [34] O. Odukoya, O. Badejo, K. Sodeinde, and T. Olubodun, “Behavioral risk factors for hypertension among adults living with HIV accessing care in secondary health facilities in Lagos State , Nigeria,” 2020, doi: 10.4103/jfmpe.jfmpe.
- [35] “NOTE: This preprint reports new research that has not been certified by peer review and should not be used to guide clinical practice.,” 2023.
- [36] S. L. M. Madela, N. W. Harriman, R. Sewpaul, A. D. Mbewu, S. Sifunda, and T. Manyapelo, “Individual and area - level socioeconomic correlates of hypertension prevalence , awareness , treatment , and control in uMgungundlovu , KwaZulu - Natal , South Africa,” *BMC Public Health*, pp. 1–15, 2023, doi: 10.1186/s12889-023-15247-0.
- [37] A. K. Seth, S. Kansal, H. R. Salve, S. Gupta, R. Kumar, and P. Misra, “The Role of Noncommunicable Disease Clinics in Improving Control of Hypertension and Diabetes Among Adults Residing in Rural Ballabgarh , Haryana,” vol. 15, no. 4, 2023, doi: 10.7759/cureus.37283.
- [38] G. C. Michael and S. T. Tanimu, “Antihypertensive medication non-adherence and

- its associated factors among adult patients with uncontrolled hypertension in a primary care setting,” 2023, doi: 10.4103/ijcfm.ijcfm.
- [39] M. Mekonene, K. Baye, and S. Gebremedhin, “Epidemiology of hypertension among adults in Addis Ababa , Ethiopia,” *Prev. Med. Reports*, vol. 32, no. August 2022, p. 102159, 2023, doi: 10.1016/j.pmedr.2023.102159.
- [40] B. L. Iverson and P. B. Dervan, “No 主観的健康感を中心とした在宅高齢者における健康関連指標に関する共分散構造分析Title.”
- [41] O. Article, “The eight-item Morisky Medication Adherence Scale: validation of its Persian version in diabetic adults,” vol. 12, no. 1, pp. 77–83, 2021, doi: 10.22088/cjim.12.1.77.
- [42] J. Chen *et al.*, “Physical activity and eating behaviors patterns associated with high blood pressure among Chinese children and adolescents,” pp. 1–9, 2023.
- [43] Y. Ostchega, G. Zhang, J. P. Hughes, and T. Nwankwo, “Factors associated with hypertension control in US Adults Using 2017 ACC/AHA Guidelines: National Health and Nutrition Examination Survey 1999-2016,” *Am. J. Hypertens.*, vol. 31, no. 8, pp. 886–894, 2018, doi: 10.1093/ajh/hpy047.
- [44] A. Anota and T. Nedi, “Blood Pressure Control and Associated Factors Among Hypertensive Patients Attending Shashemene Referral Hospital ,” 2022, doi: 10.1177/00185787211061372.
- [45] M. Solomon, Y. M. Negussie, N. T. Bekele, and M. S. Getahun, “Uncontrolled blood pressure and associated factors in adult hypertensive patients undergoing follow - up at public health facility ambulatory clinics in Bishoftu town , Ethiopia : a multi - center study,” *BMC Cardiovasc. Disord.*, pp. 1–13, 2023, doi: 10.1186/s12872-023-03290-z.
- [46] V. Visco *et al.*, “Dif fi cult-to-control hypertension : identi fi cation of clinical predictors and use of ICT-based integrated care to facilitate blood pressure control,” *J. Hum. Hypertens.*, pp. 467–476, 2018, doi: 10.1038/s41371-018-0063-0.
- [47] G. T. Hiura *et al.*, “Age and Comorbidities Are Associated With Therapeutic Inertia Among Older Adults With Uncontrolled Blood Pressure,” no. October 2023, pp. 280–289, 2024.

- [48] D. F. Teshome, A. F. Demssie, and B. M. Zeleke, “Determinants of blood pressure control amongst hypertensive patients in Northwest Ethiopia,” pp. 1–11, 2018.
- [49] N. P. Batubo, J. B. Moore, and M. A. Zulyniak, “Dietary factors and hypertension risk in West Africa: A systematic review and meta-analysis of observational studies,” *J. Hypertens.*, vol. 41, no. 9, pp. 1376–1388, 2023, doi: 10.1097/HJH.0000000000003499.
- [50] G. B. Gebremichael, K. K. Berhe, and T. M. Zemichael, “Uncontrolled hypertension and associated factors among adult hypertensive patients in Ayder comprehensive specialized,” vol. 6, pp. 1–10, 2019.
- [51] L. Abdisa *et al.*, “Uncontrolled hypertension and associated factors among adult hypertensive patients on follow-up at public hospitals, Eastern Ethiopia: A multicenter study,” *SAGE Open Med.*, vol. 10, 2022, doi: 10.1177/20503121221104442.
- [52] T. H. Jafar *et al.*, “Determinants of Uncontrolled Hypertension in Rural Communities in South Asia-Bangladesh, Pakistan, and Sri Lanka,” *Am. J. Hypertens.*, vol. 31, no. 11, pp. 1205–1214, 2018, doi: 10.1093/ajh/hpy071.
- [53] D. D. Katatwire, “High prevalence of uncontrolled hypertension among patients with early chronic kidney disease attending tertiary hospitals in Dodoma , Tanzania,” pp. 1–19, 2022, [Online]. Available: europepmc.org
- [54] F. Desta *et al.*, “Blood Pressure Control and Associated Factors among Hypertension Comorbid Type 2 Diabetic Patients in Southeast Ethiopia,” *Int. J. Hypertens.*, vol. 2024, 2024, doi: 10.1155/2024/6668436.
- [55] T. M. Abegaz, O. A. Abdela, A. S. Bhagavathula, and F. S. Teni, “Magnitude and determinants of uncontrolled blood pressure among hypertensive patients in Ethiopia: Hospital-based observational study,” *Pharm. Pract. (Granada)*, vol. 16, no. 2, pp. 1–7, 2018, doi: 10.18549/PharmPract.2018.02.1173.

ANNEXES

Annex I: Informed Participant Consent Form

English version questionnaire

Informed Participant Consent Form

Greeting; how you are my name is -----. I'm here from Hawassa University College of Medicine and Health Sciences, Department of Public Health, Ethiopian Field Epidemiology and Laboratory Training Program, Teketel Negash It is on behalf of me. This study is being conducted to find out the main causes of high blood pressure in patients over eighteen years old. This study has been a major contribution to the prevention and control of uncontrolled blood pressure by identifying the problem for more than eighteen years. The results of this study will inform policy making and partner organizations to understand the relationship between the key risk factors for Uncontrolled blood pressure in the over 18 years old population. In addition, it will be used as baseline information to identify the key problems of uncontrolled hypertension in the study area. You are one of the individuals selected to participate in this study based on a repeated random sampling calculation. You have every right to participate in the study. Your participation is entirely on your own volition. If you choose to participate, you can stop or withdraw at any time. There will be no problem with your participation in the study. If you agree to participate in the study, we will ask you about your social lifestyle, physical activity, and healthy eating habits. We would like to assure you that your name will not be mentioned and will not be passed on to any party. In addition, the information we collect from you will not be associated with your name we lock it with secret code keys to protect its confidentiality. Your participation is voluntary and you have the right not to answer any questions you do not wish to answer. Your consent and cooperation are important to the effectiveness of the study. The interview will last 30 minutes.

Annex II: English version of informed consent

Having the above information, I honourably invite you to participate in the study.

Are you willing to participate in the study?

- 1. Yes
- 2. No

If yes, continue the questionnaire. If no, write the reason for refusal and skip to the next participant

Interviewer: Name-----

Questionnaire number-----

Zone -----woreda -----kebele-----Gott

Date of interview-----Time started-----Time completed-----

Result of interview:

- 1. Completed
- 2. Respondent not available
- 3. Refused
- 4. Partially completed

Checked by Supervisor:

Name _____ Signature_____

For any further information, inconvenience and problem related to questionnaire please contact principal investigator.

Name of principal investigator: Teketel Negash Tell: +251916830108

Email negashtekete@gmail.com

Annex III: Amharic version of subject informed consent form

የአማርኛ ቃለ መጠይቅ

በመረጃ የተደገፈ የተሳታፊ ስምምነት ቅጽ

የአማርኛ መጠይቅ

በመረጃ የተደገፈ የተሳታፊ ስምምነት ቅጽ

ሰላም እንዴት ነዎት ። ስሜ -----ይባላል ። የመጣሁት የሀዋሳ ዩኒቨርሲቲ ህክምናና ጤና ሣይንስ ኮሌጅ የህብረተሰብ ጤና ትምህርት ክፍል የኢትዮጵያ ፊልድ ኢፒድሚዮሎጅ እና ላቦራቶሪ ስልጠና ፕሮግራም ተማሪ የሆነውን ተከተል ነጋሽንወክዬ ነው። ይህም ጥናት እየተካሄደ ያለው ከአስራስምንት አመት በላይ በተመረጡት ሆስፒታል ውስጥ ላሉ ያልተቆጣጠሩት የደም ግፊት በሽተገኛዎች ዋነኛ ቁልፍ መንስኤዎች ለማወቅ ነው ።

ይህ ጥናት ከአስራስምንት አመት በላይ ችግሩን በመለየት የደም ግፊት በሽታን ለመከላከልና ለመቆጣጠር በሚደራግ ስራ ላይ ትልቅ አስተዋፅኦ አለው። የዚህ ጥናት ውጤት ፖሊሲ ለመቅረፅ እና አጋር ድርጅቶች ከ ከአስራስምንት አመት በላይ ላሉ ያልተቆጣጠሩት የደም ግፊት በሽታን ቁልፍ ችግሮች መካከል ያለውን ቁርኝት ግንዛቤ እንዲወስዱ ያደርጋል። በተጨማሪም በጥናቱ ቦታ ላይ ከአስራስምንት አመት በላይ ላሉ ያልተቆጣጠሩት የደም ግፊት በሽታ ቁልፍ ችግሮች ለማወቅ እንደ መነሻ መረጃ ይሆናል። እርሶዎ በዚህ ጥናት እንዲሳተፉ የተመረጡት በተደጋጋሚ በተወሰደ የአጋጣሚ የናሙና አወሳሰድ ስሌት መሰረት በዚህ ጥናት አላማ ከተመረጡ ግለሰቦች መካከል አንዱ ነዎት። በጥናቱ ሊይ ያለ መሳተፍ ሙሉ መብት አለዎት። የእርሶ ተሳትፎ ሙሉ በሙሉ በእርሶዎ ሙሉ ፍቃደኝነት ሊይ የተመሰረተ ነው። ቢመሳተፉ ፍቃደኛ ከሆኑ በኋላም በፈለጉት ጊዜ ማቆም ወይም ማቋረጥ ይችላሉ። በጥናቱ ባመሳታፎ የሚደርስብዎት ምንም አይነት ችግር አይኖርም። በጥናቱ ለመሳተፍ ከተስማሙ የማህበራዊ አኗኗር ሁኔታዎችን፣ የሰውነት አካል እንቅስቃሴን ጤናማ የአመጋገብ ስርአትን አይደዘን እንጠይቅዎታለን። ስሞዎት እንደ ማይጠቀስ እና ለማንም አካል ተላልፎ እንደማይሰጥ ልናረጋግጥልዎት እንወዳለን። በተጨማሪም ከእርሶ የምንሰበስበው መረጃ ከስምዎ ጋር አይያያዝም። ሚስጥራዊነቱን ለመጠበቅ በሚስጥር ኮድ ቁሌፎች እንቆልፋለን። ተሳትፎዎ በፍቃደኝነት ሲሆን መመለስ ያልፈለጉትን ጥያቄ ያለመመለስ መብት አለዎት። መልካም ፍቃድዎ እና ትብብርዎ ለጥናቱ ውጤታማነት ትልቅ አስተዋፅኦ አለው። ቃለመጠይቁ 30 ደቂቃ የሚፈጅ ይሆናል።

Annex IV: Amharic version of subject informed consent form

የመስማማት መጠየቂያ / ማረጋገጫ ቅፅ /

በተሰጠዎት መረጃ መሰረት ጥናቱ ሊደ ለይ እንዲሳተፉ እጋብዝታለሁ። ለመሳተፍ ፍቃደኛ ነዎት?

- 1. አዎ
- 2. አይደለሁም

ፍቃደኛካልሆኑምክንያቱንጽፋውወደሚቀጥታሆውተሳታፊእለፍ

ቃለመጠይቅ አድራጊው ስም -----

የቃለመጠይቁ ቁጥር -----

ዞን----- ወረዳ ----- ቀበሌ ----- ጎጥ-----

ቃለ መጠይቁ የተካሄደበት ቀን ----- የተጀመረበት ሰዓት----- ያለቀበት ሰዓት-----

የተሰበሰበው መረጃ ውጤት

- 1. ሙሉ በሙሉ የተሞላ
- 2. በከፊል የተሞላ
- 3. ምንም ያልተሞላ
- 4. ተሳታፊው አልተገኘም

በተቆጣጣሪዎች ተረጋግጧል፡ (Supervisor) ስም----- ፊርማ-----

ለተጨማሪ ማብራሪያ የዋና አጥኝውን አድራሻ ይጠቀሙ።

ስም ተከተል ነጋሽ ኢሜይል:negashtekete@gmail.com

ስልክ: +251916830108

Annex V: Annexed data collection tool

A. Questionnaire English Version

1. **Instruction:** Tick (✓) in provided number and fills the blank spaces by asking the patient.

Part I - Participants' Socio demographic Characteristics and hypertension related Variable

S. no.	Questions	Alternative choices for Response	Remark
100	Age Years	
101	Gender	1 Male 2. Female	
102	Marital status	1. Married 2. Single 3. Divorced 4. Widowed	
103	What is the highest education level you completed?	1. No formal education 2. Primary education (1-8 grade) 3. Secondary education (9-12 grade) 4. college and above	
104	What is your current occupation?	1. government employee 2. NGO employee 3. Merchant 4. Farmer 5. House wife 6. Unemployed	
105	Residence	1. Urban 2. Rural	
106	What is your family size? (In number)	-----number	
107	How much is your monthly income	-----Birr	
Section II. Behavioural Measurements			
Cigarettes use			
200	Have you ever smoked any cigarette products like cigars or pipes?	1. Never smoked 2. Current on smoking 3. Former smoked	
201	Did you smoke in the past 30 days prior to this survey?	1. Yes 0. No	

202	How frequent do you smoke /?	1. daily 2. 2. 5-6 days week 3. 3. 3-4 days week 4. 4. 1-2 days week	
203	For how long have you smoked cigarette?	-----Year	
204	On average, how many cigarettes do you smoke each day?	-----(-in numbers)	
Misuse Alcohol Consumption			
205	Have you ever consumed alcoholic drink? (“tella”,” tej”, “Araki”, beer, wine, spirit)	1. Never drinking 2. Current drinking 3. Former drinker	
206	Did you drink alcohol in the past 30 days?	1. Yes 0. No	
207	How frequent do you drink alcohol in a week?	1. daily 2. 5-6 days per week 3. 3-4 days per week 4. 1-2 days per week	
208	For how long have you been drinking?	----- (in year)	
209	How many glass/ bottles do you drink at a time? (specify the type of drink)	_____ in numbers	
Khat chewing			
210	Have you ever chewed khat?	1. Yes 0. No	
211	How frequent do you chew?	1. daily 2. 5-6 days per week 3. 3-4 days per week 4. 1-2 days per week	
212	For how long have you been chewing chat?	_____ (in years)	
Caffeine Consumption			
213	Do you drink coffee?	1. Yes 0. No	
214	How many days in a week do you drink coffee?	1. daily 2. 5-6 days in a week 3. 3-4 days in a week 4. 1-2 days in a week	
215	How many cups of coffee do you drink in these days?	1. one cup a day 2. two cups a day 3. three and more cups a day	
Diet (health diet)			
216	How many days do you eat fruits in a week?	_____ Number of days	

217	How many servings of fruits do you eat in these days?	_____Number of servings	
218	How many days do you eat vegetables in a week?	_____Number of days	
219	How many servings of vegetables do you eat in these days?	__Number of servings	
220	Do you eat animal fat (butter, fatty meat)?	1. Yes 0. No	
221	How many days do you eat animal fat in a week?	__ Number of days	
222	How many servings of animal fat do you eat in these days?	__ Number of servings	
Salt consumption			
223	Do you use salt in your food?	1. Yes 0. No	
224	Do you use additional top added salt on plate after food is prepared with sufficient amount of salt?	1. Yes 0. No	
Adherence Physical activity			
225	Do you perform physical exercise?	1. Yes 0. No	
226	Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like (carrying or lifting heavy loads, digging or construction work) for at least 20 minutes continuously?	1. Yes 0. No	
227	Do you do 20 minutes or more a day of vigorous physical activities, 3 or more days a week.	1. Yes 0. No	
Travel to and from places (. Adherence walk)			
228	Do you walk for at least 20 minutes a day continuously to get to and from places?	1. Yes 0. No	
229	In a typical week, for how many days do you walk for at least 20 minutes continuously to get to and from places?	_____days	
230	How much time do you spend walking for travel on a typical day?	__hours--- minutes	
231	What do you use to go and come from place to place?	1. on foot 2. bicycle 3. engine using vehicle	

Medication adherence related questions			
S. No	Questions	Yes	No
232	Do you sometimes forget to take your pills?		
233	People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were there any		
234	Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?		
235	When you travel or leave home, do you sometimes forget to bring along your medicine?		
236	Did you take all your medicine yesterday?		
237	When you feel like your symptoms are under control, do you sometimes stop taking your medicine?		
238	Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?		
239	How often do you have difficulty remembering to take all your medicine?		
Section III: Clinical characteristics of patients			
History of co-morbidity			
300	Do you have a first-degree family history of hypertension?	1. Yes 0. No	Remark
301	How long has it been since you were diagnosed with hypertension?	-----Month/year	
302	How long have you been taking anti-hypertensive medications?	-----Month/year	
303	What is your frequency of follow up at this hospital?	1. Weekly 2. Every two week 3. Every month 4. Every three month 5. Every six month	

304	How often do you measure your blood pressure?	1. Daily 2. Weekly 3. Every two week 4. Every month 5. Every three month 6. Every six month	
305	Do you have any of the following disease?	1. No comorbidities 2. DM 3. CKD 4. Stroke 5. Coronary artery disease	
306	Do you think that uncontrolled BP can lead to harm on your health?	1. yes 0. no	
307	If your answer is "yes" for question No.306, which conditions can be caused by uncontrolled BP?	1.Stroke 2. Coronary artery disease 3.CK 4. DM	
308	Do you bother about the long-term treatment provided to you?	1. Yes 0. No	
309	Do you have weight loss compared to pre diagnosis weight?	1. Yes 0. No	
310	If your answer is "yes" to question No. 308, how much weight loss do you have?	____ (kg)	
311	Weight	____ (kg)	
312	Height	____ (cm)	BMI
313	Waist circumference	____(cm)	
314	Blood pressure measurement (today)	____(mmHg)	

Section IV. Knowledge of respondents regarding hypertension prevention			
No	Questions	Response/ Alternative Choices	Remark
400	You know why blood pursuer is an increased disease?	1. Yes 0. No	
401	Do you know what will happen to blood pursuer rising uncontrollability?	1. Yes 0. No	

402	Can hypertension be controlled	1. Yes 0. No	
403	What methods do you know to prevent/controlled hypertension? (more than one answer is possible)	1. Avoid smoking 2. Avoid drinking excessive amount of alcohol 3. Doing regular physical exercise 4. Consuming fruits and vegetable and reducing consumption of excess fat 5. Restricting sodium consumption	
404	Do you know How many years did blood pursuer medication have been taken?	1. Yes 0. No	
405	Do you know without anti hypertension medication to controlled blood pursuer?	1. Yes 0. No	
406	Do you have checked your own BP?	1. Yes 0. No	

ክፍል II. የባህሪ መለኪያዎች

ሲጋራዎች ይጠቀማሉ			
200	እንደ ሲጋራ ወይም ፔፓ ያሉ የሲጋራ ምርቶችን አጨስህ ታውቃለህ?	1. በጭራሽ አላጨስም 2. አሁን በሲጋራ ላይ(አሁን አጨሳለሁ) 3. ቀደም ሲልአጨስ ነበር	
201	ከዚህ ጥናት በፊት ላለፉት 30 ቀናት አጨስው ነበር?	1.አዎ 0. አይ	
202	በሳምንት ውስጥ ምን ያህል ጊዜ ያጨሳሉ?	1. በየቀኑ 2. 5-6 ቀናት 3. 3-4 ቀናት 4. 1-2 ቀናት	
203	ሲጋራ ለምን ያህል ጊዜ አጨሱ?	-----	----- አመት
204	በአማካይ በየቀኑ ስንት ሲጋራ ያጨሳሉ?	-----	----- በቁጥር)
አልኮሆል አሳግባብ መጠቀም			
205	የአልኮል መጠጥ ጠጥተህ ታውቃለህ? ("ጠላ", ጠጅ, "አራቂ", ቢራ, ወይን,)	1. በጭራሽ አይጠጡ 2. አሁን እጠጣለሁ 3. የቀድሞ እጠጣለሁ	
206	ባለፉት 30 ቀናት ውስጥ አልኮል ጠጥተዋል?	1. አዎ 0. አይ	
207	በሳምንት ውስጥ ምን ያህል አልኮል ይጠጣሉ?	1. በየቀኑ 2. በሳምንት 5-6 ቀናት 3. በሳምንት 3-4 ቀናት 4. በሳምንት 1-2 ቀናት	
208	ለምን ያህል ጊዜ ጠጣህ ነው?	_____	(በዓመት)
209	በአንድ ጊዜ ስንት ብርጭቆ/ጠርሙዝ ይጠጣሉ?(የመጠጡን አይነት ይግለጹ)	-----	መጠኑ በጽሁፍ ይገለጥ

ጫት			
210	ጫት ቅመው ታውቃለህ?	1.አዎ 0. አይ	
211	ምን ያህል ደጋግመው ቅመዋል?	1. በየቀኑ 2. በሳምንት 5-6 ቀናት 3. በሳምንት 3-4 ቀናት 4. በሳምንት 1-2 ቀናት	
212	ጫት እየቃምክ ለምን ያህል ጊዜ ቆየህ?	_____ (በአመታት ውስጥ)	
የቡና ፍጆታ			
213	ቡና ትጠጣለህ?	1.አዎ 0. አይ	
214	በሳምንት ውስጥ ስንት ቀናት ቡና ይጠጣሉ?	1. በየቀኑ 2. በሳምንት 5-6 ቀናት 3. በሳምንት 3-4 ቀናት 4. በሳምንት 1-2 ቀናት	
215	በእነዚህ ቀናት ውስጥ ስንት ሲኒ ቡና ትጠጣለህ?	1. በቀን አንድ ሲኒ በቀን 2. ሁለት ሲኒ 3. በቀን ሶስት እና ከዚያ በላይ ሲኒዎች	
አመጋገብ (የጤና አመጋገብ)			
216	በሳምንት ውስጥ ስንት ቀናት ፍራፍሬዎችን ይበላሉ?	_____ የቀናት ብዛት	
217	በእነዚህ ቀናት ውስጥ ስንት ፍራፍሬዎችን ይበላሉ?	_____ የመመገቢያዎች ብዛት	
218	በሳምንት ውስጥ ስንት ቀናት አትክልት ይበላሉ?	_____ የቀናት ብዛት	
219	በእነዚህ ቀናት ውስጥ ምን ያህል አትክልት ይበላሉ?	_____ የመመገቢያዎች ብዛት	
220	የእንስሳት ስብ (ቅቤ, የሰባ-ጮማ ሥጋ) ይበላሉ?	1.አዎ 0.አይ	

221	በሳምንት ውስጥ ስንት ቀናት የእንስሳት ስብ ጮማ ይበላሉ?	_____ የቀናት ብዛት	
222	በእነዚህ ቀናት ምን ያህል የእንስሳት ስብ ይበላሉ?	_____ የመመገቢያዎች ብዛት	
የጨው ፍጆታ			
223	በምግብዎ ውስጥ ጨው ይጠቀማሉ?	1. አዎ 0. አይ	
224	ምግብ በበቂ መጠን ጨው ከተዘጋጀ በኋላ ተጨማሪ ክላይ የተጨመረ ጨው በሳህን ላይ ትጠቀማለህ?	1. አዎ 0. አይ	
ተገዢነት አካላዊ እንቅስቃሴ			
225	የአካል ብቃት እንቅስቃሴ ታደርጋለህ?	1. አዎ 0. አይ	
226	ስራዎ ቢያንስ ለ20 ደቂቃ ያለማቋረጥ እንደ (ከባድ ሽክሞችን መሸከም ወይም ማንሳት፣ መቆፈር ወይም የግንባታ ስራ) ከፍተኛ የአተነፋፈስ ወይም የልብ ምት እንዲጨምር የሚያደርግ ኃይለኛ-ጥንካሬ እንቅስቃሴን ያካትታል?	1. አዎ 0. አይ	
227	በተለመደው ሳምንት ውስጥ ስንት ቀናት ጠንካራና የጥንካሬ እንቅስቃሴዎችን እንደ ስራዎ አካል ያደርጋሉ?	_____ ቀናት	
228	በተለመደው ቀን በሥራ ቦታ ብርቱ-ጥንካሬ እንቅስቃሴዎችን ለማድረግ ምን ያህል ጊዜ ታጠፋለህ?	_____ ሰዓታት	

ከቦታወደ ቦታዎች ጉዞ(Adherence walk)			
229	ከቦታወደ ቦታዎች ለመድረስ እና ለመሄድ በቀን ቢያንስ ለ 10 ደቂቃዎች ያለማቋረጥ ይራመዳሉ?	1. አዎ 0. አይ	
230	በተለመደው ሳምንት ውስጥ፣ ወደ ቦታዎች ለመሄድ እና ለመነሳት ያለማቋረጥ ቢያንስ ለ10 ደቂቃ ያህል ለስንት ቀናት ይራመዳሉ?	_____ ቀናት	
231	በተለመደው ቀን ለጉዞ በእግር ለመጓዝ ምን ያህል ጊዜ ያሳልፋሉ?	_____ ሰዓታት _____ ደቂቃ	
232	ከቦታ ቦታ ሄዳችሁ ለመምጣት ምን ትጠቀማላችሁ?	1. በእግር 2. ብስክሌት 3. ተሽከርካሪ በመጠቀም ሞተር	
የመዘናኛ እንቅስቃሴዎች			
233	ቢያንስ ለ10 ደቂቃ ያለማቋረጥ ከፍተኛ የአተነፋፈስ ወይም የልብ ምት እንዲጨምር የሚያደርጉ ጠንካራ-ጠንካራ ስፖርቶች፣ የአካል ብቃት ወይም የመዘናኛ (የመዘናኛ) እንቅስቃሴዎችን ያደርጋሉ?	1. አዎ 0. አይ	
234	በተለመደው ሳምንት ውስጥ ለስንት ቀናት ያህል ኃይለኛ-ጠንካራ ስፖርቶችን፣ የአካል ብቃት ወይም የመዘናኛ (የመዘናኛ) እንቅስቃሴዎችን ታደርጋለህ?	_____ ቀናት	
235	ጠንካር ያሉ ስፖርቶችን፣ የአካል ብቃትን ወይም የመዘናኛ እንቅስቃሴዎችን በተለመደው ቀን ምን ያህል ጊዜ ታጠፋለህ?	_____ ደቂቃ	

ከመድኃኒት ጋር ተያያዥነት ያላቸው ጥያቄዎች			
ቁጥር	ጥያቄ	አዎ	አይ
236	አንዳንድ ጊዜ ክሊኖችዎን መውሰድ ይረሳሉ?		
237	ሰዎች አንዳንድ ጊዜ መድሃኒቶቻቸውን ከመርሳት ውጪ መውሰድ ያመልጣሉ። ላለፉት ሁለት ሳምንታት በማሰብ ፣ እዚያ ነበሩ		
238	መድሃኒትዎን ሲወስዱ በጣም ስለተሰማዎት ለሐኪምዎ ሳይናገሩ ቆርጠህ ታውቃለህ?		
239	ሲጓዙ ወይም ከቤት ሲወጡ አንዳንድ ጊዜ መድሃኒትዎን ይዘው መምጣት ይረሳሉ?		
240	ትላንትና ሁሉንም መድሃኒት ወስደዋል?		
241	ምልክቶችዎ በቁጥጥር ስር እንደሆኑ ሲሰማዎት አንዳንድ ጊዜ መድሃኒትዎን መውሰድ ያቆማሉ?		
242	በየቀኑ መድሃኒት መውሰድ ለአንዳንድ ሰዎች እውነተኛ ችግር ነው። ከህክምና እቅድዎ ጋር ስለመጣበቅ ተቸግረው ያውቃሉ?		
243	ሁሉንም መድሃኒት መውሰድዎን ለማስታወስ ምን ያህል ጊዜ ይቸገራሉ?		

ክፍል III: የታካሚዎች ክሊኒካዊ ባህሪያት			
. የትብብር በሽታ ታሪክ (History of co-morbidity)			
300	የቤተሰብ የደም ግፊት ታሪክ አለዎት?	1. አዎ	0. አይ
			አስተያየት
301	በምርመራ ከተረጋገጠ ምን ያህል ጊዜ አልፏል ከደም ግፊት ጋር?	---- ወር / ዓመት	

302	ፀረ-ከፍተኛ የደም ግፊት መድሃኒቶችን ምን ያህል ጊዜ እየወሰዱ ነው?	---- ወር / ዓመት	
303	በዚህ ላይ የእርስዎ የመከታተያ ድግግሞሽ ምንድነው? ሆስፒታል?	1. በየሳምንቱ 2. በየሁለት ሳምንቱ 3. በየወሩ 4. በየሁለት ወሩ 5. በየሶስት ወሩ 6. በየስድስት ወሩ 7. ሌላ (ይግለጹ) ---	
304	ደምዎን ምን ያህል ጊዜ ይለካሉ ግፊት?	1. በየቀኑ 2. በየሳምንቱ 3. በየሁለት ሳምንቱ 4. በየወሩ 5. በየሁለት ወሩ 6. በየሶስት ወሩ 7. በየስድስት ወሩ 8. ሌላ (ይግለጹ)	
305	ከሚከተሉት በሽታዎች ውስጥ አንዳቸውም አለዎት?	1. ምንም ተጓዳኝ በሽታዎች የሉም 2. የስኳር በሽታ 3. ሲ.ዲ.ዲ 4. ስትሮክ 5. የደም ሀይል ደም ወሳጅ ሀይሎች በሽታ 6. ሌሎች (ይግለጹ) ---	
306	ከቁጥጥር ውጭ የሆነ የደም ግፊት በጤናዎ ላይ ጉዳት ሊያደርስ ይችላል ብለው ያስባሉ?	1. አዎ 0. አይ	

307	ለጥያቄ ቁጥር 306 መልስዎ "አዎ" ከሆነ በየትኞቹ ሁኔታዎች ሊከሰቱ ይችላሉ ቁጥጥር ያልተደረገበት የደምግፊት?	1. ስትርክ 2. የደም ቧንቧ ቧንቧበሽታ 3. ሲ.ዲ.ዲ 4 ዲኤም 5. ሌሎች (ይጥቀሱ)	
308	ስለ የረጅም ጊዜ ሕክምናው ይጨነቃሉ ለእርስዎ የቀረበ?	1. አዎ 0. አይ	
309	ክቅድመ-ክብደት መቀነስ አለብዎት የምርመራ ክብደት?	1. አዎ 0. አይ	
310	ለጥያቄ ቁጥር 308 መልስዎ "አዎ" ከሆነ እንዴት ብዙ ክብደት መቀነስ አለብህ?	_____ (ኪግ)	
311	ክብደት	_____ (ኪግ)	
312	ቁመት	_____ (ሴሜ)	
313	የወገብ ዙሪያ	_____ (ሴሜ)	
314	የደም ግፊት መለኪያ (ዛሬ)	_____ (mmHg)	
315	የራስዎ የ BP መቆጣጠሪያ መሳሪያ አለዎት?	1. አዎ 0. አይ	
ክፍል IV. የደም ግፊት መከላከልን በተመለከተ ምላሽ ሰጪዎች እውቀት			
ቁጥር	ጥያቄዎች	ምላሽ/አማራጭዎች	አስተያየት
400	ደም ግፊት በሽታ እየጨመረ የሚሄድ በሽታ እንደሆነ ታውቃልህ?	1. አዎ 0. አይ	
401	ከቁጥጥር ውጭ በሆነ ሁኔታ ላይ ደም ግፊት ምን እንደሚሆን ታውቃልህ?	1. አዎ 0. አይ	
402	የደም ግፊትን መቆጣጠር ይቻላል	1. አዎ 0. አይ	
403	የደም ግፊትን ለመከላከል/ለመቆጣጠር ምን ዘዴዎች ያውቃሉ? (ከአንድ በላይ መልስ ይቻላል)	1. ማጨስን ያስወግዱ 2. ከመጠን በላይ መጠጣትን ያስወግዱ/የአልኮል መጠን	

		<p>3. መደበኛ የአካል ብቃት እንቅስቃሴ ማድረግ</p> <p>4. ፍራፍሬዎችን እና አትክልቶችን መጠቀም እና ፍጆታን መቀነስ ከመጠን በላይ ስብ</p> <p>5. የሶዲየም ፍጆታን መገደብ</p> <p>6. ሌላ፣ ይግለጹ_____</p>	
404	ያለ ደም ግፊት መድሃኒት ሚቆጣጠር እንደሚቻል ታውቃለህ?	1 አዎ 0 አይ	