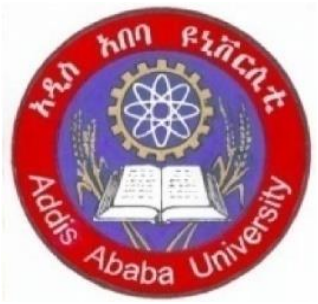

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH

RAISED BLOOD PRESSURE MAGNITUDE AND ASSOCIATED FACTORS AMONG PREVIOUSLY UNDIAGNOSED ADULT OUTPATIENT ATTENDANTS IN TIRUNESH BEIJING GENERAL HOSPITAL, ADDIS ABABA, ETHIOPIA.

BY

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A THESIS SUBMITTED TO SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES, SCHOOL OF PUBLIC HEALTH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH.

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ABBREVIATIONS

AOR	Adjusted Odds Ratio
BMI	Body Mass Index
CI	Confidence Interval
COPD	Chronic Obstructive Pulmonary Disease
COR	Crude Odds Ratio
CRD	Chronic Respiratory Disease
CVD	Cardiovascular Disease
DALYs	Disability Adjusted Life Years
DBP	Diastolic Blood Pressure
DM	Diabetes mellitus
ENT	Ear, Nose, and Throat
ETB	Ethiopian Birr
GMF	(WHO NCD) Global Monitoring framework
HEARTS	**H**ealthy lifestyle, **E**vidence based treatment protocols, **A**ccess to essential medicines, **R**isk based management, **T**eam-based care, and **S**ystems for monitoring
LMIC	Lower and Middle Income Countries
NCD	Non-communicable Disease
NCDIs	Non-communicable Disease and Injuries
OOP	Out-of-Pocket
OPD	Outpatient department
SARA	Service Availability and Readiness
SBP	Systolic Blood Pressure
SSA	Sub-Saharan Africa
WHO	World Health Organization
STEPS	Stepwise approach to Surveillance

ABSTRACT

Background: Globally hypertension is one of major public health problem affecting 972 million people. The prevalence of hypertension in Ethiopia is estimated to be 16% in 2015. But vast majority (76.6%) of hypertension patients in Ethiopia never measured their blood pressure. Furthermore, large number of patients visited traditional healers.

Objectives: The study examined the magnitude and associated factors of raised blood pressure among previously undiagnosed adult outpatient attendants in Tirunesh Beijing General Hospital, 2020.

Methods: The study employed an institution-based cross-sectional study design. A total of 408 study participants were included and selected by using systematic random sampling technique. Data were collected by using a pretested structured questionnaire. Descriptive statistics analyses such as frequency and cross tabulation were calculated to measure the magnitude for selected variables versus the magnitude of raised blood pressure. Binary logistics regression was used to examine the possible risk factors for raised blood pressure and risk factors with p-value < 0.2 were included in the multivariable logistic regression model. Statistical significance was determined at P-value < 0.05. The data was processed in Epi Data v3.1 and analyzed in SPSS v26.

Results: The respondents age ranged from 18 to 80 years and nearly half (49%) of them were male. The mean systolic and diastolic blood pressures were 125.61 millimeters of Mercury (mmHg) (14.25 SD) and 76.77 mmHg (8.82 SD), respectively. The prevalence of raised blood pressure was 18.6%, 95% CI (15, 22.3). Age >50 years (AOR=7.7, 95% CI:2.8,21.4), age 30 to 49 (AOR=3.3, 95% CI: 1.4, 7.7), smoking (AOR=6.1, 95% CI:2.6-14.3), alcohol consumption (AOR=2.4, 95% CI:1.3-4.3), salt intake (AOR=2.1, 95% CI: 1.1-3.9), and body mass index (BMI) (AOR=2.5, 95% CI:1.2,5.3) were statistically significant risk factors for raised blood pressure in adults.

Conclusion: This study indicated that raised blood pressure was a major health burden. The study identified risk factors for raised blood pressure in adults, and most are modifiable. Hence, stakeholders may use the finding to develop preventive and control strategies to decrease the burden of raised blood pressure.

1. INTRODUCTION

1.1. Background

Globally, 41 million people died every year due to non-communicable diseases (NCD) and 15 million of the deaths occur between the ages of 30 and 69. Notably, 85% of the premature deaths are from low- and middle- income countries (LMICs). Based on the world health organization (WHO) Non-communicable diseases country profiles 2018, of all NCD deaths, cardiovascular diseases (CVD) account for 17.9 million, cancers for 9 million, chronic respiratory diseases (CRD) for 3.9 million and diabetes for 1.6 million deaths .And for CVD-related deaths hypertension accounted for 9.4 million(1).

In May 2013 the 66th World Health Assembly adopted the comprehensive global monitoring framework (GMF) for the prevention and control of non-communicable diseases with a purpose of detailed guidance to Member States to correctly measure each of 9 targets and 25 indicators. And for 2025: a 25% relative reduction in risk of premature mortality from cardiovascular diseases and a 25% relative reduction in the prevalence of raised blood pressure were among the targets(2).

Hypertension is an important risk factor for several diseases such as cardiovascular diseases, stroke, coronary heart disease, congestive heart failure, peripheral arterial disease and renal failure. High blood pressure kills more people than any other condition – and more than all infectious diseases combined (3). For every increase in 20 mmHg systolic or 10 mmHg diastolic blood pressures the lifetime risk of heart disease doubles (4).

Globally, 40% of people over 25 years of age have high blood pressure and an estimated 972 million (26%) people have hypertension, and the prevalence is expected to increase to 29% by 2025. Now a day, the prevalence of hypertension increasing in low- and middle-income countries; where 1 in 5 of the adult population has the condition. By 2025, it was estimated almost 3 out of every 4 people with hypertension will be living in low and middle income countries (5).

The prevalence of hypertension has increased over the past three decades. In Sub-Saharan Africa, approximately 80 million adults live with hypertension in the year 2000 and this figure will rise to 150 million by 2025. A study in Sub-Saharan Africa countries (SSA) indicated that the prevalence of hypertension was 25.9% with large disparities based on their

place of residence. Surprisingly, 50% of cases with hypertension were not aware of their raised blood pressure (6).

In Ethiopia, according to the national WHO Stepwise approach to Surveillance (STEPs) survey report the prevalence of hypertension in adults was 16% (22% urban versus 13% rural) in 2015 (7). According to the Non-communicable disease and injuries (NCDI) commission report in Ethiopia hypertension was a major risk factor in 69.3% of stroke patients in Tikur Anbessa Specialized Hospital. And in Jimma Hospital, hypertension with hypertensive heart disease is second most common diagnosis in the cardiac clinic of the hospital (8).

Based on the Global Burden of disease report 2019 in Ethiopia, 57% of the deaths were attributable to one or more of behavioral risk factors, metabolic risk factors and environmental/occupational risk factors; and 50% of the disability adjusted life years (DALY) lost was attributable to the above known risk factors. Of all deaths the same year, high systolic blood pressure, dietary risks, alcohol use, tobacco smoking and high body mass index (BMI) accounted for 7.5%, 6%, 3.5 %, 2.7% and 1.8% deaths respectively and from dietary risk factors diet high in sodium, diet low in fruits and diet low in vegetables contribute 1.4 %, 1.4 and 0.9% of the deaths, respectively (9).

Ethiopia has recognized the danger of the looming burden of non-communicable diseases. The national NCD program was established in 2013, with incorporation of Hypertension an NCD Prevention and control strategic plan and a national NCD guideline were developed in 2014 and 2016 respectively. Evidences were gathered through the National WHO NCD STPES survey in 2015, prevalence of hypertension and associated factors was also included as study variables' (7). The national NCDI Commission was established in collaboration with Harvard University and University of Burgen in 2016 and produced its report in 2018. The NCDI Commission report summarized the burden of NCDIs with incorporation of hypertension and risk factors in Ethiopia, identified key gaps and challenges in the current delivery of services and undertaken a priority setting exercise to identify cost effective and equitable interventions (8).

1.2. Statement of the problem

Hypertension is one of the priority areas the Ministry of Health is focusing on, and an integrated decentralized hypertension prevention and care is being implemented. In 2020,

only 2,509,921 individuals were screened for hypertension (10). However, the rate of screening and enrollment to care is still extremely low. There are more than 30 million eligible individuals awaiting screening for hypertension (11).

In Ethiopia, different studies indicate that 76.6% of hypertensive patients never measured their blood pressure before. About 18.7% of rural and 7.5% urban hypertensive cases visit traditional healers and also 14.1% rural and 5.5% urban hypertensive patients were taking herbal or traditional medicines. Similarly, 60% of those with high blood pressure were never diagnosed as having hypertension. Among those cases identified as having raised blood pressure, only 28.4% were taking medications. Despite medications and follow-up, majority of patients 74% had poorly controlled hypertension (8).

Previous community-based and facility-based studies on hypertension and risk factors had several limitations. The age range studied was often older individuals and studies included those already diagnosed with hypertension. Many of the studies were conducted several years ago and may not reflect the current socio demographic situation. Hence, they lacked rigor for policy makers to recommend routine screening for hypertension at facility level. And, since the STEPS survey was conducted some years back and other studies are sparse additional studies are needed to fill the information gap especially on association between risk factors and hypertension (8).

So, the aim of this study primarily focuses on alarming hospital leaders and managers on the burden of raised blood pressure and associated factors in order to give more attention to prevention and control of raised blood pressure and associated factors. Also help health professionals working at hospitals to focus on health promotion, screening, early diagnosis, and primary prevention of hypertension targeting risk factors and management of hypertension

1.3. Rationale of the study

Since community awareness and the priority given to its prevention and control by the communities and government is very low in Ethiopia, additional evidence on prevalence of raised blood pressure and its risk factors are needed.

According to the Ethiopia Service Availability and Readiness Assessment (SARA) 2016 survey report, there was lack of well-trained staff to provide quality care for hypertensive

patients. Also, majority of health facilities had no healthy life style counseling service and provided limited hypertension screening service. As a corollary to the finding mentioned, it is expected that there will be a limited access to hypertension screening treatment service due to un readiness of the health facilities (12).

This study tried to estimate the existing magnitude and determine associated factors of raised blood pressure. The findings from this study will help to inform policy and decision makers to take relevant actions based on evidence. In so doing, the study is anticipating to contribute to designing better intervention strategies/programs on prevention and control of raised blood pressure. Moreover, the study adds to the existing body of knowledge on raised blood pressure and associated factors.

2. LITERATURE REVIEW

2.1. Non-communicable disease in Ethiopia

Different evidences indicated Ethiopia faces a triple burden of diseases which includes the already existing infectious diseases, increasing burden of non-communicable Diseases and injuries. World Health Organization indicated there were a total of 700,000 deaths in Ethiopia in 2016. Among these deaths 39 % was attributed to NCDs in which cardiovascular diseases accounted for 16% of all causes of death. According to NCDI Commission report 52% of deaths in 2016 occurred from NCDs and injuries and 46.1% of DALYs lost in Ethiopia were from NCDIs. More than half (51%) of the NCDI mortality occurred before age 40; 63% mortality occurred before age 50 and 70% before age 70 (8).

According to systematic review on community and hospital-based studies on NCDs in Ethiopia, prevalence of CVDs was 7.2%, and it was highest in Addis Ababa while 24% deaths were attributed to CVDs. Hospitalization from CVD was 3% in Amhara and 12.6% in Oromia and also the prevalence of CVD has been increasing over time among hospitalized patients ranging from 4.4% in 1970s to12.6% in 2005 (13).

According to SARA Survey in 2018, even though 49%, 48%, 53% and 9% of health facilities claimed to provide diagnosis and management of CVD, DM, CRD and Cervical Cancer respectively, the mean availability of tracer items for the above services was only 42%, 48%, 27% and 52% respectively indicating that almost half of the facilities which reported delivering an NCD service were not well prepared to do so (12).

23% of total out of pocket (OOP) expenditures in Ethiopian households were due to NCDs in which renal failure accounts for 10%. Among CVD patients in Addis Ababa who visit health facilities 27% had experienced catastrophic health expenditures (8).

2.2. Magnitude of Hypertension

Globally, one in four men and one in five women of age 18 years and above had raised blood pressure in 2015. However, prevalence of hypertension is lower in high income countries (18%) as compared to low-income countries (28%). A pooled meta-analysis of 1670 studies in 71 countries with 29.5 million participants indicated that the prevalence of hypertension ranges from 4% to 78% (14).

High blood pressure was reportedly almost non-existent in African societies in the first half of the twentieth century. There were approximately 80 million adults with hypertension in sub-Saharan Africa in 2000 and projections based on current epidemiological data suggest that this figure will rise to 150 million by 2025. The WHO STEPS survey report in 2015 from 31 African countries indicated the prevalence ranging from 17% to 40%. The evidence, additionally, indicated that related complications of hypertension in particular stroke and heart failure are also becoming increasingly more common in this region. These trends have been strongly linked with changes in individual and societal lifestyle such as an increase in tobacco use, excessive alcohol consumption, reduced physical activity and adoption of "Western" diets that are high in salt, refined sugar and unhealthy fats and oils (5,15).

A different study in Sub Saharan Africa (SSA) indicated a prevalence of 16.2% with an estimated 74.7 million individuals with hypertension in 2013 which varies from country to country and the number affected will increase by 68% (125.5 million) by 2025. Mass migration of rural people to urban and rapid changes in lifestyle is the underlying risk factors for the rising prevalence of hypertension. Another research finding from Kenya showed that the prevalence of hypertension was 24.5%. Among individuals with hypertension only 15.6% were aware of their elevated blood pressure and among those that are aware only 26.9% were on treatment (16,17).

Different community-based studies from different areas at different times on the burden of hypertension in Ethiopia have shown different results. In 2017, a community based cross-sectional study in Ethiopia indicated that the prevalence of hypertension was 28.3% among adult study participants. The same study on North West Ethiopia indicated 27.9% of study participants had hypertension and the proportion was 30.7 among urban study subjects. In 2013 another study had done in Ethiopia state the prevalence of hypertension 22% among men and 14.9% among women (18–20). The study finding from Bedele Town revealed that the prevalence of hypertension was 16.9%. Another study finding from Durame showed that the prevalence of hypertension was 22.4%. Similar study done in Dire Dawa City has revealed the prevalence of hypertension to be 24.43% (21–23). According to research finding from a study on adult population in Northern Ethiopia, 18.1% had hypertension and 22.5% had pre-hypertension among study participants, with variation in urban and rural residents as well as in male and female. And results from a study done in Addis Ababa showed that out of 3273 study participants, 31.5% of males and 28.9% of females had high blood pressure

(24,25). In Ethiopia, according to a systematic meta-analysis study in 2020, the adult hypertension prevalence was 19.6 % (26).

Research conducted in different civil servants' institutions in different places and times also showed different results. According to a study done in Federal Ministry of Civil Service in Addis Ababa among 629 study subjects 27.3% had hypertension; of which 28.3% were females and 26.2% were males. Similar study done on public servants in Tigray Region indicated that among 1523 respondents 16% had hypertension. However, nearly half of respondents had ever been notified that their blood pressures were raised (27,28).

Different Facility based studies done in our country also indicated that there is high prevalence of hypertension. A hospital based cross-sectional study done in Addis Ababa in Yekatit 12 Hospital in 2015 was 34.7% (29). According to Cross-sectional Study in Jimma University Specialized Hospital, 13.2% had hypertension during measurement or had history of hypertension among 734 study subjects, of which only 23.2% knew that they had hypertension (30). And another study in Felege-Hiwot Comprehensive referral Hospital showed that the prevalence of hypertension was 27.3% (31).

2.3. Factors Associated with Hypertension

Hypertension is mainly associated with environmental and lifestyle factors rather than with genetics and has a stronger association and causal link with tobacco use, excessive use of alcohol, physical inactivity, unhealthy diet (high salt intake and, insufficient fruit and vegetable consumption) and obesity (5). However, the risk factors for hypertension are multifactorial. There are modifiable and non-modifiable risk factors.\

2.3.1. Non modifiable associated factors

2.3.1.1. Age

The older you are, the more likely you are to get high blood pressure. As we age, our blood vessels gradually lose some of their elastic quality, which can contribute to increased blood pressure. However, children can also develop high blood pressure (32).

In Africa, a study on Moroccan adults indicated age was significantly associated with hypertension (33). And the study finding from four-country of sub-Saharan Africa showed that the prevalence of hypertension were significantly higher among participants aged 50

years or older compared to those aged 18 – 29 years (6) Research finding from showed that respondents older than 50 years old were significantly more than 5 times likely to be hypertensive compared to those aged 18–24 years (17) . Another community based study in Uganda revealed that increasing age was associated with hypertension which age ≥60 years was associated with a marked elevation in hypertension prevalence compared to age 18–29 years (34).

A community based study in North West Ethiopia showed when a person got older by one year, the odds of hypertension occurrence increased by 6% (18) .A Study in Bedele Town showed nearly two-third of those 55 years or older participants had hypertension (21) . Research findings from Jimma University Specialized Hospital on associated factors with hypertension showed that hypertension increases with age (30) . Community based study in Addis Ababa indicated, the odds of hypertension increased almost three times among respondents aged 30–49 years, and eight times higher among respondents aged 50 years and above as compared to those 18–22 years old (35).

In study finding from Dire Dawa city hypertension was significantly associated with old age which the prevalence was lowest, (7.33%) among adults 25-29 years-old and the highest, (40.53%) was observed among those 55-64 years-old (22). According to study finding from public servants in Tigray, Employees in the age groups of 30–49 years were two to four folds more likely to develop hypertension than those in the age group of 18–29 years (27). Study finding from Debre Markos Town participants who had an age greater than 50 years were 3.31 times more likely to develop hypertension(36).

2.3.1.2. Gender

According to report from 6th session of the African Union Conference of Ministers of health on NCD's, in comparison to countries like Ethiopia and Tanzania where showed the general trend of males having higher prevalence than females (5). A study on Moroccan adults indicates hypertension is more prevalent in women than men (33). And a study in Senegal indicates hypertension was highly prevalent in females than males (37). A community based study in revealed that gender was associated with hypertension which men were 1.3 times more likely to have hypertension than women (34).

According to community based studies on associated factors among adults in Ethiopia, male were 2.4 times more likely to be hypertensive when compared to those female (19). A study

report from Northern Ethiopia revealed, In urban residents 22.5% of males and 19.0% of females were found to be hypertensive (24). Study in Debre Markos Town showed that Being female was 3.8 times more likely to develop Hypertension (36) and on the other hand, study finding from public servants in Tigray indicated the likelihood of being hypertensive was two times more likely higher among male compared to their counterparts (27) . According to research finding from community based study in Addis Ababa, the odds of hypertension were twice as high in men compared with women (35).

2.3.1.3. Family history

Research finding from Kenya showed that family history was associated with hypertension (17). According to community-based studies on associated factors among federal ministry civil servants in Addis Ababa, having family history of hypertension was significantly associated with hypertension (28). Research findings from Jimma University Specialized Hospital on associated factors with hypertension showed that hypertension increases with family history which Family history of hypertension was reported in 24 (3.3%) of the participants, and in 19.6% of those with hypertension (30). Study finding from Durame Town indicated participants who had family history of hypertension were found to be significantly at higher risk of hypertension (23).

2.3.2. Modifiable associated factors

2.3.2.1. Alcohol use

Alcohol increase stimulation of sympathetic nervous system with insulin resistance and inhibition of vascular relaxing which leads to hypertension (4).

Research finding from Kenya showed that consuming harmful amounts of alcohol were 1.54 times more likely to be hypertensive. Another community based study in Uganda revealed that men consuming ≥10 alcoholic drinks per month had 60% higher prevalence of hypertension compared to non-drinkers (17,34).

According to facility based study in Felege-Hiwot Comprehensive Referral Hospitals, Hypertension was more prevalent in alcohol users (31). According to community based studies in Debre Markos Town, North West Ethiopia showed Alcohol consumers were 3.17 times more likely to develop hypertension than the counterparts (36).

2.3.2.2. Smoking

Tobacco smoking is known to increase the risk of developing hypertension and cardiovascular diseases like stroke, Thrombosis and heart attack. Smoking causes an immediate increase in blood pressure resulting in higher ambulatory blood pressure Levels for smokers than for non-smokers. Smoking cessation is known to reduce the overall risk of cardiovascular diseases and daily smokers represented a greater proportion of actual smokers and were disproportionately male (5) .

The study finding from a four country from sub-Saharan Africa the prevalence of hypertension was significantly higher among participants reporting to use tobacco, compared to those reporting to had never used tobacco (6). Data from a population-based, cross-sectional survey in Saint Louis, Senegal indicated Hypertension was more frequent in the case of a past history of smoking and passive exposure (37). And finding from Moroccan adults study, smoking was present in 25.5% of males and 1.8% of females (33).

According to study finding from community based study from Dire Dawa City, the prevalence of hypertension was higher among lifetime smokers (22) .And finding from federal Ministry civil servants in Addis Ababa, Past or present cigarette smokers are 2.34 times more Likely to have hypertension as compared to non-smokers (28). Study in Bedele Town showed that smoking was associated with high blood pressure (21).

2.3.2.3. Excess salt intake

Excess dietary salt (the active component of which is sodium) is the most important modifiable risk factor for hypertension. Sodium attracts water and high-sodium diet draws water into the bloodstream, which increases the volume of blood and over time can increase your blood pressure (3) .

A high intake of sodium is common, in Africa mostly from salt used to preserve food or to make it tastier. Decreased salt intake not only reduces blood pressure and related CVD risk, but has other beneficial cardiovascular effects that are independent of and additive to its effect on blood pressure (5).

According to study done in Durame Town, Southern Ethiopia, participants who use top added salt on plate, they were more likely to be hypertensive than their counter parts (23). According community based study in Debre Markos Town, excess salt consumption is significant factors of hypertension (36).

2.3.2.4. Over weight and obesity

The World Health Organization (WHO) defines obesity as a condition in which excess body fat has accumulated to such an extent that health may be adversely affected. Obesity greatly increases the risk for hypertension and has also been shown to be associated with coronary artery disease and some cancers and to reduce life expectancy (5).

According to study finding from a four-country from sub-Saharan Africa, the prevalence of hypertension was significantly higher among participants with BMI between 25 to 29.9 kg/m2 compared to those with BMI less than 25, and even higher among the obese (BMI ≥ 30 kg/m2) participants (6). Research finding from Kenya showed that overweight and obese respondents were close to two and three times more likely to be hypertensive as compared to normal weight individuals. Another community based study in Uganda revealed that overweight and obese women were more likely to be hypertensive (17,34).

According to community based studies on associated factors among adults in Ethiopia, those who had BMI ≥ 25 were two times more likely to be hypertensive when compared to those who had BMI < 25 (19). Similar study in North West Ethiopia showed that on average a one unit increase in BMI led an increase of 7% on the occurrence of hypertension (18) (18,19). Study in Bedele Town showed that high waist circumference was associated with high blood pressure. Similar study in Durame overweight or obesity was found to be a strong risk factor for hypertension (21,23). According study done on federal ministry civil servants in Addis Ababa study participants who were overweight/obese were 7.36 times more likely to be hypertensive as compared to those who had normal BMI (28) . And study done on public servants in Tigray indicated that obese respondents were more than three at increased risk of being hypertensive compared with respondents with normal BMI (27).

Research findings from Jimma University Specialized Hospital on associated factors with hypertension showed BMI over 25 is a strong predictor of hypertension(30) . and according to study done in Yekatit 12 hospital, the odds of hypertension being more than four-, fve- and three times higher among respondents whose BMI ranged from 18.5 to 24.9, 25.0 to 29.9 and greater than 30.0 compared to whose BMI was less than 18.5 (29). Similarly study finding from Felege-Hiwot Comprehensive Referral Hospitals showed Abdominal obesity was the main risk factor to develop hypertension (31).

2.3.2.5. Physical inactivity

Adequate physical activity has been shown to have many health promoting effects and has a direct, independent role in reducing hypertension (3).

In Africa, a study on Moroccan adults and data from a population-based, survey in Saint Louis, Senegal, indicated physical inactivity were significantly associated with hypertension(33,37).

Study in Bedele Town showed that physical inactivity was associated with high blood pressure. Similar study in Durame participants who did not walk for at least 10 minutes continuously on daily basis were about eight times more likely to be hypertensive (21,23). Study done in yekatit 12 Hospital indicated respondents who did not physical exercise were 2.83-times more likely to have hypertension compared to those who did physical exercise (29).

2.4. Conceptual framework

The Conceptual framework was based on previous literature that socio-demographic factors predispose to behavioral and metabolic factors and also directly contribute to raise blood pressure (4, 32). In this study the relevant variables in each category were collected using validated tools and the association was computed following statistical tests.

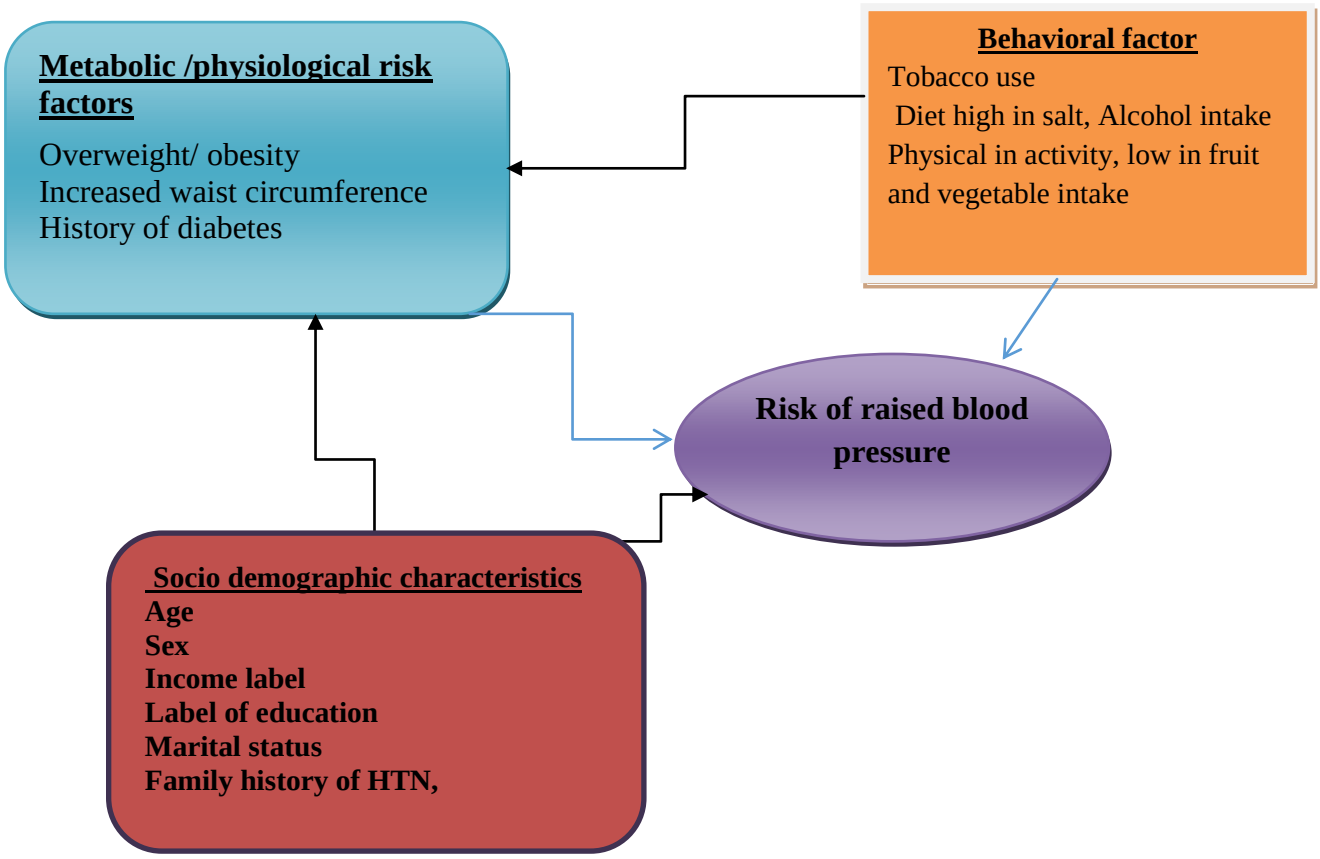

Figure 1: Conceptual framework

3. OBJECTIVES

3.1. General objectives

To assess the magnitude and associated factors of raised among previously undiagnosed adult outpatient attendants in Tirunesh Beijing General Hospital.

3.2. Specific objectives

- To determine the magnitude of raised blood pressure among previously undiagnosed adult hospital outpatient attendants in Tirunesh Beijing General Hospital, 2020.
- To identify associated factors of raised blood pressure among previously undiagnosed adult hospital outpatient attendants in Tirunesh Beijing General Hospital, 2020.

4. METHODS

4.1. Study Area and period

The study was conducted at Tirunesh Beijing General Hospital from October to November 2020. This hospital found in Akaki Kality Sub City, Addis Ababa with a catchment population of over 1.2 million. The hospital serves urban and semi-urban population from Addis Ababa City administration and Oromia Regional State.

Tirunesh Beijing Hospital is a General Hospital with 13 outpatient departments giving service for over 910 outpatient clients daily and has 113 beds capacity. The hospital provides obstetrics, pediatrics, internal medicine, gynecology, and ENT and surgery services as has been shown the hospital's annual plan. The hospital also provides mental and neurological treatment and care; cervical cancer screening, diagnosis, and treatment; COPD and diabetes diagnosis and treatment and hypertension screening, diagnosis, and treatment. The hospital serves around 3000 hypertensive patients on chronic follow up and around 60 new hypertensive patients enrolled to treatment and care every quarter.

4.2. Study Design

An institutional based cross-sectional study was conducted in Tirunesh Beijing General Hospital Akaki Kality sub city, Addis Ababa, October-November 2020.

4.3. Sources and study Population

4.3.1. Sources Population

The source population was all adult patients visiting outpatient department of Tirunesh Beijing hospital for health service.

4.3.2. Study Population

The study population was patients who were attending the medical outpatient department in Tirunesh Beijing hospital.

4.4. Eligibility Criteria

4.4.1. Inclusion Criteria

Adults who were attending medical outpatient department and who were 18 years and above and were not previously diagnosed with hypertension.

4.4.2. Exclusion Criteria

Non volunteers for the study and severely ill patients were excluded from this study.

4.5. Sample size

4.5.1. Sample size for the first objective (magnitude of hypertension)

The required sample size for the first objective was determined using single population proportion formula by considering the following assumptions.

- P: 34.7%, prevalence of hypertension according to facility-based study conducted in Addis Ababa, 2015 (29).
- d: 5 %, Margin of error or level of precision or maximum error to commit
- Zα/2: 1.96, Critical value at 95% confidence interval
- n: Required sample size

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

  $n= (1.96)^2 * 0.347* (1-0.347) / (0.05)^2 = 348$

- Non-response rate 10% = 35kn

  And the final sample size for the first objective was **383**

4.5.2. Sample size for the second objective (associated factors of hypertension).

The required sample size for the second objective was calculated using double population proportion formula by using Epi Info Version 7.2.4.0 software, using significant associated factors from different articles

Table 1: Calculation of required sample size for the second specific objectives for study done in Tirunesh Beijing General Hospital, Addis Ababa, Ethiopia, 2020.

S. N	Variable name	Power (P)	CI	Ratio	OR	Exposed	Non-exposed	Sample size	When 5% non-response added	Reference
1	Harmful use of alcohol	80%	95%	1:1	2	38.7	24	338	372	(31)
2	Smoking	80%	95%	1:1	2	35.4	21.48	358	394	(28)
2	Overweight or obesity	80%	95%	1:1	1.9	41.3	27.22	372	**408**	(19)

Since the sample size for the second specific objective is higher than the sample size for the first specific objective, the sample size for the second specific objective i.e. **408** was taken as a sample size for this study.

4.6. Sampling Technique

There were four adult outpatient departments in Tirunesh Beijing hospital (TBH) for services to general medical condition. Since the patient card is distributed to each adult outpatient departments randomly two adult outpatient departments were selected by lottery method. Study participants were selected by systematic random sampling technique. Through this process Multi stage sampling technique also applied. By using outpatient department (OPD) abstract registration book as the sampling frame; the two OPD provide service for 60 patients per day in average and 1200 patient for 20 working days. Assuming this, a sampling interval was determined the 1st study participant selected by lottery method which is the second registered patient on Out Patient Department (OPD) abstract register. Starting from that every 3rd patient registered was recruited for interview based on their willingness and eligibility to participate in the study until sample size of 408 reach.

4.7. Data collection procedures and data collection tools.

There was a two days training for data collectors. Data collectors were clinical nurses who were trained on standard blood pressure (BP) measurement with practical demonstrations. The data collector was requested to read the consent carefully to participants to get informed verbal consent before they were enrolled into the study.

Data was collected using a structured interview questionnaire and physical measurements which was adapted from "WHO STEPS" tool that contained socio-demographic characteristic, modifiable and non-modifiable risk factors for hypertension, and physical measurements (body weight, height, waist circumferences) (38).

All the questionnaires were translated from English into Amharic and back translated to English for consistency. The questionnaires were pretested on 5% of the study participants at Zewditu memorial hospital and further modifications were made.

Data was collected through a face-to-face interview technique using a combination of a structured questionnaire and measurements of the Height, weight and waist circumference of patients were done. Data was collected from individual participants at the exit point from both OPD.

4.7.1. Blood Pressure Measurement Procedure

Blood Pressure was measured following the International Society of Hypertension guidelines (32). Procedurally blood pressure was measured using adult size automatic Omron sphygmomanometer with patient appropriate sitting position. Have the patient sitting comfortably with their back supported, their feet uncrossed and flat on the floor. The 1st measurement was taken after the patients rests for at least 5 min but if client is smoking or consuming any caffeine containing beverage, we measure BP by considering the time effect for 30 min and 2nd measurement at least 1-2 minute apart from 1stmeasurement. If the BP reading difference between two measurements is less than 10 mmHg, we were take the 2nd reading. But if the difference is greater than 10 mmHg, we were taking a 3rd measurement as the last reading. Finally, Study participants who were found to have raised blood pressure and those identified with risk factors were linked to respective medical OPDs.

4.7.2. Weight, Height and Waist circumference Measurement Procedure

Weight, Height and Waist circumference was measured following the National Diabetes training manual for health care workers (39) . Weight and height were measured with clients in standing without shoes and wearing light clothing with digital weight and height scale. Waist circumference was measured by using a flexible tape meter with appropriate position. In all measurement the scale was calibrated to zero level before each measurement.

4.8. Study variables

4.8.1. Dependent Variables

- Raised blood pressure

4.8.2. Independent Variables

- BMI result, smoking status, alcohol intake status, physical activities status, waist circumference measurement result, fruit and vegetable consumption status, salt intake, family history of HTN and History of DM.

- Socio-demographic factors: age, sex, educational status, income level, type of occupation and marital status.

4.9. Operational definitions

Raised blood pressure: systolic BP level of ≥140mmHg and/or diastolic BP level of ≥90 mmHg on one occasion measurement of BP done by health care professional (4).

A current smoker: is defined as workers who smoked at the time of the study or had stopped smoking in less than one year (3).

Daily smoker: is a smoker who smokes one or more cigarettes on daily basis.

A non-smoker: is defined as workers who used no cigarette

Second hand smoker: is a non-smoker who inhales environmental tobacco smoke

Ever drinking alcohol: if the respondent has **ever** consumed any alcohol such beer, Tella, Bordie, Tej, Arake, wine, spirits. (3)

Excess or Harmful alcohol intake: if the participant takes more than one standard unit for female and two standard units for male.

Heavy episodic alcohol drinker: if the respondent has drunk six or more standard drinks in a single drinking occasion

Standard unit of alcohol: a standard unit measures the amount of alcohol in any of alcoholic beverages. The standard drinks measure is a simple way to calculate how much pure alcohol an alcoholic beverage contains. It is calculated using a simple formula: Unit of alcohol=volume in ml*percentage of Alcohol/1000. A standard drink is often 300 ml of beer or 50 ml of whiskey or gin.

Physically active person: a person who is involved in Physical activity, which includes exercise, a subcategory of physical activity that is planned, structured and repetitive, with the objective of improving or maintaining physical fitness (3).

Vigorous intensity physical activities: at least 75 minutes of physical activity (including vigorous gardening, running, fast cycling, fast swimming, or playing sport) spread throughout the week).

Moderate intensity physical activities: at least 150 minutes of physical activity (a mild increase in heart rate or breathing rate resulting from, for eg, brisk walking, climbing stairs, and dancing, gardening or doing household chores) spread throughout the week.

Physically inactive: A person is said to be physically inactive if he is not engaged in moderate intensity physical activity for at least 150 minutes per week or vigorous intensity physical activity for at least 75 minutes per week.

Adequate vegetable and fruit consumption: if he/she take 5 servings of vegetable and fruit daily or 400gm of fruits per day.

Physical measurement: the measurement of height, weight, blood pressure and waist circumference.

Excessive salt consumption: is consumption of more than one tee spoon per day in food

4.10. Data quality assurance

To ensure data quality pre-test was done on 5% of the total sample which is randomly selected patients. Furthermore, the quality of data was ensured through training of data collectors and supervisor, close supervision and prompt feedback. The training was consisted of instruction on extracting techniques, as per data extraction format. The data was checked for any inconsistencies, coding error, out of range, completeness, accuracy, clarity, missing values and appropriate corrections was made by the principal investigator and the supervisor consistently on the daily basis.

4.11. Data processing and analysis

For data processing, master sheet or template was prepared, and the data was entered, categorized, coded, and summarized using EpiData 3.1 and transferred to SPSS version 26 for analysis.

Descriptive statistics (mean and standard deviation) was calculated for continuous variables and frequencies and percentages were calculated to summarize quantitative data. Both bivariate and multivariate logistic regression analysis was done to examine the association between the risk factors and presence of hypertension. A variable with $p < 0.2$ in binary logistic regression analysis was entered in multiple logistic regression to control for potential confounding. Adjusted odds ratios (AOR) with 95% confidence interval (CI) and P-value < 0.05 in the final model were used to determine significant associated factors. Results were presented in the form of tables, figures, and summary statistics.

4.12. Ethical consideration

Up on submission of the finalized and approved proposal, written ethical clearance was obtained from the ethical review committee of the School of Public Health, Addis Ababa University and Addis Ababa public health research and emergency management directorate. A support Letter was written to the Addis Ababa health bureau from the School of Public Health and then to Tirunesh Beijing Hospital.

The benefit and risks of the study was explained to each participant included in the study and a verbal informed consent was obtained from each patient involved in the study. To ensure confidentiality, name and other identifiers of patients was not recorded on the data collection tools and dissemination of the results of the study was not referent with specific respondent but to the general source population.

4.13. Dissemination of result

At the end of the research, study result was presented to the School of Public Health and College of Health Science. After validation, the result will be shared to Ministry of Health, Addis Ababa public health research and emergency management directorate, sub-city health office program and Hospital managers and it will be published in national journals.

5. RESULTS

5.1 Socio-demographic characteristics

Since I try to collect data until the desired sample size is reached the response rate was 100%. Out of the total respondents, 200 (49.0%) were male. The mean age was 36.1 (9.6 SD) years and ranged 18 to 80 years. Nearly two-third of the respondents 255 (62.5%) were between the age group of 30 to 49 years (Fig 2). Married respondents accounted 272 (66.7%) and a respondent with college level of education was 178 (43.6%). Above one-third 151(37.0%) of the participants were government employee, and a quarter 114 (27.9%) of the respondents had less than ETB 12,000 annual household income.

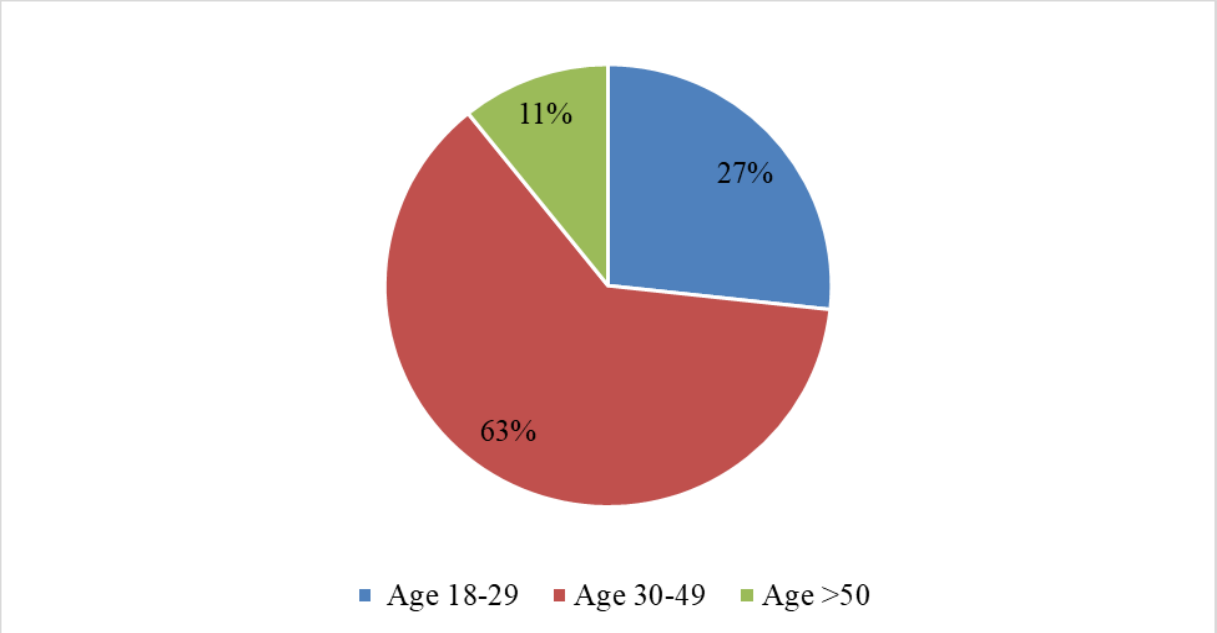

Figure 2: age of respondents among adult outpatient clients in Tirunesh Beijing General Hospital, Addis Ababa, Ethiopia, 2020.

Table 2 Socio-demographic characteristics of respondents among adult outpatient clients in Tirunesh Beijing General Hospital, Addis Ababa, Ethiopia, 2020

Variables	Frequency (n= 408)	Percentage (%)
Sex		
Male	200	49.0
Female	208	51.0
Educational level		
No formal schooling	13	3.2
Primary education	63	15.4
Secondary education	154	37.7
Certificate and above	178	43.6
Marital status		
Single	118	28.9
Married	272	66.7
Divorced	10	2.5
Widowed	8	2.0
Occupation		
House wife	107	26.2
Government employee	151	37.0
Private employee	122	29.9
Trader	6	1.5
Daily laborer	14	3.4
Student	8	2.0
Annual household income(ETB)		
< 12,00	114	27.9
12,000-18,0	96	23.5
18,000- 23,300	46	11.3
23,300-30,000	55	13.5
> 30,000	91	22.3
No data	6	1.5

5.2. Dietary and behavioral characteristics

From 408 study participants, 33 (8.1%) were smokers of whom 22 (66.7%) were smoking cigarettes daily. of the study participants, 121 (29.6%) and 218 (53.3%) respondents had history of exposure to second hand smoke at home and work place respectively.

Among all study participants, 163 (40%) had history of ever drinking alcohol. Among respondents who had history of alcohol drinking over the past 30 days, 54 (33.8%) and 50 (31.3%) had history of excess or harmful use of alcohol and heavy episodic drink respectively.

The mean numbers of days for eating fruit in a typical week were 1.8 with an average of 1.5 servings in those days. The mean numbers of days for eating vegetables in a typical week were 1.6 with an average of 1.4 servings in those days. On the other hand, only 5 (1.2%) of respondents met WHO recommendation for consumption of fruits and vegetables. More than half 224 (54.9%) of study participants had history of excess salt intake.

Among all participants, 270 (66.2%) study participants did not engage in vigorous-intensity activity and also 191 (46.8) study participants did not engage in moderate-intensity activity. And, 277 (67.9%) involved in Walk or use a bicycle for at least 10 minutes. From study participants, 87 (21.3%) were engaged in vigorous sport activities and 148 (36.3%) were engaged in moderate sport activities. And, among those involved in vigorous and moderate sport activities only 8 (9.2%) fulfilled WHO recommendation in a typical week.

Table 3 Dietary and behavioral characteristics of respondents among adult outpatient clients in Tirunesh Beijing General Hospital, Addis Ababa, Ethiopia, 2020 (n=408)

Variables	Frequency	Percentage (%)
Smoking status (n=408)		
Yes	33	8.1
No	375	91.9
History of daily smoking (n=33)		
Yes	22	66.7
No	11	33.3
Ever drinking alcohol (n=408)		
Yes	163	40.0
No	245	60.0
Standard alcoholic drinking status in past 30 days (n=160)		
normal range	106	66.3
excess/harmful use of alcohol	54	33.8
Heavy episodic alcoholic drinking status in past 30 days (n=160)		
<6	110	68.8
≥ 6	50	31.3
Fruit eating status based on WHO recommendation (n=408)		
meet	5	1.2
not meet	401	98.3
not recorded	2	.5
Vegetable eating status based on WHO recommendation (n=408)		
meet	5	1.2
not meet	403	98.8
Excess salt intake (n=408)		
Yes	224	54.9
No	182	44.6
Missing System	2	0.5
Involvement in vigorous-intensity activity (n=408)		
Yes	138	33.8
No	270	66.2

Table 4 Dietary and behavioral characteristics of respondents among adult outpatient clients in Tirunesh Beijing General Hospital, Addis Ababa, Ethiopia, 2021 (n=408…-continued

Variables	Frequency	Percentage (%)
Involvement in moderate activity (n=408)		
Yes	216	52.9
No	191	46.8
Activity status not recorded	1	.2
Involvement in Walk or use a bicycle for at least 10 minutes (n=408)		
Yes	277	67.9
No	131	32.1
Walking or use bicycle status (n=277)		
meet WHO recommendation*	9	3.2
not meet WHO recommendation	268	96.8
Involvement in vigorous-intensity sports (n=408)		
Yes	87	21.3
No	321	78.7
Meeting status of WHO recommendation on vigorous-intensity sports(n=87)		
meet	8	9.2
not meet	79	90.8
involvement in moderate sports (n=408)		
Yes	148	36.3
No	260	63.7
Meeting status of WHO recommendation on moderate sports (n=148)		
meet	11	7.4
not meet	137	92.6

5.3. Respondent's Medical History

From all respondents 135 (33.1%) had family history of hypertension. Eighty nine respondents had their blood glucose measured previously; out of them 28 (31.5%) had history of raised blood glucose level. From all participants 114 (27.9%) had previous history suggestive of heart attack like chest pain.

Table 5 : Medical history of respondents among adult outpatient clients in Tirunesh Beijing General Hospital, Addis Ababa, Ethiopia,2020.

Variables	Frequency	Percentage (%)
Family history of raised blood pressure (n=408)		
Yes	135	33.1
No	270	66.2
Not recorded	3	0.7
Raised blood sugar informed by Health worker (n=89)		
Yes	28	31.5
No	61	68.5
History of chest pain (proxy for heart attack) (n=408)		
Yes	114	27.9
No	286	70.1
Not recorded	8	2.0

5.4. Physical measurement status and raised blood pressure prevalence

The mean BMI of 22.7 (±2.7 SD) and respondents whose BMI of 25 or above was 67 (16.4%) (fig 3). Similarly, 59 (14.5%) of the study participants had increased waist circumference. The mean systolic and diastolic blood pressure was 125.6 mmHg (±14.3 SD) and 76.8 mmHg (±8.8 SD), respectively. The prevalence of raised systolic blood pressure was 76 (18.6%) while raised diastolic blood pressure was 13.2%.

The overall prevalence of raised blood pressure was 18.6%, 95% CI (15, 22.3). The prevalence of raised blood pressure among male was 25%, while prevalence among female was 12.5%. And the prevalence of raised blood pressure was 8.3% among 18 to 29 years old whereas the prevalence of raised blood pressure among age 50 and above was 39%.

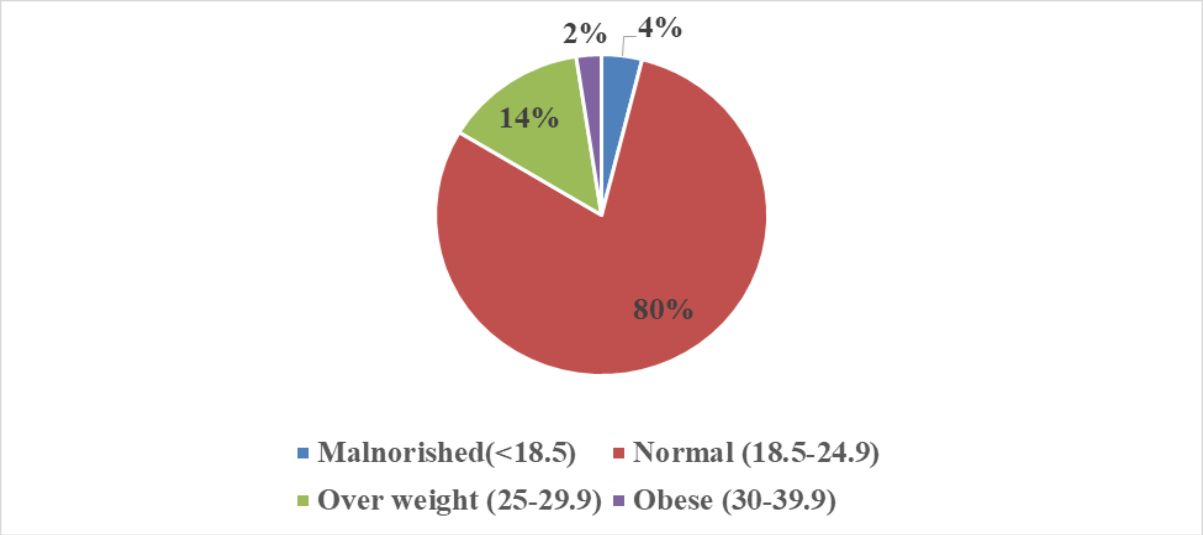

Figure 3: BMI status of the respondents among adult outpatient clients in Tirunesh Beijing General Hospital, Addis Ababa, Ethiopia, 2020.

Table 6: Height, weight, waist circumference and blood pressure measurement of respondents among adult outpatient clients in Tirunesh Beijing General Hospital, Addis Ababa, Ethiopia, 2020 (n=408).

Variables	Frequency	Percentage (%)
waist circumference (n=408)		
Normal	349	85.5
Increased	59	14.5
Raised blood pressure		
No (<140/90)	332	81.4
Yes (≥ 140/90)	76	18.6
Systolic Blood Pressure		
<140	332	81.4%
≥ 140	76	18.6%
Diastolic Blood Pressure		
<90	354	86.8%
≥ 90	54	13.2%

5.5. Factors Associated with raised blood pressure.

24 variables were tested in bivariate, then 12 variables were considered for multivariable analysis, and finally 5 remained significant at multivariable analysis.

The odds of having raised blood pressure among 30 to 49 years and above ≥ 50 years was three times (AOR=3.3, 95% CI: 1.4, 7.7) and seven times (AOR=7.7, 95% CI: 2.8, 21.4) ,respectively , more likely to be raised blood pressure than those whose age was 18 to 29 years. Cigarette smoking (AOR= 6.1, 95% CI: 2.6, 14.3), ever drinking alcohol (AOR= 2.4, 95% CI: 1.4, 4.3), and excessive salt consumption (AOR= 2.1, 95% CI: 1.1, 3.9) resulted a higher risk of raised blood pressure among adults. Similarly, the odds of raised blood pressure among respondents with BMI 25 or above were 2.5 times (AOR= 2.5, 95% CI: 1.2, 5.3) more likely raised blood pressure compared to respondents with BMI less than 25.

Table 7 Bivariate and Multivariable logistic regression analysis for associated factors of raised blood pressure among adult outpatient clients in Tirunesh Beijing General Hospital, Addis Ababa, Ethiopia, 2020

Variable	Blood pressure reading		COR at 95% CI	AOR at 95% CI	P value
	Yes(≥140/90)	No (<140/90)			
Sex					
Male	50 (25.0%)	150 (75.0%)	2.3 (1.4, 3.9)		0.37
Female	26 (12.5%)	182 (87.5%)	1		
Age					
18-29	9 (8.3%)	100 (91.7%)	1		
30-49	50 (19.6%)	205 (80.4%)	2.7(1.3, 5.7)	3.3 (1.4,7.7)	0.005*
≥ 50	17 (39.0%)	27(61.0%)	7.1(2.8, 17.4)	7.7 (2.8, 21.4)	0.000*
Marital status					
Single	15 (12.7%)	103 (87.3%)	1		
Married	54 (19.9%)	218 (80.1%)	1.7 (0.9, 3.1)		0.7
Divorced	3 (30.0%)	7 (70.0%)	2.9 (0.7, 12.5)		0.6
Widowed	4 (50.0%)	5 (50.0%)	6.8 (1.5, 30.1)		0.4
waist circumference					
Normal	54 (15.5%)	295 (84.5%)	1		
Increased	22 (37.3%)	37 (62.7%)	3.2 (1.8, 5.9)	2.3 (1.0, 5.2)	0.62
BMI					
<25	50 (14.7%)	291 (85.3%)	1		
>=25	26 (38.8%)	41 (61.2%)	3.7 (2.1, 6.6)	2.5(1.2, 5.3)	0.02*
Smoking					
Yes	17 (51.5%)	16 (48.5%)	5.7 (2.7, 11.9)	6.1(2.6, 14.3)	0.000*
No	59 (15.7%)	316 (84.3%)	1		
History of exposure to smoking					
Yes	25 (21%)	96 (79 %)	1.2 (1.0, 1.4)		0.6
No	50 (18.1%)	227 (81.9%)	1		
Ever drinking alcohol					
Yes	46 (28.2%)	117 (71.8%)	2.8(1.7, 4.7)	2.4 (1.3, 4.3)	0.004*
No	30 (12.2%)	215 (87.8%)	1		
Excess salt intake					
Yes	55 (24.6%)	169 (75.4%)	2.5(1.4, 4.3)	2.1(1.1, 3.9)	0.02*
No	21 (11.5%)	161 (88.5%)	1		
Involvement in vigorous sports					
Yes	10 (11.5%)	77 (88.5%)	0.5 (0.3, 1.0)		0.46
No	66 (20.6%)	255 (79.4%)	1		
Involvement in moderate sports					
Yes	19 (12.8%)	129 (87.2%)	0.5 (0.3, 0.9)		0.28
No	57 (21.9%)	203 (78.1%)			
History of chest pain					
Yes	27 (23.7%)	87 (76.3%)	1.5 (0.9, 2.5)		0.44
No	49 (17.1%)	237 (82.9%)	1		

* P-value < 0.05

6. DISCUSSION

The study showed that the proportion of raised blood pressure among adult outpatients in Tirunesh Beijing General Hospital in Addis Ababa was 18.6%, 95% CI (15, 22.3). The prevalence of raised blood pressure in Addis Ababa based on the STEPS survey was 22% which was comparable to this study (7). A community based study done in Northern Ethiopia (24), Addis Ababa (20), and Bedele Town (21) indicated the prevalence of raised blood pressure to be 18.1% , 19.1%, and 16.9% respectively. These findings were also similar to our finding.

On the other hand, community based studies done in Jigjiga City (19), Gonder Town (18), Dire Dawa City (22), and Durame Town (23) indicated a higher prevalence of raised blood pressure as 28.3%, 27.9%, 24.43% and 22.4% respectively. These can be explained; the study done in Jigjiga City, Gonder Town, Dire Dawa City, and Durame included participants aged 25-65 years, ≥35 years, 25-64 years, and > 31 years unlike this study which included individuals 18-80 years of age. In addition, these studies included known hypertensive cases unlike our study.

Facility based studies conducted in Yekatit 12 hospital showed a prevalence of 34.7% (29) and Felege Hiwot hospital 27.3% (31). These studies included primarily older participants and known hypertensive cases unlike our study. However, study done in Jimma hospital showed the prevalence of hypertension to be 13.2 (30). This difference might be due to the fact that it included participants aged above ≥15 years.

The implications of this study is that if the hospitals introduces an active screening program for all adult patients visiting the hospital there is an ample opportunity to detect more cases of raised blood pressure and in so doing introduce early management.

Smoking cigarette was one of the determinant factors for raised blood pressure which was similar with a study done in Africa; pan Africa medical report of 2013 (5) and done in sub-Saharan Africa on burden of hypertension (6). The finding is also consistent with survey study report from Kenya (17) , study in Dire Dawa city (22) and Addis Ababa (25). The cigarette smoking may cause vascular injury, plague formation with increased arterial narrowing end up with hypertension.

High body mass index was the determinant factor of raised blood pressure; which is similar with a study done in four sub-Saharan Africa countries (6), a survey in Kenya(17) , North

West Ethiopia (36), Dire Dawa city (22) , Durame town (23), Tigray (27), and Addis Ababa (28). In this study only 87 (21.3%) study participants involved in vigorous physical activity, which physical inactivity results in obesity or over weight.

Raised blood pressure was associated with increase in age which line with the study done in four sub-Saharan Africa (6), Uganda community(34), Gonder town (18) , Dire Dawa city (22), Durame town (23) and public servants in Tigray (27). This may be due to; there was arterial wall stiffness and thickness may increase with increasing age. And majority NCDs increased with increased age that may be risk factors for hypertension.

In this study alcohol consumption is a fourth determinant factor to develop raised blood pressure. The finding was in line with study done in pan Africa medical report of 2013(5), Uganda (34) and survey study report from Kenya (17). In Ethiopia; Facility based study in Felege Hiwot comprehensive referral hospital (31), Community based study in Debere-markos (36), Gonder (18) showed similar result and Survey of Dabat health (40) also implies similar result.

In this study, raised blood pressure was associated with excess use of salt. This was in line with the study done in pan Africa medical report (5) , Durame town (23) and Debre Markos (36) . The association between excess salt intake and hypertension due to the fact that, sodium retention can affect plasma rennin activity and angiotensin II converting enzyme which can lead to hypertension.

The implication of these association of risk factors with raised blood pressure is the opportunity for introduction of systematic screening for these risk factors and implementation of the WHO recommended healthy lifestyle counseling package of care as endorsed in the Global HEARTS initiative (41) .

7. STRENGTHS AND LIMITATIONS

7.1. Strengths

Data were collected by using standard WHO steps tool. Physical measurements were done after calibration of instrument to minimize errors. We found primary data from patients.

7.2. Limitations

Only adult above the age of 18 years were included in study participant, which could to an overestimation of the prevalence of hypertension. Inabilities of performing blood glucose level and blood cholesterol level measurements were the limitation of this study. And some information was based on self-report which obligate to recall bias. Selecting single facilities had also its own limitation. The blood pressure measurement was taken on a single day this had also its own limitation.

The sample size was calculated using single population proportion for raised blood pressure and for risk factors. A double population proportion method would have a produced better sample size estimates.

8. CONCLUSIONS AND RECOMMENDATIONS.

8.1. Conclusions

This study indicated that raised blood pressure is becoming a major public health problem in the study setting. Raised blood pressure was significantly associated with age, smoking, drinking alcohol, excess salt intake and high BMI. And most of the risk factors were modifiable. Hence, stakeholders may use the finding to develop preventive and control strategies to decrease the burden of raised blood pressure and risk factors.

8.2. Recommendations

Based on study findings, the following actions are recommended to be done at each level of the health system.

8.2.1. Ministry of Health, Addis Ababa City administration Health Bureau and Akaki Kality Subcity Health Office:

- Set standard and guidance's related to raised blood pressure screening with early diagnosis of all eligible clients at health facilities.
- Advocate and promote healthy lifestyles.
- Mobilize all health institution to give health education about raised blood pressure and risk factors.
- Mobilize different media to create awareness about hypertension and risk factors.
- If training material is needed on raised blood pressure and risk factors prepare and provide training for health care providers.
- Follow the implementation of raised blood pressure screening, risk factor identification and healthy life style counseling.

8.2.2. Hospital

- Hospital should strengthen regular raised blood pressure screening as well as interventions promoting healthy lifestyles.
- Increase community demand for screening through health education.

- Clinicians at hospital strengthen routine assessment of socio-demographic, behavioral and physiological risk factors of raised blood pressure.
- Give health education as the whole when they come to hospital at morning time.
- Hospital managers should follow the implementation of raised blood pressure screening, risk factor identification and healthy life style counseling

8.2.3. Clients

- Promote healthy life style: - regular physical exercise, regular fruit and vegetable intake…
- Avoid tobacco smoking, khat chewing, harmful use of alcohol, excess salt intake…
- Regular check your blood pressure nearby health institution.
- Apply physician instruction like how to avoid the risk factors, how to gate treatment and control you raised blood pressure.

9. References

1. WHO. WHO Noncommunicable Diseases country profile. 2018.
2. World Health organization. Noncommunicable Diseases Global Monitoring Framework : Indicator Definitions and Specifications. 2013;42.
3. MOH. Guidelines on Clinical and Programmatic Management of Major Non Communicable Diseases. 2016;220.
4. MOH. National Training On Hypertension For Health Care Workers In Ethiopia: 2016.
5. van de Vijver S, Akinyi H, Oti S, Olajide A, Agyemang C, Aboderin I, et al. Status report on hypertension in Africa - Consultative review for the 6th Session of the African Union Conference of Ministers of Health on NCD's. Pan Afr Med J. 2013;16:1–17.
6. Guwatudde D, Nankya-mutyoba J, Kalyesubula R, Laurence C, Adebamowo C, Ajayi I, et al. The burden of hypertension in sub-Saharan Africa : a four-country cross sectional study. 2015;1–8.
7. Ethiopian Federal Ministry of Health. Ethiopia Public Health Institute WHO. STEPS Survey On Risk Factors For Non-Communicable Diseaes And Prevalence Of Selected Ncds , Ethiopia Summary Report Summary Report On Ethiopia Steps Survey On Risk Factors For Chronic Non- Communicable Diseases. 2016;(December 2016):1–13.
8. MOH. Addressing The Impact Of Noncommunicable Diseases And Injuries In Ethiopia : Findings And Recommendations From The Noncommunicable Diseases And Injuries (NCDI) Commission Of Ethiopia A Collaboration with the Global Lancet Commission on Reframing NCDIs. 2018;(November):0–122.
9. World Health Organization. GBD compare [Internet]. Institute for health metrics and Evaluation. 2019. Available from: http://viz.healthmetricsandevaluation.org/gbd-compare/
10. MOH. Performance report. 2020;
11. MOH. National Strategic Plan For The Prevention And Control Of Major Non-Communicable Diseases 2013-2017 EFY (2020/21-2024/25). 2020.
12. EPHI. Services Availability and Readiness Assessment (SARA) Ethiopian Public Health Institute Ethiopia Service Availability and Readiness Assessment (SARA) 2018 Final Report. 2018;119. Available from: http://www.ephi.gov.et/index.php/2014-04-10-07-22-18/download
13. Misganaw A, Mariam DH, Ali A, Araya T. Epidemiology of Major Non-communicable Diseases in Ethiopia : A Systematic Review Search strategy. 2014;32(1):1–13.
14. Salem H, Hasan DM, Eameash A, El-Mageed HA, Hasan S, Ali R. Worldwide Prevalence of Hypertension: a Pooled Meta-Analysis of 1670 Studies in 71 Countries

With 29.5 Million Participants. J Am Coll Cardiol [Internet]. 2018;71(11):A1819. Available from: http://dx.doi.org/10.1016/S0735-1097(18)32360-X

15. WHO. Report on the status of major health risk factors for noncommunicable diseases: WHO African Region, 2015. 2015;

16. Ogah OS, Rayner BL. Recent advances in hypertension in sub-Saharan Africa. 2013;1–8.

17. Mohamed SF, Mutua MK, Wamai R, Wekesah F, Haregu T, Juma P, et al. Prevalence , awareness , treatment and control of hypertension and their determinants : results from a national survey in Kenya. 2018;18(Suppl 3).

18. Abebe SM, Berhane Y, Worku A, Getachew A. Prevalence and associated factors of hypertension: A crossectional community based study in Northwest Ethiopia. PLoS One. 2015;10(4):1–11.

19. Asresahegn H, Tadesse F, Beyene E. Prevalence and associated factors of hypertension among adults in Ethiopia : a community based cross - sectional study. BMC Res Notes [Internet]. 2014;1–8. Available from: https://doi.org/10.1186/s13104-017-2966-1

20. Lemba D. Nshissoa, Angela Reesea, Bizu Gelayea, Sebelewengel Lemmac, Yemane Berhanec and MAW. Prevalence of Hypertension and Diabetes among Ethiopian Adults. 2013;6(1):36–41.

21. Gudina K, Bonsa F, Gudina EK, Hajito KW. Prevalence Of Hypertension And Associated Factors In Bedele Town , Southwest Ethiopia. 2014;(6).

22. Roba HS, Beyene AS, Mengesha MM, Ayele BH. Prevalence of Hypertension and Associated Factors in Dire Dawa City , Eastern Ethiopia : A Community-Based Cross-Sectional Study. 2017;2019.

23. Helelo TP, Gelaw YA, Adane AA. Prevalence and Associated Factors of Hypertension among Adults in Durame. 2014;1–9.

24. Mengistu MD. Pattern of blood pressure distribution and prevalence of hypertension and prehypertension among adults in Northern Ethiopia : disclosing the hidden burden. 2014;1–8.

25. Tesfaye F, Byass P, Wall S. Population based prevalence of high blood pressure among adults in Addis Ababa : uncovering a silent epidemic. 2009;10.

26. Kibret KT, Mesfin YM. Prevalence of hypertension in Ethiopia: A systematic meta-analysis. Public Health Rev [Internet]. 2015;36(1). Available from: http://dx.doi.org/10.1186/s40985-015-0014-z

27. Bayray A, Gebremariam K, Id M, Id YS. Magnitude and risk factors for hypertension among public servants in Tigray , Ethiopia : A cross-sectional study. 2016;1–10.

28. Angaw K, Dadi AF, Alene KA. Prevalence of hypertension among federal ministry civil servants in Addis Ababa, Ethiopia: A call for a workplace-screening program. BMC Cardiovasc Disord [Internet]. 2015;15(1). Available from: http://dx.doi.org/10.1186/s12872-015-0062-9

29. Abebe S, Yallew WW. Prevalence of hypertension among adult outpatient clients in hospitals and its associated factors In Addis Ababa , Ethiopia : a hospital based cross - sectional study. BMC Res Notes [Internet]. 2015;1–6. Available from: https://doi.org/10.1186/s13104-019-4127-1

30. Kebede Gudina E, Michael Y, Assegid S. Prevalence of hypertension and its risk factors in southwest Ethiopia: A hospital-based cross-sectional survey. Integr Blood Press Control. 2012;6:111–7.

31. Belachew A, Tewabe T, Miskir Y, Melese E, Wubet E, Alemu S. Prevalence and associated factors of hypertension among adult patients in Felege - Hiwot Comprehensive Referral Hospitals , northwest , Ethiopia : a cross - sectional study. BMC Res Notes [Internet]. 2018;1–6. Available from: https://doi.org/10.1186/s13104-018-3986-1

32. Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. Hypertension. 2020;75(6):1334–57.

33. Achhab Y El, Nazek L, Maalej M, Alami M, Nejjari C. Prevalence, control and risk factors related to hypertension among moroccan adults: A multicentre study. East Mediterr Heal J. 2019;25(7):447–56.

34. Kotwani P, Kwarisiima D, Clark TD, Kabami J, Geng EH, Jain V, et al. Epidemiology and awareness of hypertension in a rural Ugandan community : a cross-sectional study. 2013;

35. Asemu MM, Yalew AW, Kabeta ND, Mekonnen D. Prevalence and risk factors of hypertension among adults: A community based study in Addis Ababa, Ethiopia. PLoS One [Internet]. 2021;16(4 April):1–14. Available from: http://dx.doi.org/10.1371/journal.pone.0248934

36. Kiber M, Wube M, Temesgen H, Woyraw W, Belay YA. Prevalence of hypertension and its associated factors among adults in Debre Markos Town, Northwest Ethiopia: Community based cross-sectional study. BMC Res Notes [Internet]. 2019;12(1):10–5. Available from: https://doi.org/10.1186/s13104-019-4431-9

37. Pessinaba S, Mbaye A, Yabeta G-à-dieu, Kane A, Ndao CT, Ndiaye MB, et al. Prevalence and determinants of hypertension and associated cardiovascular risk factors : data from a population-based , cross-sectional survey in Saint Louis , Senegal. 2013;24(5):180–3.

38. WHO. WHO STEPS Instrument Question-by-Question Guide. WwwWhoInt/Chp/Steps [Internet]. 2015; Available from: www.who.int/ncds/steps

39. MOH. National Training on Diabetes Mellitus for Health Care Workers_Participant's Manual. 2016.

40. Abebe SM, Andargie G, Shimeka A, Alemu K, Kebede Y, Wubeshet M, et al. The prevalence of non-communicable diseases in northwest Ethiopia : survey of Dabat Health and Demographic Surveillance System. 2017;1–9.

41. WHO. Global HEARTS. Evidence-based treatment protocols. 2018;

10. ANNEXES

Annex I. English version Participants Information Sheet for Interview

Greeting

My name is _____. I come from Addis Ababa University School of Public Health. I am Master's Degree extension student. I am doing my research paper on the title Assessment of Magnitude and Associated Factors of Hypertension among previously undiagnosed adult outpatient attendants in Tirunesh Beijing General Hospital, Ethiopia. The main objective of this study is to determine the magnitude of hypertension and to identify associated factors of hypertension among previously undiagnosed adult outpatient attendants in Tirunesh Beijing General Hospital 2019/20.

This study is principally useful to you to know your blood pressure measure reading and if you have raised blood pressure reading it helps you to know the potential risk factor for your raised blood pressure and have a great role for hospital to know the disease burden and to take the necessary measures to improve quality of care regarding prevention and control of hypertension and associated risk factors. It can also help the policy makers to take public health measures on prevention and control of hypertension and associated risk factors. This study will not have any harm to the study participants except spending time. It takes maximum 30 minute for interview and physical measurement. Your participation is voluntary and you have the right to be involved or not after being fully informed. Nothing will happen if you say "No". If you feel discomfort with the measurement, please be free to withdraw or discontinue at any time you want. The exposure data will not be accessible to anybody other than the study members. Any personal information given by you will be kept anonymously. The study has ethical approval from School of Public Health.

Finally I will say thank for important any kind of response on question and to talk measurements.

If you have any question about the research you may contact Addisu Worku (Principal Investigator) Addis Ababa University, College of Health Sciences, School of Public Health (Tel +251-931-67-91-33) ::

Thus I understand about purpose of the study and I assured that there would be confidentiality of my response and collected data used only for the study. So

Agree ☐ Disagree ☐

Annex II. Amharic version information sheet

የጥናቱ ተሳታፊዎች መረጃ መስጫ

የጥናቱ መግለጫ

ጤና ይስጥልኝ ስሜ፡_____ ይባላል። በአዲስ አበባ ዩኒቨርሲቲ የድህረ ምረቃ የህብረተሰብ ጤና የድህረ ምረቃ ፕሮግራም ማሟያ ለሚሆን ጥናት ከአጥኚው ጋር እየሰራው እገኛለሁ። ጥናቱም በጥሩነሽ ቤጅንግ ጠቅላላ ሆስፒታል ለተመላላሽ ህክምና ከሚመጡት ታካሚዎች ላይ የደም ግፊት እና አጋላጭ መንሰኤዎች ስርጭት ለማጥናት የተዘጋጀ ነው። የጥናቱም አላማ የደምግፊትና አጋላጭ መንሰኤዎች በማወቅ ለጥናቱ ተሳተፊዎቹ የግንዛቤ ፈጠራ ስራ ለመስራት፣የችግሩን ጥልቀት በመረዳት የሆስፒታሉን የደም ግፊት እና አጋላጭ መንሰኤዎች የህክምና አገልግሎት እንድጠናከር ለማስቻል ይረዳል እንድሁም ለአዲስ አበባ ከተማም ይሁን እንደ ሀገር የደም ግፊትና አጋላጭ መንሰኤዎች የመከላከልና የመቆጣጠር ስራ ለማጠነከር የጥናቱ ውጤት ይረዳቸዋል። በመጠይቁ ውስጥ በጣም ሚስጢራዊ የሆኑ እና ግላዊ የሆኑ ጉዳዮች ተካተዋል እንድሁም የደምግፊት፣የቁመት እና የክብደት መጠን ልኬት ይደረግላቸዋል። ጥያቄውን ለመሙላት እና የጤና ምርመራ ለማድረግ ሰላሳ ደቂቃ ያህል ጊዜ ሊወስድ ይችላል።

ጥናቱን አስመልክቶ እርስዎ የሚሰጡት ማንኛውም መረጃ እና የምርመራ ውጤት በሚስጢር የሚጠበቅ በመሆኑ በማንኛውም መንገድ ለሶስተኛ አካል ተላልፎ አይሰጥም ወይም አይጋለጥም፤ማንነትዎ እንዳይታወቅም ስምዎ በጥያቄው ወረቀት ላይ አይመዘገብም ይሁን እንጂ በጥናቱ ላይ በመሳተፍዎ የተለየ ጥቅም አይኖርም ነገር ግን በጥናቱ ላይ በመሳተፍዎ እና ለሚጠየቁት ጥያቄ በዕውቀት ላይ የተመሠረተና ተገቢ የሆነ መረጃ መስጠትዎ የደም ግፊትና አጋላጭ መንሰኤዎች የመከላከልና የመቆጣጠር ዙሪያ ላይ ለሚወጡ ፖሊሲዎች፤ስትራቴጅዎች እና መመሪያዎች/ማኑዋሎች ለማሻሻል ብሎም የአገልግሎቶችን ተደራሽነት ለማሳደግ ከፍተኛ አስተዋጽዖ ያበረክታሉ።

በመጨረሻም ለሚሰጡት ለየትኛውም አይነት ምላሽ ከፍተኛ ምስጋናዬን አቀርባለሁ።ግልጽ ነው? ያልገባህ/ሽ ነገር አለ? መጠየቅ(ማነጋገር) የምትፈልጉት ነገር ካለ በስልክ ቁጥር 0931679133 - አዲሱ ወርቁ ደውለው መጠየቅ ይችላሉ።

በመሆኑም ከላይ የቀረበውን የጥናቱን አላማ ና ጥቅሙን ተረድቼአለሁ፤ሚስጥር እንደሚጠበቅ እና ለሶስተኛ አካል እንደማይተላለፍ ተገንዝቤ አለሁ።ስለዚህ በጥናቱ፡-

አልሳተፍም ☐ እሳተፋ ☐

Annex III. English version Informed Consent

Detail information about the study was explained to me. I have understood that the main objective of this study is to determine the magnitude of hypertension and to identify associated factors of hypertension among previously undiagnosed adult outpatient attendants in Tirunesh Beijing General Hospital 2019/20.

In addition, I understand about how the data collection is proceeding and the time it takes to complete the data collection. I also understand that the research imposes no risk on me. I assured that there would be confidentiality of my response and collected data used only for the study.

It also explained to me that I have the right to stop participation at any time.

In addition, I understood that participating in this study is important for scientific knowledge and base for further study. Therefore, I have now consented to participate in the study by signing this form.

Signature of participants_____date_____

Name and signature of data collectors_____date_____

Annex IV. Amharic version informed consent

<u>የስምምነት መዋዋያ ሰነድ፣</u>

ስለጥናቱ ጥናቱን ከሚካሄደው አካል በቂ መረጃ ተሥጥቶኛል። ከዚህም በተጨማር ከኔ የሚወሰደው መረጃ በእኔ ላይ ምንም አይነት ጉዳት የማያስከትል መሆኑን ተረድቻለው።እንድሁም እኔን በተመለከተ የመረጃ ሚስጥራውነት የተጠበቀ መሆኑን እና በጥናቱ ለመሳተፍ ፍቃደኛ ካልሆኑክ በጥናቱም ለመሳተፍ እንደማልገደድ ነገር ግን ስለ ደም ግፍትና አጋላጭ መንሰኤዎች ዙርያ ያለኝን መረጃ ብሰጥና ምርመራ ባደረግ ወደ ፍት በችግሩ ዙርያ ለሚሰሩ ስራዎች ግብአት መስጠት እንደሚችል ተረድቻለው። ስለሆነም በዝህ ጥናት ለመሳተፍ የተስማማሁ መሆኔን በፍርማዬ አረጋግጣለሁ።

የተሳታፍው ስምና ፈርማ _____ ቀን _____

የመረጃ ሰብሳቡው ስምና ፍርማ_**_____**ቀን **_____**

Annex V. English Version Questionnaire

Questionnaire adapted from WHO step survey tools.

A questionnaire designed to Assessment of magnitude and associated factors of Hypertension among previously undiagnosed adult outpatient attendants in Tirunesh Beijing General Hospital, Ethiopia, 2020.

Date of Interview _____

Question code _____

Section I: Socio demographic factors			
Serial #	**Question**	**Responses**	**Skip**
101	Sex	1. Male 2. Female	
102	How old are you?	Age in years	
103	What is your Educational level?	1. No formal schooling 2. primary education 3. Secondary education 4. Certificate and above	
104	What is your marital status?	1. Single 2. Married 3. Separated 4. Divorced 5. Widowed	
105	What is your current occupation?	1. House wife 2. Government employee 3. Private employee 4. Trader 5. Daily laborer 6. Others, specify _____	
106	Taking the past year, can you tell me what the average earnings (Birr) of the household have been?	1. Per week ⌊_⌋⌊_⌋⌊_⌋ Or Per month ⌊_⌋⌊_⌋⌊_⌋ Or Per year ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ 2. Don't Know	If you don't know go to que.108
107	Can you give an estimate of the annual household income if I read some options to you?	1. ≤ 12,000 Birr 2. More than 12,000 ≤ 18,000 Birr 3. More than 18,000 ≤23,300 4. More than 23,300 ≤ 30,000 5. More than 30,000 6. Don't Know	
Section II : Behavioral measurements			
Tobacco use			
108	Do you currently smoke any tobacco products, such as cigarettes, pipes, shisha..?	1. Yes 2. No	
109	Do you currently smoke tobacco products daily?	1. Yes 2. No	

110	How old were you when you first started smoking daily?	1. Years 2. Don't know	
111	Do you remember how long ago it was?	1. In week ⌊_⌊_⌊_ or in month ⌊_⌊_⌊_ or in year ⌊_⌊_⌊_⌊_ 2. Don't know	
112	On average, How many of the following do you smoke each day	1. Manufactured cigarettes ⌊_⌊_ 2. Number of Shisha sessions ⌊_⌊_ 3. Other , specify (_____	
113	During the past 12 months, have you tried to stop smoking?	1. Yes 2. No	
114	How old were you when you stopped smoking daily?	Age (years)	
115	How long ago did you stop smoking daily?	Years ago ⌊_⌊_⌊_ Or months ago ⌊_⌊_⌊_ Or weeks ago ⌊_⌊_⌊_	
116	During the past 30 days, on how many days did someone in your home smoke when you were present?	1. Number of days 2. Don't know	
117	During the past 30 days, on how many days did someone smoke in closed areas in your workplace (in the building, in a work area or a specific office) when you were present?	1. Number of days 2. Don't know	
Alcohol Consumption			
118	Have you ever consumed any alcohol such beer, Tella, Bordie, Tej, Arake, wine, beherawi, ye bale zaf?	1. Yes 2. No	
1119	Have you consumed an alcoholic drink within the past 12 months?	1. Yes 2. No	If yes, go to qust.122
120	During the past 12 months, How frequently have you had at least one alcoholic drink?	Daily 1 5-6 days per week 2 1-4 days per week 3 1-3 days per month 4 Less than once a month 5	
121	During the past 30 days, on how many occasions did you have at least one alcoholic drink?	1. Number of days 2. Don't know	
122	During the past 30 days, when you drank alcohol, on average, how many standard alcoholic drinks did you have during one drinking occasion?	1. Number of days 2. Don't know	
123	During the past 30 days, what was the largest number of standard alcoholic drinks you had on a single occasion, counting all types of alcoholic drinks together?	1. Largest Number 2. Don't know	
124	During the past 30 days, how many times did you have For men: five or more for women: four or more Standard alcoholic drinks in a single drinking occasion?	1. Number of times 2. Don't Know	
125	During the past 7 days, did you consume any homebrewed alcohol, like Tella, Tej, Katikalla, Bordie?	1. Yes 2. No	If yes, go to 128 & 129

126	During each of the past 7 days, how many standard alcoholic drinks did you have each day	Monday ⌊_⌋⌊_⌋ Tuesday ⌊_⌋⌊_⌋ Wednesday ⌊_⌋⌊_⌋ Thursday ⌊_⌋⌊_⌋ Friday ⌊_⌋⌊_⌋ Saturday ⌊_⌋⌊_⌋ Sunday ⌊_⌋⌊_⌋	
127	On average, how many standard drinks of the following did you consume during the past 7 days?	Homebrewed spirits, e.g. Katikala ⌊_⌋⌊_⌋ Homebrewed beer or wine, e.g. Tella, Tej ⌊_⌋⌊_⌋ Alcohol brought over the border/from another country ⌊_⌋⌊_⌋ Alcohol not intended for drinking, e.g. alcohol-based medicines, perfumes, after shaves ⌊_⌋⌊_⌋ Other untaxed alcohol in the country ⌊_⌋⌊_⌋	
128	During the past 12 months, how often have you found that you were not able to stop drinking once you had started?	Daily or almost daily 1 Weekly 2 Monthly 3 Less than monthly 4 Never 5	
129	During the past 12 months, how often have you failed to do what was normally expected from you because of drinking?	Daily or almost daily 1 Weekly 2 Monthly 3 Less than monthly 4 Never 5	
130	During the past 12 months, how often have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Daily or almost daily 1 Weekly 2 Monthly 3 Less than monthly 4 Never 5	
Diet			
131	In a typical week, on how many days do you eat fruit?	1. Number of days 2. Don't know	
132	How many servings of fruit do you eat on one of those days?	1. Number of servings 2. Don't Know	
133	In a typical week, on how many days do you eat vegetables?	3. Number of days 4. Don't know	
134	How many servings of vegetables do you eat on one of those days?	1. Number of servings 2. Don't Know	
135	How often do you add salt or a salty sauce such as soya sauce to your food right before you eat it or as you are eating it?	Always 1 Often 2 Sometimes 3 Rarely 4 Never 5	
136	How often is salt, salty seasoning or a salty sauce added in cooking or preparing foods in your household?	Always 1 Often 2 Sometimes 3 Rarely 4 Never 5 Don't know	
137	How often do you eat processed food high in salt? By processed food high in salt, I mean foods that have been altered from their natural state, such as packaged salty snacks, canned salty food including pickles and preserves, salty food prepared at a fast food restaurant, cheese, bacon, Mitmitta,	Always 1 Often 2 Sometimes 3 Rarely 4 Never 5	

	and processed meat like Quantta	Don't know	
138	How much salt or salty sauce do you think you consume?	Far too much 1 Too much 2 Just the right amount 3 Too little 4 Far too little 5 Don't know	
Physical Activity			
139	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 10 minutes continuously?	1. Yes 2. no	
140	In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	Number of days	
141	How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours : minutes ☐☐ : ☐☐ Hrs mins	
142	Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for at least 10 minutes continuously?	1. Yes 2. No	
143	In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Number of days	
144	How much time do you spend doing moderate-intensity activities at work on a typical day?	Hours : minutes ☐☐ : ☐☐ Hrs mins	
145	Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places?	1. Yes 2. No	
146	In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?	Number of days	
147	How much time do you spend walking or bicycling for travel on a typical day?	Hours : minutes ☐☐ : ☐☐ Hrs mins	
148	Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like [running or football] for at least 10 minutes continuously?	1. Yes 2. No	
149	In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities?	Number of days	
150	How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	Hours : minutes ☐☐ : ☐☐ Hrs mins	
151	Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, [cycling, swimming, and volleyball] for at least 10 minutes continuously?	1. Yes 2. No	
152	In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities?	Number of days	
153	How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?	Hours : minutes ☐☐ : ☐☐ Hrs mins	
154	How much time do you usually spend sitting or reclining on a typical day?	Hours : minutes ☐☐ : ☐☐ Hrs mins	
History of Raised Blood Pressure			
155	Have you ever had your blood pressure measured by a doctor or other health worker?	1. Yes 2. No	
156	Have you ever been told by a doctor or other health worker that you have raised blood pressure or hypertension?	1. Yes 2. No	
157	Has any of your family members (biological parents, siblings or children) ever had raised blood pressure or hypertension?	1. Yes 2. No	

History of Diabetes			
158	Have you ever had your blood sugar measured by a doctor or other health worker?	1. Yes 2. No	
159	Have you ever been told by a doctor or other health worker that you have raised blood sugar or Diabetes?	1. Yes 2. No	
160	Has any of your family members (biological parents, siblings or children) ever had raised blood pressure or hypertension?	1. Yes 2. No	
History of Cardiovascular Diseases			
161	Have you ever had a heart attack or chest pain from heart disease (angina) or a stroke (cerebrovascular accident or incident)?	1. Yes 2. No	
162	Are you currently taking aspirin regularly to prevent or treat heart disease?	1. Yes 2. No	
163	Are you currently taking statins (Lovastatin/Simvastatin/Atorvastatin or any other statin) regularly to prevent or treat heart disease?	1. Yes 2. No	
Section III :Physical Measurements			
Height and Weight			
	Interviewer ID	☐☐	
	Device IDs for height and weight	Height ☐☐ Weight ☐☐	
164	Height	In Centimeters (cm) ☐☐☐.☐	
165	Weight	In Kilograms (kg) ☐☐☐.☐	
166	For women: Are you pregnant?	1. Yes 2. No	
Waist circumference			
	Device ID for waist	☐☐	
167	Waist circumference	In Centimeters (cm) ☐☐☐.☐	
Blood Pressure			
	Device ID for blood pressure		
	Cuff size used	Small 1 Medium 2 Large 3	
168	Reading 1	Systolic (mmHg) ☐☐☐ Diastolic (mmHg) ☐☐☐	
169	Reading 2	Systolic (mmHg) ☐☐☐ Diastolic (mmHg) ☐☐☐	
170	Reading 3	Systolic (mmHg) ☐☐☐ Diastolic (mmHg) ☐☐☐	

Annex VI. Amharic Version Questionnaire

<u>የአማርኛ መጠይቅ</u>

በጥሩነሽ ቤጅንግ ጠቅላላ ሆስፒታል ለተመላላሽ ህክምና ከሚመጡት ታካሚዎች ላይ የደም ግፊትና እና አጋላጭ መንሰኤዎች ስርጭት ለማጥናት የተዘጋጀ መጠይቅ, 2012።

ቃለ-መጠይቅ የተደረገበት ቀን_____

የመጠይቅ ኮድ _____

ክፍል I: ማህበራዊና ዲሞግራፊያዊ ሁነቶች			
ተ.ቁ	**ጥያቄዎች**	**ምላሾች**	ምርመራ
101	ጾታ	3. ወንድ 4. ሴት	
102	ዕድሜዎ ስንት ነው ?	___ አመት	
103	የትምህርት ደረጃዎ ምን ይመስላል ?	5. መደበኛ ያልሆነ ትምህርት 6. የመጀመሪያ ደረጃ (1-8 ክፍል) 7. ሁለተኛ ደረጃ (9-12 ክፍል) 8. ሰርተፍኬትና ከዚያ በላይ	
104	የጋብቻ ሁኔታዎ ምን ይመስላል ?	6. አላገባሁም 7. አግብቻለሁ 8. ተለያይተን ነው የምንኖረው 9. ፈትቻለሁ 10. ሞቶብኛል/ሞታብኛለች	
105	በዚህ ሰአት በምን የስራ ዘርፍ ተሰማርተዋል ?	7. የቤት እመቤት 8. የመንግስት ስራ 9. የግል ስራ 10. የንግድ ስራ 11. በቀን ስራ 1. ሌላ ከሆነ ይግለጹ_____	
106	የባለፉት አመታትን የገቢ መጠን ታሳቢ በማድረግ የቤተሰበዎ ገቢ ምን ያህል ነው?	1. በሳምንት ⌊__⌋⌊__⌋⌊__⌋ ወይም በወር ⌊__⌋⌊__⌋⌊__⌋ ወይም በአመት ⌊__⌋⌊__⌋⌊__⌋⌊__⌋ 2. አላውቀውም	
107	በጥያቄ ቁጥር 107 ላይ መልሰዎ አላውቀውም ከሆነ የሚከተለው አማራጭ ብሰጠዎት የቤተሰበዎን የወር ገቢ መጠን መገመት ይችላሉ?	7. 12,000 ብር እና በታች 8. ከ12,000 ብር በላይ ነገር ግን 18,000 ብር እና በታች 9. ከ18,000 ብር በላይ ነገርግን 23,300 ብር እና በታች 10. ከ 23,300 ብር በላይ ነገር ግን 30,000 ብር እና በታች 11. ከ 30,000 ብር በላይ 12. አላውቀውም	
ክፍል II የሰነ-ባህሪ ልኬቶች			
ስለ ትምባሆ አጠቃቀም			
108	በአሁኑ ጊዜ ማንኛውም አይነት የትምባሆ ውጤቶች እንደ ሲጋራ፣ሺሻ፣ሀሺሽ፣ጋያ እና የመሳሰሉት ያጨሳሉ ?	3. አዎን 4. አላጨስም	

109	ጥያቄ ቁጥር 109 መልስዎ አዎን ከሆነ በአሁኑ ጊዜ የትምባሆ ውጤቶችን በየቀኑ ያጨሳሉ?	3. አዎን 4. አይደለም	
110	ጥያቄ ቁጥር 110 መልስዎ አዎን ከሆነ ከስንት አመት ጀምሮ ነው በየቀኑ ማጨስ የጀመሩት?	3. ____አመት 4. አላውቀውም	
111	ማጨስ ከጀመሩ ምን ያህል ግዜ እንደሆነዎትያስታውሳሉ?	1. በሳምንት └─┴─┘ ወይም በወር └─┴─┘ ወይም በአመት └─┴─┘ 2. አላውቀውም	
112	የሚከተሉት የትምባሆ አይነቶች ውስጥ በአማካይ በእያንዳንዱ ቀናት ምን ያህል ያጨሳሉ	4. የፋብርካ ስጋራ └─┴─┘ 5. ሺሻ └─┴─┘ 6. ሌላ ካለ ይገለጽ _____	
113	ባለፉት 12 ወራት ውስጥ ማጨስ ለማቆም ሙከራ አድርገው ያውቁ ነበር?	3. አዎን 4. አይደለም	
114	ጥያቄ ቁጥር 114 መልስዎ አዎን ከሆነ በስንት አመት ዕድሜዎ ነበር ማጨስ ያቆሙት?	_____አመት	
115	ጥያቄ ቁጥር 114 መልስዎ አዎን ከሆነ ማጨስ ካቆሙ ስንት ጊዜ ሆነዎት?	1. ከአመት በፊት └─┴─┘ ወይም ከወራት በፊት └─┴─┘ ወይም ከሳምንት በፊት └─┴─┘ 2. አላውቀውም	
116	ባለፉት 30 ቀናት ውስጥ ለምን ያህል ግዜ ነው እርሶ እቤት ውስጥ ሆነው የሆነ ሰው አጨሶ የሚያውቀው?	3. ____ጊዜ 4. አላውቀውም	
117	ባለፉት 30 ቀናት ውስጥ ለምን ያህል ግዜ ነው እርሶ በሚሰሩበት ቦታ (ህንጻ፣ የስራ ስፍራ ወይም ቢሮ) ውስጥ እርሶ ባሉበት የሆነ ሰው አጨሶ የሚያውቀው?	3. ____ቀናት 4. አላውቀውም	
የአልኮል መጠጦች			
118	ከአሁን በፊት የአልኮል ውጤቶች ማለትም አረቄ፣ቢራ፣ጠላ፣ጠጅ፣ቦርዴ፣ወይን ወ.ዘ.ተ. ጠጥተው ያውቃሉ?	3. አዎን 4. አይደለም	
119	ባለፉት 12 ወራት ውስጥ የአልኮል ውጤቶች ጠጥተው ያውቃሉ?	3. አዎን 4. አይደለም	
120	ጥያቄ ቁጥር120 መልስዎ አዎን ከሆነ ለምን ያህል ጊዜ ጠጥተው ያውቃሉ?	1. በየቀኑ 2. 5-6 ቀናት በሳምንት 3. 1-4 ቀናት በሳምንት 4. 1-3 ቀናት በወር 5. በወር ከአንድ ግዜ በታች ስሆን	
121	ባለፉት 30 ቀናት ውስጥ ቢያንስ አንድ ስታንዳርድ አልኮል ለመጠጣት ምን ያህል አጋጣሚ አጋጥመዎት ነበር?	3. __ቁጥር 4. አላውቀውም	
122	ባለፉት 30 ቀናት በአማካይ ምን ያህል ስታንዳርድ የአልኮል መጠጥ ጠጥተው ነበር፤ አንድ ጊዜ የመጠጣት አጋጣም አጋጥሞዎት በነበር ጊዜ?	3. __ቁጥር 4. አላውቀውም	
123	ባለፉት 30 ቀናት በአንድ ግዜ የመጠጣት አጋጣሚ ከፍተኛ ስታንዳርድ የአልኮል መጠጥ የጠጡት ምን ያህል ነበር ? (ሁሉም የመጠጥ አይነቶች በመቁጠር)	3. __ትልቁ ቁጥር 4. አላውቀውም	
124	ባለፉት 30 ቀናት በአንድ የመጠጣት አጋጣሚ ምን ያህል ግዜ ለወንድ፡ አምስትና ከዝያ በላይ ለሴት፡ አራትና ከዝያ በላይ	3. __ምን ያህል ግዜ 4. አላውቀውም	

	ስታንዳርድ አልኮል ጠጥተው ያውቃሉ?		
125	ባለፉት 7 ቀናት ውስጥ እቤት ወስጥ የተሰሩ እንደ ጠላ፣ጠጅ ፣አርቄ፣ ቦርዴ የመሳሰሉት አልኮል ጠጥተው ያውቃሉ ?	3. አዎን 4. አይደለም	
126	ባለፉት 7 ቀናት ውስጥ በእያንዳንዱ ቀናት ምን ያህል ስታንዳርድ የአልኮል መጠጥ ጠጥተዋል?	ሰኞ ⌊_⌋⌊_⌋ ማክሰኞ ⌊_⌋⌊_⌋ ረቡዕ ⌊_⌋⌊_⌋ ሀሙስ ⌊_⌋⌊_⌋ አርብ ⌊_⌋⌊_⌋ ቅዳሜ ⌊_⌋⌊_⌋ እሁድ ⌊_⌋⌊_⌋	
127	ባለፉት 7 ቀናት ውስጥ በአማካይ ምን ያህል ስታንዳርድ የአልኮል መጠጥ ጠጥተዋል?	አረቄ ⌊_⌋⌊_⌋ ቢራ/ ወይን ⌊_⌋⌊_⌋ ጠጅ/ጠላ ⌊_⌋⌊_⌋ ሌላ ካለ ይግለጹ ⌊_⌋⌊_⌋	
128	ባለፉት 12 ወራት ውስጥ ምን ያህል ግዜ የአልኮል መጠጥ እንዴ ከጀመሩ ማቆም እንደማትችሉ ተረድተዋል?	1. በየቀኑ 2. በየሳምንቱ 3. በየወሩ 4. በጭራሽ	
129	ባለፉት 12 ወራት ውስጥ ምን ያህል ግዜ መስራት የሚገዎትን ስራ በአልኮል መጠጥ ምክንያት መስራት አቃተዎት?	1. በየቀኑ 2. በየሳምንቱ 3. በየወሩ 4. በጭራሽ	
130	ባለፉት 12 ወራት ምን ያህል ግዜ ነው ከከባድ መጠጥ ማግስት ጠዋት ለመንቃት የአልሆል መጠጥ የሚትጠጡት?	1. በየቀኑ 2. በየሳምንቱ 3. በየወሩ 4. በጭራሽ	
አመጋገብ			
131	በሳምንት ውስጥ ምን ያህል ቀናት ፍራ ፍሬ ይመገባሉ?	5. ___ ቀናት 6. አላውቀውም	
132	ከላይ በተጠቀሱት ቀናት ምን ያህል ገበታ የፍራ ፍሬ ምግብ ይመገባሉ?	3. ___ ገበታ 4. አላውቀውም	
133	በሳምንት ውስጥ ምን ያህል ቀናት አትክልት ይመገባሉ?	1. __ቀናት 2. አላውቀውም	
134	ከላይ በተጠቀሱት ቀናት ምን ያህል ገበታ የአትክልት ምግብ ይመገባሉ?	3. ___ ገበታ 4. አላውቀውም	
135	ምን ያህል ግዜ ጨው ወይም የጨው ውጤቶችን በሚመገቡት ምግብ ላይ ከመመገብዎ በፊት ወይም ሲመገቡ ይጨምራሉ?	1. ሁሌም 2. በአብዛኛው ግዜ 3. አልፎ አልፎ 4. በጥቂቱ 5. በጭራሽ 6. አላውቀውም	
136	ምን ያህል ግዜ ጨው ወይም የጨው ውጤቶችን እቤት ውስጥ በሚያበስሉ ወይም በሚያዘጋጁ ምግቦች ላይ ይጨምራሉ?	1. ሁሌም 2. በአብዛኛው ግዜ 3. አልፎ አልፎ 4. በጥቂቱ	

		5. በጭራሽ 6. አላውቀውም	
137	ምን ያህል ግዜ የጨው መጠናቸው ከፍ ያለ መጠን ባለቸው የተዘጋጁ ወይም የታሸጉ ምግቦችን ለምሳሌ ሚጥሚጣ፣ቋንጣ፣ችብስ የመሳሰሉ ምግቦችን ተመግበው ያውቃሉ?	1. ሁሌም 2. በአብዛኛው ግዜ 3. አልፎ አልፎ 4. በጥቂቱ 5. በጭራሽ 6. አላውቀውም	
138	ምን ያህል ጨው ወይም የጨው ውጤቶችን የምትመገቡ ይመስላቸዋል?	1. በጣም ብዙ 2. ብዙ 3. ትክክለኛው መጠን 4. ትንሽ 5. በጣም ትንሽ 6. አላውቀውም	
የአካል ብቃት እንቅስቃሴ			
139	የእርሶ የስራ ዘርፍ ከባድ የአካል እንቅስቃሴ የሚጠይቅ ሆኖ ከፍተኛ የልብ ምትና አተነፋፈስ የሚያስከትል ነው ወይ?	3. አዎን 4. አይደለም	
140	በሳምንት ውስጥ እንደ አንዱ የስራህ አካል በከባድ የአካል እንቅስቃሴ የሚጠይቅ እንቅስቃሴ ላይ ስንት ቀን ይሳተፋሉ?	____ቀናት	
141	በቀን ውስጥ ከባድ የአካል እንቅስቃሴ በማድረግ ስንት ሰአት ያሳልፋሉ?	☐☐ ☐☐ : ሰአታት ደቂቃዎች	
142	የእርሶ የስራ ዘርፍ መካከለኛ የአካል እንቅስቃሴ የሚጠይቅ ሆኖ መጠነኛ የልብ ምትና አተነፋፈስ የሚያስከትል ነው ወይ?	3. አዎን 4. አይደለም	
143	በሳምንት ውስጥ እንደ እንዱ የስራህ አካል በመካከለኛ የአካል እንቅስቃሴ የሚጠይቅ እንቅስቃሴ ላይ ስንት ቀን ይሳተፋሉ?	____ቀናት	
144	በቀን ውስጥ መካከለኛ የአካል እንቅስቃሴ በማድረግ ስንት ሰአት ያሳልፋሉ?	☐☐ ☐☐ : ሰአታት ደቂቃዎች	
145	ወደ ሆነ ቦታ ለመሄድ የ10 ደቂቃ የእግር ጉዞ ወይም ባይስክል ይጠቀማሉ?	3. አዎን 4. አልጠቀመም	
146	ቀጣይነት ባለው ሁኔታ በሳምንት ውስጥ ስንት ቀናት ወደ ሆነ ቦታ ለመሄድ የ10 ደቂቃ የእግር ጉዞ ወይማ ባይስክል ይጠቀማሉ?	___ቀናት	
147	በሳምንት ውስጥ ስንት ሰአት ወደ ሆነ ቦታ ለመሄድ የእግር ጉዞ ወይም ባይስክል ይጠቀማሉ?	☐☐ ☐☐ : ሰአታት ደቂቃዎች	
148	ቀጥይነት ባለው መልኩ የ10 ደቂቃ ከባድ የአካል እንቅስቃሴ ስፖርት ወይም መዝናኛ ከፍተኛ የልብ ምትና አተነፋፈስ የሚጨምር እንቅስቃሴ ያደርጋሉ ?	3. አዎን 4. አልሰራም	
149	በሳምንት ውስጥ ስንት ቀን ከባድ የአካል እንቅስቃሴ ስፖርት ወይም መዝናኛ እንቅስቃሴ ላይ ይሳተፋሉ?	__ቀናት	
150	በቀን ውስጥ ስንት ሰአት በከባድ የአካል እንቅስቃሴ ስፖርት ወይም መዝናኛ እንቅስቃሴ ላይ ይሳተፋሉ?	☐☐ ☐☐ : ሰአታት ደቂቃዎች	
151	ቀጥይነት ባለው መልኩ የ10 ደቂቃ መካከለኛ የአካል እንቅስቃሴ ስፖርት ወይም መዝናኛ ከፍተኛ የልብ ምትና አተነፋፈስ የሚጨምር እንቅስቃሴ ያደርጋሉ ?	3. አዎን 4. አልሰራም	
152	በሳምንት ውስጥ ስንት ቀን በመካከለኛ የአካል	_ቀናት	

	እንቅስቃሴ ስፖርት ወይም መዝናኛ እንቅስቃሴ ላይ ይሳተፋሉ?		
153	በቀን ውስጥ ስንት ሰአት በመካከለኛ የአካል እንቅስቃሴ ስፖርት ወይም መዝናኛ እንቅስቃሴ ላይ ይሳተፋሉ?	⌊_⌋⌊_⌋ : ሰአታት ደቂቃዎች	
154	በቀን ውስጥ ስንት ሰአት በመቀመጥ ወይም በመተኛት ያሳልፋሉ?	⌊_⌋⌊_⌋ : ሰአታት ደቂቃዎች	
ስለ ደም ግፊት ታሪክ			
155	ከአሁን በፊት የደም ግፊት በዶ/ር ወይም በሌላ ጤና ባለሞያ ተለክተው ያውቃሉ ?	3. አዎን 4. አልተለካሁም	
156	ከአሁን በፊት የደም ግፊት እንዳለቦዎት በዶ/ር ወይም በሌላ ጤና ባለሞያ ተነግሮት ያውቃሉ?	3. አዎን 4. አይደለም	
157	ከቤተሰበዎ ውስጥ እንደ እናት አባት፣እህትማሞችና ወንድማማቶች ወይም ልጆች ያሉ ደም ግፊት ያለባቸው አሉ ?	3. አሉ 4. የሉም	
ስለ ስኪር በሽታ ታርክ			
158	ከአሁን በፊት የደም ስኪር መጠን በዶ/ር ወይም በሌላ ጤና ባለሞያ ተለክተው ያውቃሉ?	3. አዎን 4. አልተለካሁም	
159	ከአሁን በፊት የስኪር መጠን ከፍ ማለት ወይም የስኪር በሽታ እንዳለቦዎት በዶ/ር ወይም በሌላ ጤና ባለሞያ ተነግሮት ያውቃሉ?	3. አዎን 4. አይደለም	
160	ከቤተሰበዎ ውስጥ እንደ እናት አባት፣እህትማሞችና ወንድማማቶች ወይም ልጆች ያሉ ስኪር መጠን ከፍ ማለት ወይም የስኪር በሽታ ያለባቸው አሉ ?	1. አሉ 2. የሉም	
ስለልብና የደም ዝውውር በሽታዎች ታርክ			
161	ከአሁን በፊት የደረት ውጋት ወይም ህመም ከልብ ህመም ወይም ከድንገተኛ ስትሮክ የተነሳ አለበዎት?	3. አዎን 4. የለበኝም	
162	ጥያቄ ቁጥር164 መልስዎ አዎን ከሆነ ለልብ ህመም በአሁኑ ግዜ አስፕሪን እየወሰዱ ነው ?	3. አዎን 4. አይደለም	
163	ጥያቄ ቁጥር164 መልስዎ አዎን ከሆነ ለልብ ህመም በአሁኑ ግዜ ስታትን እየወሰዱ ነው ?	3. አዎን 4. አይደለም	
ክፍል III :የሠውነት መጠን ልኬት			
ቁመትና ክብደት			
	የተጠያቂ ኮድ	⌊_⌋⌊_⌋	
	የቁመትና ክብደት መለከያ ኮድ	ቁመት ⌊_⌋⌊_⌋ ክብደት ⌊_⌋⌊_⌋	
164	ቁመት	በሴንቲ ሜትር ⌊_⌋⌊_⌋⌊_⌋. ⌊_⌋	
165	ክብደት	በኪሎ ግራም ⌊_⌋⌊_⌋⌊_⌋. ⌊_⌋	
166	ለሴቶች፡ ነፍሰጡር ነዎት?	3. አዎን 4. አይደለሁም	
የወገብ ልኬት			
	የወገብ ልኬት ኮድ	⌊_⌋⌊_⌋	
167	የወገብ ልኬት መጠን		
የደም ግፊት ልኬት			
	የደም ግፊት መለኪያ መሳሪያ ኮድ		
	የካፍ መጠን	1. ትንሽ 2. መካከለኛ 3. ትልቅ	
168	Reading 1 የመጀመሪያ ንባብ	የደም ቅዳ ምት ⌊_⌋⌊_⌋⌊_⌋	

		የደም መልስ ምት ⌊__⌋__⌋__⌋	
169	Reading 2 ሁለተኛ ንባብ	የደም ቅዳ ምት ⌊__⌋__⌋__⌋ የደም መልስ ምት ⌊__⌋__⌋__⌋	
170	Reading 3 ሶስተኛ ንባብ	የደም ቅዳ ምት ⌊__⌋__⌋__⌋ የደም መልስ ምት ⌊__⌋__⌋__⌋	