ADDIS ABABA UNIVERSITY SCHOOL OF

PUBLIC HEALTH

PREVALENCE AND ASSOCIATED FACTORS OF HYPERTENSION AMONG WORKERS OF STEEL FACTORIES, AKAKI, ADDIS ABABA

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Prevalence and Associated Factors of Hypertension among workers of Steel factories, Akaki, Addis Ababa

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Acronyms used throughout this research

AOR**:** - Adjusted Odds Ratio

BP: - Blood Pressure

CVD: - Cardiovascular Diseases

CO**:** - Central Obesity

CI**:** - Confidence Interval

COR**:** - Crude Odds Ratio

CNCD: - Chronic non communicable disease

CSA: - Central Statistical Agency

DALY: - Disability adjusted life years

DBP: - Diastolic Blood Pressure

EDHS: - Ethiopian Demographic and Health Survey

HIV/AIDS: - Human Immune deficiency Virus/Acquired Immune Deficiency Syndrome

MmHg: - Millimeters of Mercury

NCD: - Non Communicable Disease

NHANES: - US National Health and Nutrition Examination Survey

SBP: - Systolic Blood Pressure

SPSS: - Statistical Package for Social Science

SSA: - Sub Saharan Africa

WHO: - World Health Organization

ABSTRACT

Background:-Epidemiological studies of hypertension in Ethiopia are rare. The studies undertaken so far show that hypertension was an important public health problem in Ethiopia. Thus, epidemiological studies using standardized measurement techniques are required to characterize the problem more accurately.

Objective:- To assess magnitude of hypertension and associated factors, among adult workers of the Steel Factories in Akaki Addis Ababa, Ethiopia 2012/2013.

Methods: - A descriptive, cross-sectional study was conducted on 501 factories workers aged 18 and above. Data were collected using a two-step approach, consistent with the WHO procedure, using structured questionnaire, physical and blood pressure measurements. Hypertension was defined as Blood pressure greater or equal to 140/90 mmHg.

Results:-The prevalence of hypertension among the study subjects was 37.7%, 95% CI (0.3, 0.4) and (40.1% males and 22.4% females). Increasing age and a positive family history of hypertensions, educational status, heavy alcohol drinkers and overweight are important factors of hypertension.

Conclusion: - The study indicates that hypertension is becoming public health problem. Awareness programs should be established in the country, together with periodic screening of high risk populations.

1.0 Introduction

1.1 Background

Cardiovascular diseases (CVD), most of which are due to atherosclerosis (mainly heart attack and stroke) and often related to arterial hypertension, are responsible for nearly 20% of all deaths world-wide (nearly 10 million).

They are the principal cause of death in all developed countries accounting for 50% of all deaths and are also emerging as a prominent public health problem in developing countries, ranking third with nearly 16% of all deaths. They have already become the first cause of death in countries such as Argentina, Chile, Cuba, Mauritius, Singapore, Sri Lanka, Trinidad and Tobago and Uruguay(1) .

The latest estimate from the World Health Organization (WHO) is that of the 57 million deaths that occurred in the world in 2008, 36 million (63%) were the result of NCD. Four-fifths of these deaths were in low and middle-income countries, and 29% of those deaths were in people under 60years old – compared with 13% in high-income countries. Without intervention, deaths from NCD are set to increase by 15% between 2010 and 2020, according to WHO predictions, with the biggest increases occurring in the African, Eastern Mediterranean, and South East Asian regions (2).

Hypertension has become, in recent times, of growing public health concern in developing countries. For the developed countries, the trend emerges somewhat in the character of a paradox: remarkable successes achieved in under nutrition and infectious disease control within the last century has produced a sharp decline in infant mortality, as a result of which life expectancies have increased considerably. However, non communicable diseases have replaced infectious diseases as the major causes of morbidity (3).

Although, it is clear that Ethiopia, if not the case already, will develop along the demographic trends of other countries, developing or developed, with regards to NCDs. Presently, the country‟s population pyramid typifies that of most developing countries with very low proportion of aged persons: The proportion of young population under age 15 has declined from 49.82% in 1984 to 45.0% in 2007. Conversely, the proportion of population in the

working age group 15-64 has increased from 50.2 in 1984 to 51.9 percent in 1994. Furthermore, 16% of its 73.9 million populations (2007 Population and Housing Census Results**)** live in urban areas (4).

Given current urbanization and industrialization efforts in the country however, together with improvements in health services, a demographic transition in which the proportion of adults and aged population increase significantly vis-a-vis the younger age group. Expectedly, this would lead to a rise in the prevalence of chronic diseases that are generally more common among older age populations (5).

Little is known about the magnitude and factors of hypertension in Ethiopia, however, recent evidences indicate that hypertension and raised blood pressure are increasing partly because of the increase in risk factors including smoking, obesity, and use of alcohol and lack of exercise (6). Thus, this study aimed to assess the prevalence and associated factors of hypertension among adult workers of the steel Factories, Akaki, Addis Ababa, Ethiopia. At the end hopefully we can address prevalence based on that we can intervene before develop complication.

1.2. Rational of the study

The prevention and control of hypertension has not received due attention in many developing countries. In these countries health care resources are overwhelmed by other priorities including HIV/AIDS, tuberculosis, and malaria. However, the rapid urbanization of this country has created a change in the lifestyles of population interms of nutrition, physical activities and behaviors such as smoking, alcohol and drug use among urban dwellers, which may impact on the risk of developing NCDs. Thus it is timely to address NCDs among urban dwellers. To this end the study aims to provide a baseline data on the prevalence and possible factors of hypertension, among factory workers in Akaki, a suburb of Addis Ababa, in Ethiopia. The choice of Akaki was made taking into consideration, stability of the population which may help in the establishment of a longitudinal cohort study on NCDs in the country, using Akaki factories as a case study.

1.3. Significance of the study

The 53rd World Health Assembly of the World Health Organization in 2000 passed a resolution, with a goal to support Member States in their efforts to reduce the toll of morbidity, disability and premature mortality related to NCDs. Specific strategies adapted at the meeting focus on assisting Member States in mapping the emerging epidemics of NCDs in their respective countries and analyzing the socio-economic, behavioral and political determinants of observed trends. This will provide guidance for policy, legislation and the financial commitment of nations towards NCDs (7).

An appropriate first step towards initiating NCDs risk factor surveillance system therefore, is for countries to conduct a „baseline" nationwide survey, where this has not been done and provide an effective source of evidence to support and guide the development and implementation of specific prevention and control program (8).

By offering up to date information on the status of hypertension, it may help the prevalence and risk factors of the diseases and thus facilitate a future assessment of their burden and impact. In turn, this should enable relevant health administrators to develop comprehensive and appropriate community-based health promotion strategies to encourage healthy lifestyles among its populations, detect cases early enough, and choose.

2. Literature Review

2.1. Definition of Hypertension

Hypertension, sometimes called arterial hypertension, is a chronic medical condition in which the blood pressure in the arteries is elevated. This requires the heart to work harder than normal to circulate blood through the blood vessels. Blood pressure is summarized by two measurements, systolic and diastolic, which depend on whether the heart muscle is contracting (systole) or relaxed between beats (diastole). Normal blood pressure at rest is within the range of 100-140mmHg systolic (top reading) and 60-90mmHg diastolic (bottom reading). High blood pressure is said to be present if it is persistently at or above 140/90 mmHg (9).

2.2. Epidemiology of hypertension

Arterial Hypertension (AH) is the most common cardiovascular disease and is a major public health problem in both developed and developing countries. It produces a marked effect on patients, relatives and society, either because of hypertension per se or through its complications (stroke, heart attack, ischemic heart disease, renal dysfunction and heart failure) which can produce premature death or permanent disability. The risk of developing a cardiovascular complication is higher when the individual combines hypertension with other risk factors such as hypercholesterolemia/dislipidemia or smoking. It is known that more than 95% of hypertensive patients in the community are of essential or idiopathic/unknown an etiology and only a small percentage have an identifiable cause (secondary hypertension). Epidemiological evidence shows that there are several factors which play an important role in the development, evolution and prognosis of arterial hypertension, some of them non-modifiable, such as age, sex, ethnicity and heredity, and others modifiable, such as body weight, alcohol intake and sedentary life (1).

In the year 2000, nearly one billion people or 26% of the adult population of the world had hypertension. It was common in both developed (333 million) and developing (639 million) countries; however rates vary in different regions as low as 3.4% (men) and 6.8% (women) in rural India and as high as 68.9% (men) and 72.5% (women) in Poland (10).

Study done in Vietnam reported that the prevalence of hypertension was 14.1%, of whom, only 17.4% were aware of their hypertensive status. Men had higher hypertensive than women and age was positively associated with hypertension (11).

Another study reported that an overall of 26.4% of the adult population in 2000 had hypertension (26.6% men and 26.1% women), and 29.2% were projected to have this condition by 2025. The number of adults with hypertension in 2025 was predicted to increase by about 60% to a total of 1.56 billion (12).

A study in Tibet reported that the crude prevalence of hypertension was 55.9%. The age-standardized prevalence was 57.1% for the whole Sample using the 2001 WHO World Standard Population (13).

A study in US National Health and Nutrition Examination Survey 2007–2010 study reported that there was a statistically significant difference in the age-adjusted prevalence of hypertension between those with abdominal obesity (35.0%) and without abdominal obesity (21.0%). Consistently across all levels of the demographic and other covariates, participants categorized as abdominally obese had a higher prevalence of hypertension when compared with participants categorized as not abdominally obese. These differences, with the exception of the 80 or more years of age category, were all statistically significant (14).

2.3. Distribution of hypertension in Africa

It has been suggested that the prevalence of cardiovascular disease and hypertension was increasing rapidly in sub-Saharan Africa (SSA). The current prevalence in many developing countries, particularly in urban societies, was said to be already as high as those seen in developed countries (15).

Studies in sub Saharan Africa reported that hypertension was the most prevalent risk factor for CVD. The crude prevalence of hypertension ranged from 19.0% in Tanzania to 32.0% in Namibia. The age adjusted prevalence was 19.3% in Nigeria, 21.4% in Kenya, 23.7% in Tanzania, 38.0% in Namibia and 18.2% in Sudan (16, 17).

The prevalence of hypertension was estimated by a population-based survey in 1798 Cameroonian subjects aged 25-74 years which showed the age-standardized prevalence of hypertension to be significantly higher in the urban than the rural area (16.4% in urban men and 12.1% in urban women, and 5.4% in rural men and 5.9% in women) (18).

A survey on detection, management, and control of hypertension in 12 villages in Ashanti, Ghana established an adult prevalence rate of 28.7% overall and comparable in men and women, but higher in semi-urban villages (32.9% versus 24.1%), and increased with age (19).

A study in Ghana showed that the prevalence of hypertension ranged from 19 to 48% between studies. Sex differences were generally minimal whereas urban populations tended to have higher prevalence than rural population in studies with mixed population types. Factors independently associated with hypertension included older age group, over-nutrition and alcohol consumption (20).

A national cross-sectional study in Tunisia established the prevalence of elevated BP was 35.1% (21). And a community-based study done in Uganda showed the age-standardized prevalence of hypertension was 30.5 % (22).

Hospital-based cross-sectional study, which took place at the Out-Patients Department of St. Mary‟s Catholic General Hospital in Nigeria, showed that out of the 405 subjects that participated in the study, 124 (30.6%) were hypertensive. The study revealed that age, occupation, body mass index, waist circumference and hip circumference were significantly associated with high blood pressure (23).

A study in Eritrea reported that the prevalence of hypertension in the general population was 16%, with the highest levels in unemployed people and local merchants (24%) and the lowest levels in students (7.1%) (24).

2.4 Situation of hypertension in Ethiopia

Very few studies in hypertension epidemiology have been undertaken in Ethiopian.

A population-based prevalence study conducted in Addis Ababa, Ethiopia reported a 31.5% and 28.9% prevalence of hypertension among males and females respectively (25).

Another study done Gonder showed that the overall prevalence of hypertension was 28.3%, of whom more than a third (37.0%) did not know they had hypertension (26).

A comparative study in Butajira showed that the prevalence of hypertension was significantly higher among Khat chewers (13.4%) than non-chewers (10.7%) (27).

A study conducted Gilgel Gibe Field Research Center reported that the overall prevalence of CNCD was 8.9% (7.8% men and 9.8% women). The specific observed prevalence was 0.5% for diabetes mellitus (DM), 2.6% for hypertension, 3.0% for cardiovascular diseases, 1.5% for asthma and 2.7% for mental illness (28).

2.5. Implications of Policy Neglect and Action

In spite of the apparent increase in the burden of NCDs across the various regions of the world, including SSA, many countries in the region, appear not to be sufficiently addressing the challenges of NCDs within the framework of their existing health policies, as specific strategies or guidelines to tackle these issues, have not been put in place. This may be due to the fact that being relatively poor countries, with limited resources and competing demands, their energies are mostly directed towards dealing with infectious diseases and under-nutrition – issues of top priority especially for these countries (29).

However, it should be stated that unless countries begin to tackle both chronic and infectious diseases simultaneously, the burden of NCDs is likely to increase hugely over the coming decades as projected in the Global Burden of Diseases Study. When this occurs, it could overwhelm the already over-stretched health care resources. Indeed, projections are that by the year 2020, the proportion of the overall disease burden in SSA due to NCDs will increase to between 26% and 34%; among adults aged 15-59 years, the increase could be 37% to 42%. Therefore, failure to take action on NCDs could also jeopardize the development of effective measures for the prevention and control of these diseases (29, 30).

2.6 Risk Factors for hypertension

2.5.1 Age and Sex

In many literatures hypertension gradually increases during adult life and highest in old age populations. A study in Skaraborg showed that the prevalence of hypertension was 20% in both men and women with a steep increase by age (31).

Some studies have reported degrees of sex variation in the prevalence of hypertension. A Study done in Vietnam showed men were often more hypertensive than women (11).

2.5.2 Obesity and Sedentary lifestyle

The 2011years EDHS, report of Addis Ababa showed that around 20 percent of women and 12.4 percent of men are overweight or obese (BMI ≥25 kg/m2) (32).

Study in Uganda showed Prevalence of overweight to be 18% (25.2% of women; 9.7% of men) while prevalence of obesity was 5.3% (8.3% of women; 2.2% of men). Factors associated with being overweight included being female, peri-urban residence and higher socioeconomic status, and increasing age (33).

Lack of physical activity and unhealthy dietary habits are important modifiable risk factors for hypertension. Study in association of smoking and khat (*Catha edulis* Forsk) use with high blood pressure among adults in Addis Ababa, Ethiopia, 2006 showed that daily current smoking and regular khat chewing significantly increased mean diastolic BP (34).

Study done in Uganda reported that alcohol users were more likely to be hypertensive compared to participants reporting to have never used alcohol (22).

Data from different national and regional surveys showed that hypertension is common in developing countries, particularly in urban areas, and that rates of awareness, treatment, and control are low. Several hypertension risk factors seem to be more common in developing countries than in developed regions. Findings from serial surveys show an increasing prevalence of hypertension in developing countries, possibly caused by urbanization, ageing of population, changes to dietary habits, and social stress. High illiteracy rates, poor access to health facilities, bad dietary habits, poverty, and high costs of drugs contribute to poor blood pressure control. The health system in many developing countries is inadequate because of low funds, poor infrastructure, and inexperience. Priority is given to acute disorders, child and maternal health care, and control of communicable diseases. Governments, together with medical societies and

non-governmental organizations, should support and promote preventive programs aiming to increase public awareness, educate physicians, and reduce salt intake. Regulations for the food industry and the production and availability of generic drugs should be reinforcing (35).

The findings in this study will complement findings of other studies and fill the gaps not addressed by others since similar studies in hypertension are lacking especially in our setting. It is hoped that this study will contribute to wider understanding of the more appropriate behavioral and biological risk factors and will provide some useful lessons for actors involved in developing strategies to tackle the hypertension/NCD. This study was undertaken by considering the following hypothesis: the first one was that prevalence of hypertension in steels factories. Secondly, Socio demographic, Behavioral and Biological might be different from previous studies

This research is illustrated below as:

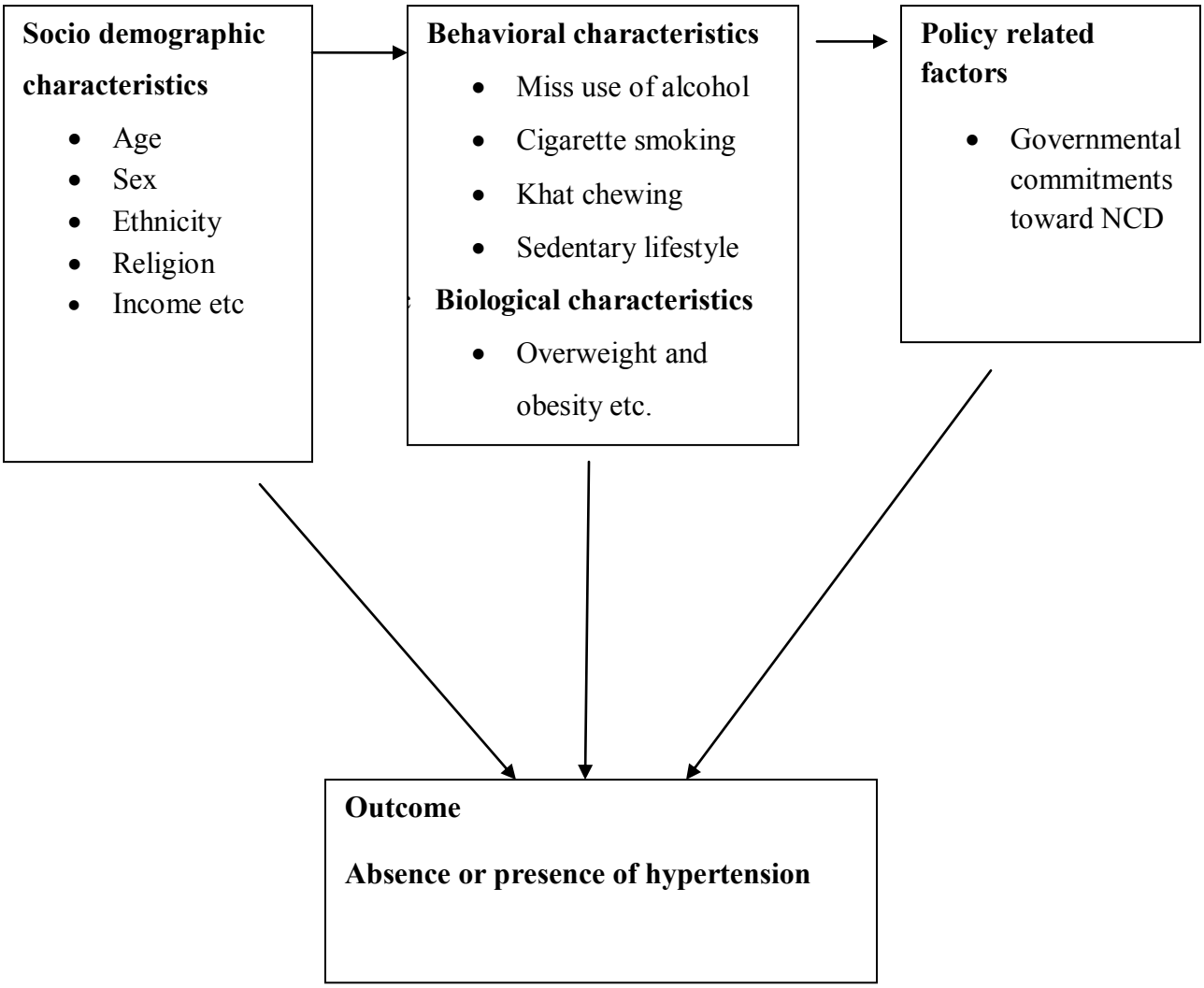

Figure 1 Conceptual framework of hypertension

3.0. OBJECTIVE

3.1 General objective

- To assess the magnitude of hypertension, and associated factors, among adult workers of the steel factories Akaki, Addis Ababa, Ethiopia.2013Gc.

3.2 Specific objective

- To estimate the prevalence of hypertension steel factories workers.
- To assess socio-demographic, behavioral and biological factors of hypertension among the steel factories workers.

4.0. Methods and Materials

4.1. Study Area

The study was undertaken in Akaki, a suburban industrial town, about 22 kilometers south of Addis Ababa Metropolis. Akaki town had two full functional health centers and one hospital, two university, and more than 150 small and large industrial plants, of which the steel factories among them, they were two steel factories found within woreda 1and 4. The factory produces industrial and household hardware products, and currently transferred to private -owner.

4.2. Study design and period

The study design employed was descriptive cross-sectional study design to assess the magnitude and associated factors of hypertension among adult workers of the steel factories, which was conducted between March to April 2013 in Akaki, Addis Ababa, Ethiopia.

4.3. Study population

4.3.1. Source Population

The Source populations were all steel factories in Akaki and all workers who worked in those factories. There were two iron processing factory in Akaki which was run by private owners Total numbers of workers in each 247 and 353 respectively. Eligible subjects used all workers in both factories.

The following criteria were applied in the selection of study subjects:-

- Eligible subjects were all workers in the factory who were under full-term and part time contracts at the factory.
- Workers who were less than 18 years of age excluded.
- Women who were Pregnant were excluded
- Disabled individuals were excluded.

4.3.2. Sampling method and Sample size determination

We used single proportion formula for calculating our sample size: $n = Z(\alpha/2)2 \frac{p(1-p)}{d2}$

Based on the past study in Addis Ababa, prevalence was assumed to be 27% (25) and marginal error of 4% with 95% confidence level:

Precision (d) =0.04 then, the sample size (n) =473

Non-response rate (5%) = 24

Total Sample size = 497

As there were a total of 600 workers in the two steel factories, we used all of them to participate in the study.

4.4. Data Collection methods

4.4.1. Data collection tools

As recommended in the WHO STEP wise Approach guidelines on NCD risk factor surveillance, the survey comprised:

1) Use of structured questionnaires, to assess the socioeconomic, demographic and behavioral characteristics of the study subjects, which might put them at risk of hypertension and related disorders.

2) Physical measurements such as, blood pressure, height, weight, waist and hip circumference of all study subjects, using standard calibrated instruments (36).

4.4.2. Data collection procedures

Prior to data collection, permission was sought and obtained from the factory management, to carry out the survey at the factories. Workers were then sensitized about the proposed study through the clinic staff and each department workers head, to ensure maximum participation.

Data was collected using a combination of a structured questionnaire and physical measurements of weight, height and Blood Pressure (BP). The scope of the present study was limited to behavioral and physical measurements, and did not include biochemical measurements. For this purpose four clinical nurses were included to conduct the data collection and a supervisor was supervised those data collectors. Training, practical demonstrations on interview techniques and measurement procedures were given to data collectors for two consecutive days.

We used a modified form of the WHO Global Risk Factor Surveillance Questionnaire (36).The questionnaire was pretested on 5% of the study participants found outside of the study area and modifications were made on the basis of the findings. The questionnaire was translated from English to Amharic and then back to English to check for consistency.

Weight measuring scales were checked and adjusted at Zero level between each measurement with participants standing without shoes and wearing light clothing .Weight was recorded to the nearest 100gram. Heights of subjects were measured to the nearest 0.5centimetres, using a standard stadio meter with subjects standing in the upright position and without shoes on their feet. To ensure that an upright position was maintained, each subject was told to stand tall, looking straight forward, while the data collector positioned the head, so that the temporo-mandibular joint was at level with the eye and both heels on the ground, before taking the height measurement.

To Participant Blood pressure was measured twice in a sitting position using standard mercury sphygmomanometer BP cuff with the appropriate cuff size that covers two-thirds of the upper arm after the participant rest for at least five minutes and no smoking or caffeine 30 minutes before measurement. The second measurement was taken five-to-ten minutes after the first measurement if the first measurement inclination to hypertension. Finally, the two BP measurements used to determine the status of the participant.

Body-mass index (BMI) was calculated as weight in kilograms over height in meters squared [weight (kg)/ (height (m)) 2].

Waist circumference was measured at the level of the iliac crest using a non-elastic tape measure. Hip circumference was measured at the maximum circumference of the hip. Waist-to-hip ratio (WHR) was calculated as a ratio of waist and hip circumference.

The global physical activity questionnaire section of the STEPS instrument was used for assessment of physical activity. The instrument looks into three major domains of day-to-day activities; work (including domestic work), transport, and recreational activities. Level of total physical activity was subsequently classified into high, moderate, or low using the analysis guideline provided along with the STEPS instrument (36).

4.4.3. Variables

Dependant Variables

- Presence or absence of Hypertension

Independent variables

Socio-demographic variables:

Age, gender, ethnicity, religion, marital status, family history of hypertension, height, weight, body mass index (as an index of obesity), waist and hip ratio (as an index of central obesity), systolic and diastolic pressures and sedentary lifestyle (physical inactivity).

Socio-economic variables:

Occupation, monthly income, highest education attained, history of smoking, alcohol

Operational definitions of Terms

- **Hypertension -** the average of casual systolic blood pressure readings ≥140 mmHg and/or diastolic pressure readings ≥ 90mmHg (9).
- **Epidemiological transition -**the shift from a pattern of high prevalence of infectious diseases associated with malnutrition, and periodic famine and poor environmental sanitation, to a pattern of high prevalence of chronic diseases associated with urban–industrial lifestyles.
- **Demographic transition** -the shift from a pattern of high fertility and high mortality to one of low fertility and low mortality.

- **Obesity -** a body mass index (BMI) ≥30.0 kg m-2.
- **Overweight -** a BMI ≥25.0 but less than 30.0 kg m-2.
- **Central Obesity -** A waist-to-hip ratio (WHR) greater than 1.0 in men or greater than 0.85 in women (36).
- **Sedentary lifestyle** (Physical inactivity) – In this study is measured as a response of being always or usually engaged in light/leisure activities for most days of the week, or a response of sometimes/never engagement in moderate to intense physical activity outside work for most days of the week, that would add up to at least three hours per week of moderate to intense (vigorous) physical activity (36).
- **Positive Family History of Hypertension** - is a reported history of hypertension in the father, mother, full brother or sister, or the respondent.
- **Heavy Alcohol Consumption** - Refers to the average consumption of more than 5 standard alcoholic drinks per day for men (≈50gm of alcohol) or >4 alcoholic drinks (or 40gm alcohol) for women. A standard alcoholic drink is the equivalent of one glass/can/bottle (330ml) of regular beer (with 3% ethanol), one glass (100ml) of wine (10% ethanol) or one glass or measure (40ml) of distilled spirit, each of which adds up to about 10g of ethanol per drink (36).

4.4.4. Data Quality Assurance

Quality of data was assured through the following methods:

- Use of structured questionnaire, which was translated into Amharic language and pre-tested before the actual survey.
- Intensive training of data collectors a week prior to commencement of actual survey.
- Active participation of the principal investigator in the data collection process as well as regular supervision of other data collectors.
- Checking of questionnaires at the end of each day of data collection, for consistency, completeness, clarity and accuracy.

4.5. Data processing and analysis

Data coding was done at the end of each day of data collection and recoded later where necessary. Data were entered into the computer using EPI info version 3.5.1 statistical package, which was also used to clean the data. Frequencies and random independent checks were used to check for accuracy of data entry. Frequency distributions, percentages, tables and charts were used to show results of univariate analysis. Cross tabulations, chi-square tests, p-values, odds-ratios and 95% confidence intervals were used to present results of bivariate analysis. Multivariate analysis was done on SPSS, version 20.0 statistical package, using the logistic regression models to control for potential confounders in the analysis. For the purpose of this study, statistical **significance was defined at a probability level of 0.05 ($p<0.05$).**

4.6. Ethical consideration

Ethical clearance was taken from the University of Addis Ababa, school Public Health, Ethics Review Committee before planning and starting data collection. After explaining the purpose of the study in detail to the study participants and informing them that they had a full right to cooperated and participated. Maximum effort was made to maintain privacy and confidentiality during data collection and analysis period. They could also decline if they don"t want to participate in the study. Official letter was given for concerned bodies and Permission letter was taken from Addis Ababa administration office and like. Confidentiality of the information was assured from all the data collectors and principal investigators side. Participants having raise blood pressure by our measurement were referred to nearby health facilities for further diagnosis and treatment.

5. RESULTS

5.1 Socio-demographic characteristics

A total of 501 subjects of ages 18-68 years, participated in the study out of the total workers at the factories. From the total, 189 (37.7%) had elevated blood pressure, of whom, 41 (22.0%) were aware of their hypertension status and 148 (78.3%) did not know of their condition.

Table 1 showed distribution of the socio-demographic characteristics of the study population. Of the total respondents, 434 (86.6%) were males and 67 (13.4%) were females, with a male to female ratio 7:1.

The age of the study subjects ranged from 18 to 68 years. The age group of 45-54 years accounted for 193 (38.5%) study subjects. Respondents in the age group 35-44 years constituted the second largest group with 131 (26.1%), while those aged 25-34 years were 61 (12.2%). Persons aged 45 years and above made up the highest proportion of subjects in the population, with 286 (57.1%) subjects (Table 1).

Concerning Ethnicity, Amhara accounted for 223 (44.5%) of the study population, followed by Oromo 211 (42.1%) and other ethnic groups combined, made up 67(13.4%) of the total study population. Four hundred nineteen (83.6%) of the study subjects belonged to the Orthodox Christian religion, 54(10.8%) were Protestants and 28 (5.6%) were Muslims and people of other religions (Table 1). Three hundred eight nine (77.6%) of study subjects were married, 72 (14.4%) were single and 40 (8.0%) were either divorced or widowed.

Four hundred seventy seven (95.2%) had some formal education, and those with no formal education constituted 24 (4.8%) of the study population. Of those with formal education, 120 (24.0%) subjects had post-secondary or higher education, 155 (30.9%) secondary, and 202 (40.3%), primary education (Table1).

The description of the job categories of the workers was closely linked to their income level, according to information obtained from the factory. Income described by the respondents, below 1000 Birr made up of 114 (22.8 %) subjects , earning between 1000 and 2500 Birr per month,

constituted 273 (54.5%) of the workers, and above 2500 Birr, were only 114 (22.8%). The median monthly income of the respondents was calculated to be 1925 Birr.

One hundred thirty (25.9%) of study subjects had a family history of hypertension, 232 (46.3%) had no such history and 139 (27.7%) of them they did not know whether they had or not (Table 1).

Table1 Socio-demographic characteristics of the study subjects at steel factories in Akaki, Addis Ababa, Ethiopia. July-August 2013 (n501)

Characteristics		**No of subjects**	**% of study subjects**
Sex	Male	434	86.6
	Female	67	13.4
Age group(yrs)	18-24	23	4.6
	25-34	61	12.2
	35-44	131	26.1
	45-54	193	38.5
	≥55	93	18.6
Ethnicity	Amhara	223	44.5
	Oromo	211	42.1
	Others	67	13.4
Religion	Orthodox	419	83.6
	Protestants	54	10.8
	Others	28	5.6
Marital status	Single	72	14.4
	Married	389	77.6
	Others	40	8.0
Educational status	No formal edu	24	4.8
	Primary	202	40.3
	Secondary	155	30.9
	Postsecondary	120	24.0
Income(ETB)	<1000	114	22.8
	1000-2500	273	54.5
	≥2500	114	22.8
Median income	1925birr		
Family history of Hypertension	yes	130	25.9
	no	232	46.3
	don't know	139	27.7

5.2. Behavioral characteristics of study subjects

Table 2 depicts a description of behavioral characteristics of the study subjects.

Overall, 51(10.2%) of the respondents reported ever having smoked cigarettes in their lifetime, but only 40 (78.4%), are current smokers and the smokers in this study are males. Thirty eight (95.0%) of the current smokers have been smoking for over 10 years and the remaining 2 (5.0%) for up to10 years. The number of cigarettes smoked ranged from 1.0 to 20 sticks per day with a mean of 8 cigarettes /day. Fifty nine (11.8%) respondents have ever used ' khat' and all are males. Among the study subjects, 412 (82.3%) reported ever consumed one or more alcoholic drinks per day. Heavy alcohol consumption was however found in 66 (58.4%) of regular drinkers or 13.2% of the total study subjects. Only males were found to be engaged in heavy alcohol consumption (Table 2). Out of the total study respondents, 205 (40.9%) reported that they regularly have moderate to intense physical activities, at least three hours per week, and 296 (59.1%) did not. A higher proportion of females compared to males (82.1% versus 55.5%) did not have regular physical activity.

5.3. Biological risk factors

The body mass index (BMI) of the respondents ranged from 15.4 to 36.5 kg m-2, with a mean of 23.6 ±3.5 kg m-2. The mean BMI of the male respondents was found to be (23.5 ±3.3 kg m-2), whereas that of the female respondents was 24.1 ±4.4 kg m-2. Overall, 338 (67.5%) of subjects had BMI <25.0 kg m-2, and 163 (32.5%) of respondents had BMI ≥25.0 kg m-2. One hundred forty five (28.9%) subjects were overweight and 18 (3.6%) were obese (Table2). In addition, higher proportions of females than males were overweight (29.9% versus 28.8%), and a higher proportion of females, were obese (9.0 % females versus 2.8% males).

The mean waist-hip-ratio (WHR) of the respondents was 0.9 ±0.1 for men and 0.9 ±0.1 for women. Overall, 59 (13.6%) men and 30 (44.8%) women had central obesity (as defined by the WHR) or 89 (18.0 %) of the total study subjects (Table 2).

The mean systolic blood pressure of the study population was 124 ± 21.0 mmHg, while the diastolic mean was 79 ±12.1 mmHg. Analysis of the blood pressure by age, showed that the mean blood pressure (both systolic and diastolic), was highest in age group ≥55 years.

Among the study subjects, a total of 189 (37.7%), 95% confidence level (30, 40%) had hypertension. The prevalence of hypertension in the study subjects was also found to increase with age. Prevalence of hypertension in males was 174 (40.1%) and among females were 15 (22.4%) (Table2).

There was some variation in the prevalence of systolic and diastolic hypertension in the study population, 143 (28.6%) subjects had systolic hypertension and 136 (27.2%) had diastolic hypertension (Table 2).

Table 2 Behavioral and biological factors among study subjects at steel factories in Akaki, Addis Ababa, Ethiopia. July-August 2013 (n501).

Characteristics		No of subjects	(%) Study subjects
Ever smokers	Yes	51	10.2
	No	450	89.8
Current smokers	Yes	40	78.4
	no	11	21.6
Ever users of khat	Yes	59	11.8
	no	442	88.2
Regular alcohol consumption	Yes	113	22.6
	no	388	77.4
Heavy alcohol consumption	Yes	66	58.4
(n113) **	no	47	41.6
Sedentary lifestyle	Yes	205	40.9
	no	296	59.1
Categories of body mass index	Normal	338	67.5
	Overweight	145	28.9
	Obesity	18	3.6
Central obesity	Yes	89	18.0
	no	412	82.0
Systolic hypertension	Yes	143	28.5
	no	358	71.5
Diastolic hypertension	Yes	136	27.2
	no	365	72.8

Normal (<25.0 kg/m2) **Overweight** (25.0-29.9 kg/m2) **Obesity** (≥30 kg/m2)

* Denominator is no. of current smokers

** Denominator is no. of regular drinkers

5.3. Distribution of hypertension by socio demographic characteristics and behaviors

In bivariate analysis of the socio-demographic variables with hypertension, age was found to have statistically significant association with the odds of hypertension among 35-44 was, COR= 6.3, 95% CI (1.4, 28.0), for age group 45-54, COR=7.1, 95% CI (1.6, 32.2), and those ≥55, COR= 12.0, 95% CI (3.0, 53.0), compared to the young age group 18-24 years. Family history of hypertension had significant association with hypertension. Those who had history of familial hypertension were about 3 times more likely to have hypertension, COR=2.7, 95% CI (2.0, 4.0), than those with no family history of hypertension. Males were more likely to be hypertensive, COR=2.3, 95% CI (1.3, 4.2), than females (Table 3).

Marital status was found to be statistically significant association with odds of hypertension, for those married study subjects had, COR=2.7, 95% CI (1.5, 5.0), more likely hypertensive compared to unmarried study subjects. Being educated had more likely to have hypertension, COR=5.0, 95% CI (1.4, 18.2), than illiterate (Table 3).

An increase in the odds of hypertension with increasing income level was noted in the bivariate analysis, and it was statistically significant. Those who earned between 1000-2500 birr, COR=2.0, 95% CI (1.2, 3.1), and >2500 birr, COR=2.4, 95% CI (1.4, 4.1), were more likely having hypertension compared to those earned less than one thousand. Ethnicity and religions did not show any statistically significant association with the odds of hypertension in the study population.

Table 3 Elevated blood pressure among respondents by socio demographic factors at steel factories in Akaki, Addis Ababa, Ethiopia. July-august2013 (n501)

Characteristic		**Presence of hypertension**		**COR(95%CI)**
		Yes # (%)	**No # (%)**	
Age	18-24	2(8.7)	21(91.3)	1.0
	25-34	11(18.0)	50(82.0)	2.3(0.5,11.3)
	35-44	49(37.4)	82(62.6)	6.3(1.4,28.0)*
	45-54	78(40.4)	115(59.6)	7.1(1.6,32.2)*
	≥55	49(52.7)	44(47.3)	12 (3.0,53.0)*
Sex	Male	174(40.1)	260 (59.9)	2.3 (1.3,4.2)*
	Female	15(22.4)	52 (77.6)	1.0
Marital status	Single	15(20.8)	57(79.2)	1.0
	Married	163(41.9)	226(58.1)	2.7 (1.5,5.0)*
	Others	11(27.5)	29(72.5)	1.4 (0.6,3.5)
Educational status	literate	186(39.0)	291(61.0)	5.0 (1.4,18.2)*
	Illiterate	3(12.5)	21 (87.5)	1.0
Job description	Level one	31(27.2)	83(72.8)	1.0
	Level two	111(40.7)	162(59.3)	1.8 (1.1,3.0)*
	Level three	47(41.2)	67(58.8)	2.0 (1.1,3.2)*
Income	<1000ETB	28(25.5)	82(74.5)	1.0
	1000-2500ETB	107(39.6)	163(60.4)	2.0 (1.2,3.1)*
	≥2500ETB	54(44.6)	67(55.4)	2.4 (1.4,4.1)*
Family history of hypertension	yes	72(55.4)	58(44.6)	2.7 (2.0,4.0)*
	No	117(31.5)	254(68.5)	1.0

*Denotes statistical significance

Among the behavioral characteristics, being overweight was found to be positively associated with the odds of hypertension. Those who had body mass index greater or equal to 25 kg/m2 more likely to have hypertension, COR=3.3, 95% CI (2.2, 4.9),than those with BMI lower than 25kg/m2.

Similarly, positive association was found for regular alcohol drinkers. Using alcohol regularly had more chance to develop hypertension than non drinkers and irregular drinkers, COR=3.9, 95% CI (2.2, 6.4), (Table 4).

Based on WHR classification males with central obesity more likely to have hypertension than males with no central obesity, COR=0.4, 95% CI (0.2, 0.7), and females those with central obesity were more likely to be hypertensive than females no central obesity, COR=0.3, 95% CI (0.1, 0.8), (Table 4).

Other behavioral variables such as smoking, 'khat' chewing and sedentary lifestyles did not show any significant associations with hypertension in the study subjects (Table 4).

Table 4 Elevated blood pressure among behavioral risk factors at steel factories in Akaki, Addis Ababa, Ethiopia. July-august2013 (n501)

Characteristic			**Presence of hypertension**		**COR(95%CI)**
			Yes # (%)	**No # (%)**	
Ever smokers		Yes	25 (49.0)	26 (51.0)	1.7 (0.9,3.0)
		No	164 (36.4)	286 (63.6)	1.0
Current smokers		Yes	18 (45.0)	22 (55.0)	0.5 (0.1,1.8)
		No	7 (63.6)	4 (36.4)	1.0
Ever drinkers		Yes	172 (41.7)	240 (58.3)	3.0 (1.7,5.3)*
		No	17 (19.1)	72 (80.9)	1.0
Heavy alcoholism **		Yes	36 (54.5)	30 (45.5)	4 (2.1,7.1)*
(n113)		No	25 (53.2)	22(46.8)	1.0
Regular alcohol drinkers		Yes	61(54.0)	52 (46.0)	3.9 (2.2,6.4)*
		No	92 (39.0)	144(61.0)	1.0
Sedentary lifestyle		Yes	108 (36.5)	188 (63.5)	0.9 (0.1,1.3)
		No	81(39.5)	124 (60.5)	1.0
Overweight		Yes	84(57.9)	61(42.1)	3.3 (2.2,4.9)*
		No	105(29.5)	251(70.5)	1.0
Obesity		Yes	10 (55.6)	8 (44.4)	0.5 (0.2,1.2)
		No	179 (37.1)	304(62.9)	1.0
Central obesity	**Male**	Yes	36 (61.0)	23 (39.0)	0.4 (0.2,0.6)*
		No	138 (36.8)	237 (63.2)	1.0
	Female	Yes	5 (16.7)	25 (83.3)	0.3 (0.1,0.8)*
		No	10 (27.0)	27 (73.0)	1.0

*Denotes statistical significance

** Denominator is no. of regular alcohol drinkers

5.4. Factors associated with hypertension

Using binary logistic regression analysis, age group ≥55 years, proved to have an independently significant association with hypertension among the study subjects. Persons in the age group ≥55 years were found to be 6 times at more risk of having hypertension than 18-24 years of age, AOR = 6.3, 95% CI (1.2,33.4),(Table5).

A family history of hypertension also showed an independent association with hypertension. Respondents with a positive family history were found to be almost two and half times at more risk of having hypertension, than those without such a history, AOR = 2.5, 95% CI (2.0,4.0) (Table 5).

Respondents who were literate found to be more likely at risk of having hypertension, AOR= 4.5, 95% CI (1.3, 15.2), than those illiterate. Although gender and marital status showed significant association with hypertension in the bivariate analysis, the variables were not statistically significant on the logistic regression analysis.

Other socio-demographic variables did not show independent significant associations with hypertension, when binary logistic regression analysis was applied (Table 5).

Among the behavioral factors of the study subjects, regular alcohol drinkers were found to be two times at high risk of having hypertension, AOR=2.1, 95% CI (1.3, 3.2), than non-drinkers and heavy alcohol drinkers were found to be three times at high risk of having hypertension, than regular alcohol drinkers, AOR= 3.0, 95% CI (1.5, 5.6). Obesity, AOR=3.3, 95% CI (1.1, 10.2), had significant association with hypertension. Overweight, AOR=3.0, 95% CI (2.1, 5.1), also was found to have an independent association with hypertension. Respondents who were overweight were found to be three times more likely to have hypertension than non overweight respondents

History of smoking, sedentary lifestyle and ‘khat’ chewing was not independently associated with hypertension in this study subjects, using logistic regression (Table 5).

Table 5 Predictors of elevated blood pressure at steel factories, Akaki, Addis Ababa.July-August2013 (n501)

Characteristic		COR (95%CI)	AOR (95%CI)
Gender	Male	2.3(1.3,4.2)*	0.7(0.3,1.6)
	Female	1.0	1.0
Age	18-24	1.0	1.0
	25-34	2.3 (0.5,11.3)	1.5(0.3,8.0)
	35-44	6.3 (1.4,28.0)*	3.6(0.7,18.2)
	45-54	7.1 (1.6,32.2)*	4.0(0.8,20.0)
	≥55	12 (3.0,53.0)*	6.3(1.2,33.4)*
Educational status	Literate	5.0(1.4,18.2)*	4.5(1.3,15.2)*
	illiterate	1.0	1.0
Income	<1000	1.0	1.0
	1000-2500	2.0 (1.2,3.1)*	1.3(0.3,6.0)
	>2500	2.4 (1.4,4.1)*	1.2(0.2,6.0)
Marital status	Single	1.0	1.0
	Married	2.7 (1.5,5.0)*	1.6 (0.7,3.5)
	Others	1.4 (0.6,3.5)	0.9 (0.3,2.8)
Family history	yes	2.7 (2.0,4.0)*	2.5 (2.0,4.0)*
	no	1.0	1.0
Current smokers	yes	0.5 (0.1,1.8)	0.4 (0.1,2.5)
	no	1.0	1.0
Regular alcohol drinkers	Yes	3.9(2.2,6.4)*	2.1(1.3,3.2)*
	no	1.0	1.0
Heavy alcohol drinkers **	yes	4.0 (2.1,7.1)*	3.0 (1.5,5.6)*
	no	1.0	1.0
Khat chewing	yes	0.4 (0.1,2)	0.4 (0.1,1.7)
	Yes, not daily	1.0 (0.6,2)	0.9 (0.5,1.7)
	no	1.0	1.0
Sedentary life style	yes	0.9 (0.1,1.3)	1.6 (0.7,3.5)
	no	1.0	1.0
Overweight	yes	3.3 (2.2,4.9)*	3.0 (2.2,5.8)*
	no	1.0	1.0
Obesity	yes	0.5 (0.2,1.2)	3.3 (1.1,10.2)*
	no	1.0	1.0

* Denotes statistical significance **Denominator is no of regular drinkers

6.0. Discussions

The study was designed in compliance with the WHO Stepwise Approach to Non communicable disease risk factors surveillance, namely, the initial establishment of a baseline population-based data indicating the prevalence and local determinants of NCDs lacking, as it currently the case in Ethiopia.

Overweight and obesity, including abdominal obesity, were more prevalent among females, while elevated blood pressure was high in both males and females. Around a half of the adult population has sedentary lifestyle. These can be explained by Urbanization which brings an increasing use of motorized transport and sedentary types of occupation such as office work. Also has influence on shifting dietary and lifestyle behaviors.

Our findings showed a considerably high prevalence of overweight among adults in steel factories. The 2011 Ethiopian Demographic and Health Survey (EDHS) study showed that women in Addis had the highest prevalence of overweight across the country. However, the figure (22.2%) was slightly lower than our estimate of 24.1%. Mean BMI in females was 24.1% in our study sample and 22.2% in the EDHS 2011 (32). Due to slightly differences in age composition and sample size could account for much of the differences in the estimates between the two studies.

The prevalence of hypertension in this study population is high (37.7%) compared to a community-based study conducted in Gonder with the prevalence of 28.3 % (26). A study conducted Gilgel Gibe Field Research Center reported that the specific observed prevalence was 2.6% for hypertension (28). A study in Eritrea reported that the prevalence of hypertension in the general population was 16% (24). The higher prevalence of hypertension found in our study, might be explained in part by the criteria for diagnosis, in which the current WHO cut-off level of 140/90 mmHg was used, as against the former level of ≥160/90 mmHg, used in those studies (9). It also might be related with work related stress. A study done in Ghana showed that the prevalence of hypertension ranged from 19 to 48% between studies (20). Prevalence of hypertension was lower than those reported from population based studies 55.9% (13). Using binary logistic regression analysis, only the age group ≥55 years, proved to have an independent significant association with hypertension. A significant increase in the prevalence of

hypertension with age, for both male and female respondents was observed in this study. Age group ≥55 years were found to have a significant positive association with hypertension, even after adjusting for confounders, which has been confirmed in previous studies, both within and outside Ethiopia (11, 19- 21, 24 and 30).

There was no significant gender variation in the prevalence of hypertension in the study subjects. This is inconsistent with reports from many studies on hypertension in different parts of the world, like study done in Vietnam (11). Respondents with a positive family history were found to be almost two and half times at more likely to have hypertension, than those without such a history, adjusted for other variable which was also shown by other study (3).

Being literate had significant association with hypertension, than illiterate respondents, after adjusted for other variable. This may be due to stress and increase their income levels which bring changing their way of life.

Heavy alcohol consumption and overweight were significantly association with hypertension. Studies also reported similar findings (14, 21, 23-24).

Although history of smoking, sedentary lifestyle 'khat' chewing and religion, socio economic status were independently associated with hypertension in many studies, no such association were found in this study (28). This may be due to the low prevalence of these factors in the study subjects.

6.1. Strength and Limitation of the study

Strength of the study

Among the strengths of this study are:

- The survey involved the whole study population, which allowed for greater precision as compared to taking a sample of the population of interest.
- It followed the WHO Stepwise approach to NCDs risk factor surveillance studies in a given population. The survey used a modified version of the standard WHO risk factor questionnaire.
- It utilized several data quality control measures such as careful training of data collectors recruited as qualified health professionals (nurses and health assistants) who were already familiar with the process.
- It utilized calibrated measurement instrument (by ISO).

Limitation of the study

Some of the limitations of this research include the following:

- It was a restricted population survey with a relatively small sample size, which has inherent sampling bias that makes it difficult to generalize the findings to the Ethiopian population as a whole. However, it can be applicable to similar factory or urban working populations in the country.
- The comparatively smaller proportion of female workers at the factory made it difficult to adequately assess the actual prevalence of hypertension in a female factory population.
- It involves only anthropometric and blood pressure measurements but not used bio chemical tests due to cost, time consternates.
- WHO definition of heavy alcohol drinkers does not differentiate locally prepared alcohols.
- Woman might not tell us if they drink too much alcohol because, it is culturally unacceptable.

6.2. Conclusion and Recommendation

Conclusion

This study has found a prevalence of hypertension that are higher than previously reported in urban populations in the country, but comparable to similar populations in other parts of Africa. Strong family history, advancing age, regular alcohol drinkers, overweight was observed as significant risk factors for the prevalence of hypertension in the studied population.

Recommendations

From the findings of the study, the following recommendations are suggested:

- health education and promotion of regular physical exercise should established through the factory clinic to help decrease the high prevalence of some of the modifiable risk factors like overweight and heavy alcohol drinkers observed in this study.
- Screening of high-risk urban and suburban working populations can be undertaken as a means of early intervention.
- A broader population-based survey is needed to adequately assess the national prevalence and burden of hypertensions as well as explore the interactions of the various risk factors observed in this study.
- A longitudinal study to follow-up on the direction and magnitude of trends in hypertension and risk factor prevalence and incidence, as well as to plan or evaluate health promotion or preventive strategies, should be set up.

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Annex

Sample of English Questionnaire used in survey

Respondent's code number------

Assessment of Hypertension Prevalence and its Associated Factors among Workers at the steel factories, Akaki, Ethiopia.

I am a member of the research team of Addis Ababa University, school of public health. I would like to request your participation in this study that will involve asking you some questions and conducting some tests. Before we proceed, I will request you to listen carefully to what I am going to read to you about the Purpose of this study and what it involves and tell me whether you are willing to participate in this research or not.

CONSENT FORM

-The purpose of this study to find out how many of factory workers has hypertension

- To detect and early management of hypertension and get rid of complication related to hypertension

The survey is made up of two parts:-

1. We ask you some questions that have been found to be associated with the disease.
2. We will take your measurements such as weight, height and blood pressure.

We would like to assure you that the information obtained will be strictly for our research use and you your employer will be informed of the test result. Your name will not be used in our report and the information obtained will not be used in any way that will identify you. The interview is voluntary. Your participation/ non-participation, or refusal to answer questions will have no effect now or in the future on services that you or any member of your family may receive from health service providers.

Do you volunteer to participate?

Yes……..

No……..

Step 1 Socio demographic Information of Respondent			
no	Questions	Alternative Choices for Response	code
1	Sex	1.Male 2.Female	
2	Age(enter number)	…..years	
3	Date of birth	…./…./….Day/Moth/yr(Ethiopian calendar)	
4	Religion	1.Orthodox Christian 2. Protestant 3. Catholic 4. Moslem 88. Other, specify…..	
5	To which ethnic group do you belong?	1. Amhara 2. Oromo 3. Tigre 4. Gurage 88. Other, specify ----------	
6	Marital status	1.Never Married (single) 2.Currently Married 3 Separated 4.Divorced 5.Widowed	
7	Education status	1. Literate (can read and write) 2. Illiterate (cannot read and write) ------	
8	If literate, highest level of completed education	----------(Grade	

9	What is your job description at this factory?			
10	What is your family‟s total monthly income	1. ---------- Birr 2. Don‟t know		
11	**About your family's medical history**. Do you or any first-degree relative∗ of yours suffer from any chronic disease such as hypertension or diabetes	1. Yes 2. No 3. Don‟t know		
12	If yes to On 11, specify which relative(s) and nature of disease(s) from the following	Relative	Nature of Disease	
	If yes to 11, specify which relative(s) and nature of disease(s) from the following			

∗**A first-degree relative refers to: your actual father/mother (not step-), full brother/sister and full child.**

Risk behaviors **Smoking or Tobacco Use**			co de
14	Have you ever smoked on a regular basis?	1.Yes, daily 2.Yes, but not daily 3.No, never daily	
15	Do you currently smoke any tobacco product such as cigarettes, cigars, or pipes	1. Yes 2. No	
16	When did you start smoking daily?	1. Since the last---------years	

	(Select one answer only)	2. Since the last--------months 3. Since the last--------weeks 4.On-----/------/-------Date (Day/math/yr**)** 5. At ----------years of age	
17	On the average, how many of the following listed items do you smoke each day	1.--------no of factory-produced cigarettes per day 2. --------no of hand-rolled (local) cigarettes per day 3. --------no of local pipes („gaya") full of tobacco per day 4. ----------no of cigars per day 88.Other ------ (specify type ,and no per day) e.g."sisha	
18	Do you currently use smokeless tobacco Product such as snuff, chewing tobacco, etc?	1. Yes, daily 2. Yes, sometimes 3. No, not at all	
19	Do you chew Khat?	1. Yes, daily 2. Yes, sometimes 3. No, not at all	
20	Have you ever taken any type of alcoholic drink? (Beer, wine, spirit, „tella", „tej" etc	1. Yes 2. Yes, but not in the past 12 months 3. No, I have never	
21	In the past one month, how frequently have you taken at least one alcoholic **drink?** ∗This refers to one „standard drink"	1. 5 or more days a week 2. 1-4 days a week 3.Less than three days this month 4. Less than every month	
22	When you drink alcohol, what is your average consumption at a sitting	--------- (number of drinks	

25	**Work-related physical activity:** Firstly, how many hours do you typically spend at work each day?	---------no of hours	
26	During these hours, how frequently do you practice the following? (**Fill 1-4 from the response choices in the space provided**)	..	
	A. Mostly Sitting or Standing with only a short walking distance (mild exercise) **B**. Activities that require the same physical effort as walking long distance or backyard gardening (moderate exercise) **C**. Activities that require the same effort as lifting heavy weights or heavy construction work (heavy Exercise)	1. Always 2. Usually/Often 3. Sometimes 4. Never	
27	**How often do you use the following transportation methods on a typical day?** A. Private car or taxi B. Public transport such as city bus, factory bus, minibus or train C. Motorbike or bicycle D**.** Walking (on foot) E.„Geri"(horse-drawn carriage)	1. Always 2. Usually/Often 3. Sometimes 4. Never	

28	**Outside the working hours or transportation time, how often do you practice the following activities?** A. Mostly Sitting or Standing with only a little walking ---- B. Activities that require the same effort as walking long distance, or backyard gardening, or climbing upstairs ------ **C.** Activities that require the same effort as lifting heavy weight or strenuous exercise	1. Always 2. Usually/Often 3. Sometimes 4. Never If answer to Qn 28 is always (1) or often (2) Specify the time spent on these activities.	
Step 2. Physical Measurements			
29	Blood Pressure (measured 2 times	1st ----------mmHg (systolic/diastolic) 2nd ----------mmHg (systolic/diastolic)	
30	Height (measured 2 times)	----------cm	
31	Weight (kg)	----------Kg	
32	Waist circumference	---------- cm	
33	Hip circumference	---------- cm	

<u>የአማርኛ መጠይቆች</u>

መለያ ቁጥር/ኮድ/……

ይህ መጠይቅ በአቃቂ ቆርቆሮ ፋብሪካ ውስጥ ያሉትን ሰራተኞች ስለ ደም ግፊትና እና ተጎዳኝ የበሽታ ስርጭትን ለማወቅ የተዘጋጀ መጠይቅ ነው፡፡

ጥናቱን የሚያጠናው በ አ/አ/ዩ የማህበርሠብ ጤና ክፍል ውስጥ ተሳታፊ ስሆን ከዚህም በመቀጠል የእርሶን ተሳትፎ አስፈላጊ መሆኑ ጥናቱም ለድህረ ምረቃ የመመረቂያ ዉሑፍ ለማቅረብ ሲሆን ከየትኛውም ዓይነት ሥጋት ነፃ ሆነው መጠይቆችን በትብብር እንዲመልሱለን እንጠይቃለን፡፡ ይህ የጥናት መጠይቅ ጠቀሜታው ከእርሶ አልፎ ለሀአገሪቷ ከፍተኛ ግብዓት ሆኖ የሚያገለግል ሲሆን የእርሶ ግልፅ ተሳትፎ ወሳኝነት አለው ፡፡ በዚህ ተሳትፎ ፍቃደኛ ቢሆኑ ደስ ይለናል ፍላጎትዎ/ሽ ካልሆነ ያለመሳተፍ ሙሉ መብት አለህ /አለሽ፡፡

<u>የዚህ ጥናት ዓላማ</u>

- **የዚህ መስሪያ ቤት ሠራተኞች ምን ያህሉ የደም ግፊት እንዳለባቸው ለማወቅ፡፡**
- **ደም ግፊት ከሚያመጣቸው ተጓዳኝ ችግሮች ቅድመ መከላከል**

<u>ይህም ጥናት ሁለት ክፍል አለው</u>

የተወሰነ ከደም ግፊት የተያያዘ መጠይቆችን መጠየቅ

በባለሙያ የደም ግፊት ፣ክብደት፣ ቁመትን ፣መለካት

<u>ይህ ጥናት</u> - የግለሰቡ/የግለሰቧ ስም የማይጠቀስ መሆኑ

- በፍፁም በፈቃደኝነት ላይ የተመሰረተ መሆኑን

-ከድርጅቱጋር አሁንም ሆነ ወደ ፊት አንዳች ችግር በግለሰቡ ወይንም በግለሰቧ ላይ የማያመጣ መሆኑን እንድትረዱልን እፈልጋለሁ ፡

የስምምነት ፊርማ…..

ተ.ቁ	መጠይቅ	ምርጫ
1	ዕታ	1. ወንድ 2. ሴት
2	እድሜ	…..
3	የትውልድ ዘመን	…./…./…ቀን/ወር/ዓ.ም
4	ሐይማኖት	1.ኦርቶዶክስ 2.ፕሮቴስታንት 3.ካቶሊክ 4.መስሊም 77.ሌላ ካለ ይግለጹ……
5	ብሄር	1.አማራ 2.ኦሮሞ 3.ጉራጌ 4.ትግሬ 77.ሌላ ካለ ይግለጹ……
6	የጋብቻ ሁኔታ	1.ያላገባ 2.ያገባ 3.ብቸኛ 4.የፈታ 5.ሚስቱ ወይንም ባሏ የሞተችበት/ባት
7	የትምህርት ደረጃ	1.የተማረ (መዓፍም ሆነ ማነበብ የሚችል) 2.ያልተማረ (መዓፍምሆነማንበብ የማይችል) ከሆነ ጥያቄ ቁጥር 8 ይዘለል
8	የተማረ ከሆነ የትምህርት ደረጃ	……የትምህርት ደረጃ
9	በዚህ ድርጅት ውስጥ ያሎዎትን የስራ ድርሻ ይግለጹ?	……
10	በአጠቃላይ የቤተሰብዎ የወር ገቢ“ደሞዝ” ምን ያህል ነው?	1…….ብር 2.አይታወቅም

11	በርሶዎም ሆነ በቤተሰብዎ ውስጥ ድም ግፊት ወይም ስኳር ታማሚ አለ?	1. አለ 2.የለም ጥያቄ12ን ይዘለል 3.አይታወቅም	
12	መልሱ አዎን ከሆነ የበሽታውን ሁኔታ እና የቤተሰብ ትስስሩን ይግለጹ? 1.ድም ግፊት 2.ስኳር 3.አላውቀውም 77.ሌሎች (ካሉ በዝርዝር ግለጽ)	የቤተሰብ ትስስር	የበሽታውን ሁኔታ

13	ሲጃራ ታጨሳለህ/?	1.አዎን:አጨሳለሁ።። 2.አላጨስም።።ጥያቄ14/15/16/17ን ይዘለል
14	መልሱ አዎን ከሆነ መቼ ነውሲጃራ ማጨስ የጀመርከው?	1.ከ....አመተ ምህርትጀምሮ 2.ከ....ወር ጀምሮ 3.ከ....ሳምንት ጀምሮ 4.በ.../.../.../(ቀን/ወር/አመተምህረት) 5.በ.....እድሜ እያለሁ
15	ሲጃራ በየቀኑ ትጠቀም ነበር?	1.አዎን በየቀኑ 2.አዎን አልፎ አልፎ 3.አላጨስም
16	ባማካኝ በየቀኑ ምን ያህል ከተዘረዘሩትውስጥታጨሳለህ/ታጨሻለሽ ?	1. በቀን...በሩብሪካ የተመረተ ሲጃራ 2. በቀን...በእጅ የተጠቀለሉ ሲጃራ 3....ባካባቢው የተመረተ (ለምሳሌ “ጋያ”) 77.ሌሎች (ካሉ በዝርዝር ግለጽ)
17	ጭስ አልባ ሲጃራ ትጠቀማለህ /ሽ?	1.አዎን ፣በየቀኑ 2.አዎን ፣ አልፎ አልፎ

	(ለምሳሌ ፣የሚታኝክ)	3.አላጨስም ፣አጨሼ አላውቅም
18	ጫት ትቅማልህ?	1.አዎን ፣በየቀኑ 2.አዎን፣አልፎ አልፎ 3.በጭራሽ፣ቅሜ አላውቅም
19	አልኮል መጠጥተጠቅመህ ታውቃልህ? (ለምሳሌ ፣ ቢራ፣ወይን ጠጅ፣ጠላ፣ጠጅ)	1.አዎን 2.አዎን ፣ነገር ግን ባለፉት 12 ወር ውስጥ አልተጠቀምኩም 3.ተጠቅሜ አላውቅም ከሆነ መልሱ ጥያቄ ቁጥር20/21ን ይዘለል
20	ባለፉት 1ወር ውስጥ ከተዘረዘሩት መጠጦች ውስጥ ምን ያህል ጊዜ በድግግሞሽ አንዱን መጠጥ ተጠቀምህ ታውቃለህ?	1.በሳምንት ዉስጥ 5 ቀንና ከዚያ በላይ 2.በሳምንት ዉስጥ1-4 ቀን 3.በ ወር 3 ቀን 4.በ ወር ካንድ ያንስ ጊዜ
21	መቼ መቼ ነው አልኮል የምትጠቀምው እና ባማካኝ ባንድ ግዜ ምን ያህል ትጠቀማልህ ወይም ትጠጣለህ?	……..ያህል
22	በቀን ምን ያህል ሰአት ትሰራለህ/ሽ?	……ያህል ስአት
23	በዚህን ግዜ ከሚከተሉት ምርጫ ውስጥ የትኛውን የስራ አይነት በድግግሞሽ ትሠራለህ/ሽ?	
	ሀ.አብዛኛውን ግዜ በመቀመጥ ወይንም አንስተኛ የግር መንገድ ማድርግ ለ.ርጅም የግር መንገድ ማድርግ ሐ.ከባድ ስራ መስራት ወይም የጉልበት ስራ መስራት	1.ሁልግዜ 2.አብዛኛውን ግዜ 3.አልፎ አልፎ 4.በጭራሽ

24	የምትጠቀመው የመንገዣ አይነት ሀ.ታክሲ ወይም በግል መኪና ለ.በህዝብ መንገዣ ሐ.ሞተር ባይስክል መ.በግር ሠ.በጋሪ	1.ሁልግዜ 2.አብዛኛውን ግዜ 3.አልፎ አልፎ 4.በጭራሽ
25	ከስራ ክፍለ ግዜ ውጭ ከሚከተሉት ምርጫ ውስጥ የትኛውን የስራአይነት በድግግሞሽ ታሳልፋለህ ሀ.አብዛኛውን ግዜ በመቀመጥ ወይንም አንስተኛ የግር መንገድ ማድርግ ለ.ርጅም የግር መንገድ ማድርግ ሐ.ከባድ ስራ መስራት ወይም የጉልበት ስራ መስራት	1.ሁልግዜ 2.አብዛኛውን ግዜ 3.አልፎ አልፎ 4.በጭራሽ ለጥያቄ 25መልሶዎ 1.ሁልግዜ ወይንም 2.አብዛኛውን ግዜ ከሆነ ለምን ያህል ሰአት እንደሚቆዩ ይገለጹ?
26	የደም ግፊት መለካት	ሀ…….ሚሊሜትር ሜርኩሪ ለ…….ሚሊሜትር ሜርኩሪ
27	ቁመት መለካት	……..ሳ.ሜ
28	ክብደት መለካት	….. ኪ.ግ
29	የሆድን ዙሪያ መለካት	.... ሳንቲ ሚትር
30	የወገብን /የዳሌ ዙሪያመለካት	…. ሳንቲ ሚትር

Date:-17/12/2012

Name: - Berhanu Guchiye yimer

Cell phone:-+251-912-044147

E-mail:- berhanu_g8@yahoo.com

Addis Ababa, Ethiopia

Application to**:-**_____

Subject**:-**_____

I am graduated from Hawassa University with a bachelor of science in public health officer in 2006.From 2007 G.C then ward I am working in different hospitals with respected filed and I joined to nongovernmental organization JVMI AS MEDICAL profession with full interest to help my community. I have 6 years experience in this field and I have participated in data collection for USAID funded project by betezata plc. I have lots of trainings such as comprehensive HIV/AIDS care, infection prevention, paediatric HIV/AIDS, STIs training, research methodology, **IMNCI TOT (**training of trainer**)** and facilitated deferent training and now I am learning general public health in Addis Ababa university

Don‟t regret to contact me back with the above address for more information or further interview. Thank you for your time and consideration

Yours sincerely

BERHANU GUCHIYE YIMER

CURRICULUM VITAE

1. **PERSONAL INFORMATION**

1.1. NAME ----------BERHANU GUCHIYE YIMER

1.2. SEX ----------MALE

1.3. DATE OF BIRTH ----------APRILE13 1975EC

1.4. PLACE OF BIRTH----------ADDIS ABABA

1.5. MARITAL STATUS----------MARRIDE

1.6. NATIONALITY ----------ETHIOPIAN

1.7. HEALTH STATUS ----------HEALTHY

1.8. ADDRESS ----------BERHANU GUCHIYE

MOBILE-251-912-044147

HOME-251-111-560161

Email -berhanu-g8@yahoo.com/

ADDIS ABABA, ETHIOPIA

2. **LANGUAGE PROFICIENCY**

	SPEAK	**READ**	**LISTEN**	**WRITE**
2.1 AMHARIC	excellent	excellent	excellent	excellent
2.2 ENGLISH	excellent	excellent	excellent	excellent
2.3 OROMIFA	intermediate	intermediate	intermediate	intermediate

3.0. **EDUCATIONAL BACKROUND**

3.1. Kechena deberselam Elementary School (1982-1989EC)

1-6 Grades Certificate

3.2. Atse LibneDingil Elementary School (1990-1991 E.C)

7&8

3.3. Ethiopia Tikdem Higher Secondary School (1992-1993 E.C)

9-10 Grades Certificate & EGSEC

3.4. Yekatite 12 Higher Secondary & Preparatory School (1994-1995 E.C)

11-12 Grades Certificate & EHEECE

3.5. Hawassa University (1996-1998 E.C)

B.Sc in public health profession

THESIS ON-KAP on VCT in Dilla teacher"s Education, Gedio Zone, SNNPR, July 2006.

3.5.1. Addis Ababa University General Public Health, Masters Program

THESIS ON- Prevalence and associated factors of hypertension in Akaki steel factories Akaki, Addis Ababa .Ethiopia January 2014.

CERTIFICATES ON

- **HEALTH RESEARCH METHODOLOGY and ETHICS** training course organized by the Ethiopian public health association (EPHA), from June 16-25, 2010.
- **COMPRHENSIVE HIV CARE/ART** organized by AACAHB in collaboration with MSH/HCSP and the financial support from USAID November 9-dec 5, 2009.
- **CLINICAL NUTRITION CARE FOR CHILDREN AND ADULTS WITH HIV** organized by AACAHB in collaboration with MSH/HCSP, USAID, and AED/FANTA-2 held from December 6-8, 2009.
- **INFECTION PREVENTION** organized for health care providers by the EMA in collaboration with EPHA from august 3-7, 2009.

- **HIV PEDIATRIC ART TRAINING** conducted in Addis Ababa by EPS from august 24-28, 2009.
- **NATIONAL COMPRHENSIVE HIV CARE/ART** for adult and adolescent portion organized by HCSP, ARHB with the financial support from USAID, from June 9-21, 2008
- **TRAINING OF TRAINERS (TOT)** case management course on **INTEGRATED MANAGEMENT OF NEWBORN AND CHILDHOOD ILLNESS (IMNCI)** organized by ORHB/USAID/ESHE from January 21-26, 2007.
- **SYNDROMIC MANAGEMENT OF STIs** cases organized by ORHB in collaboration with REGIONAL HAPCO, 2007.

TRAINING ON

- **ESSENTIAL NUTRITION ACTION (ENA/BCC)** organized by USAID/ESHE
- **TB and LEPROSY** organized by ORHB

WORK EXPERIENCE

- Oromia Health Bearo North Shoa Fiche Hospital Head of MCH and adult OPD for Two &1/2Years then
- Addis Ababa RAS DESTA HOSPITAL adult OPD for Two years then
- I am working a clinician in Bete Hebert Yebego Aderagote Derejete (Non -governmental organization)

4. **INTERESTS**

4.1. Working in governmental and non- governmental organizations

4.2. Attending current affairs medical science and technology.

4.3. Mastering in public health medical science.

4.3. Support those who need my knowledge

4.4. Reading books and other sources of medical science.

5. **REFERENCE**

5.1. Dr Fikre Enquselsies (my advisor) (PhD) Addis Ababa University instructor
Mobile +251-912-459707

5.2. Dr. Adane (MD**), jvmi** (Josie voice ministries international) Ethiopia country director Mobile-+251-911-247661

5.3. Ato Andinet Ayele (BSC), ICAP ART mentor

Mobile +251-911-727966

5.4. Ato Fekermariam workagegne (BSC) Dic (drop in centre) coordinator

Mobile-251-911-943641

DECLARATION

I, the undersigning declare that this is my work and has never been presented in this or another university for graduation and that the source materials used in this thesis have been duly acknowledged.

Name: Berhanu Guchiye

Signature: _____

Place: Addis Ababa University School public health, Ethiopia

Date of submission: January, 2014

This thesis has been submitted for examination with my approval as a University advisor.

Name: Dr Fikre Enkusellasie

Signature: _____

Date of submission: January, 2014