

Preliminary Results

Survey of Non Communicable Diseases among Bank Employees and Teachers in Addis Ababa, Ethiopia



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Executive Summary

Background: Chronic non communicable diseases (NCDs), in particular cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases, account for 60% of all deaths globally, more than double the number of deaths caused by infectious diseases, maternal and prenatal conditions, and nutritional deficiencies combined. The global prevalence of NCDs is increasing at an alarming rate, with the majority of cases occurring in developing countries. The change in life style characterized mainly by behavioral, dietary and nutritional states are believed to contribute to increased burden of NCDs.

Methods A cross sectional study design was used. Study subjects were permanent employees in Commercial Bank of Ethiopia (CBE) and teachers in public schools in Addis Ababa. The study was conducted in accordance with the STEPwise approach of the World Health Organization (WHO) which has three levels: (1) questionnaire to gather demographic and behavioral information, (2) simple physical measurements, and (3) biochemical tests. Nurses and experienced data collectors were used in the data collection. The data was entered into EPI-Info 3.3.2 and analyzed using SPSS version 17.

Results: A total of 51 schools and CBE's branch offices were included in the study. Overall 2205 subjects (1316 men and 889 women) responded to the interview in the study. Among those 1983(89.5%) provided blood sample for biochemical tests.

Nearly 9 % of study subjects reported chewing khat. Ever use of khat was reported by 20.4% study subject. Current cigarette smoking was reported by 4.9% of the study subjects while 8.5% of were previous smokers. The majority (77.3%) reported alcohol consumption in their life time and nearly 20% of them reported daily or almost daily use of alcohol during the study period.

The anthropometric measures showed that more than 30% of the study participants were either overweight or obese. Three hundred eighty five (19.5%) of the study participants had hypertension. Five hundred ninety (27.8%) of the participants had never been measured their blood pressure.

The overall prevalence of diabetes was found to be 4.5%. Men were more likely to be hypertensive than women. Women had higher prevalence of hypercholesterolemia than men (40.7% vs. 36.8%). The overall prevalence of mental distress was 314(14.1%). Women had higher prevalence of mental distress than men (21.6% vs. 9.5%).

Conclusion and recommendations: Overall preliminary study findings call for behavioral interventions targeted on individuals to improve use of appropriate diet, engage in physical activity, and encourage cessation of substance use. Institutional support is also required to reinforce positive behaviors by their employees.

Background

Chronic non communicable diseases (NCDs), in particular cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases, account for 60% of all deaths globally, more than double the number of deaths caused by infectious diseases, maternal and prenatal conditions, and nutritional deficiencies combined[1-3]. The global prevalence of NCDs is increasing at an alarming rate, with the majority of cases occurring in developing countries [4]. By 2020, this figure is expected to rise to 70% [2,3]. Contrary to common perception, the burden of NCDs is worst in low- and middle-income countries where 80% of all chronic diseases occur[3]. As the epidemic advances, the social gradient also reverses with the poor becoming most vulnerable in both developed and developing countries[5]. The rise in NCDs is driven in part by significant changes in dietary habits, physical activity levels, and tobacco consumption worldwide as a result of industrialization, urbanization, economic development, and food market globalization [3].

The Prevalence of many of the known risk factors for NCDs has dramatically increased in developing countries along with societal and environmental changes [3,6,7]. High blood pressure, high blood cholesterol, overweight and obesity, and type II diabetes are among the major biological risk factors[3]. The behavioral risk factors include unhealthy dietary practices physical inactivity, increased tobacco consumption, and harmful use of alcohol [8]. Unhealthy dietary practices include high consumption of saturated fats, salt and refined carbohydrates, as well as low consumption of fruit and vegetables[3].

The current financial crisis and soaring food prices in low- and middle-income countries, where the average household spends up to 80% of disposable income on food, result in reduced consumption of healthy foods, like fruits and vegetables [9] and increased consumption of less expensive but more energy-dense and nutrient-poor diet. While widespread under nutrition persists in a large number of low- and middle-income countries, obesity is also fast emerging as a significant problem. Underweight children and overweight adults are now often found in the same households[10].

This is compounded by increased physical inactivity associated with urban life style changes in most developing countries. Previous studies have shown that the physically inactive have a 20% to 30% increased risk of all-cause mortality as compared to those who participated in 30 minutes of moderate intensity physical activity on most days of the week [11,12]. There is accumulating body of evidence that shows physical activity to be inversely associated with NCD risk [13].

There is a large body of epidemiologic evidence that identifies tobacco use as the number one cause of preventable premature death in low- and middle-income countries [14]. In the last 30 years, while smoking prevalence among adult men has declined from 50% to 30% in high-income countries, it rose from 34% to 50% in low- and middle-income countries. Further, prevalence of many of the other known behavioral risk factors

(smoking and alcohol consumption) for NCD have increased in the past few decades, in part due to increased psychosocial stress[15] .

While age-specific rates of deaths from NCDs are declining in many high income countries, the opposite has been observed in low and middle income countries; particularly in Sub-Saharan Africa. In the past few years, global health organizations have called out for acknowledgment of the devastating burden NCDs have placed upon countries worldwide and called for action. To this effect the World Health Organization (WHO) has recommended a Stepwise approach for NCD risk factor surveillance[3,16] . Stepwise approach consists of a sequential process involving gathering information on key risk factors using questionnaires (Step 1), simple physical measurements (Step 2), and, biochemical assessment on collected blood samples (Step 3)[16]. A study conducted in rural Ethiopia reported that NCD contribute to 27% of the burden of all disease[17]. It is expected that the contribution of NCD would significantly increase in urban areas of Ethiopia because of factors associated with urbanization[18].

Hypertension and diabetes mellitus are among the top two chronic diseases that are common in developing countries[19]. Since the limited material and human resources available in Ethiopia are directed towards efforts to combat infectious diseases, little is known about the magnitude and risk factors of these diseases in Ethiopia particularly in the urban working population[18]. The current study aims to obtain a baseline data for evaluating and monitoring burden and risk factors for NCDs among bankers and teachers in Addis Ababa Ethiopia using a modified WHO STEPs approach and other tools. The information collected will be used in design, implementation and impact assessment of potential interventions.

Objectives of Study

The specific aims of this pilot project include:

1. To determine the prevalence of chronic non communicable diseases (hypertension, type II diabetes mellitus, metabolic syndrome, migraine and depression) among bank employees and teachers in Addis Ababa
2. Identify biological risk factors for chronic NCD
3. Identify behavioral risk factors for chronic NCD
4. To determine social, psychological and environmental predictors of risk factors of chronic NCD among bank employees and teachers in Addis Ababa
5. To observe trends of NCDs and risk factors in urban workplaces in Addis Ababa

Methods and Materials

Study area: the study was conducted in Addis Ababa, the capital city of Ethiopia during December 2009 and January 2010. The study sites were Commercial Bank of Ethiopia (CBE) and public schools in Addis Ababa.

Study site profile: Previous studies conducted in Ethiopia have documented a high prevalence of NCDs particularly hypertension and diabetes among bank employees. A survey conducted among 2854 bank employees found the prevalence of hypertension to be about 13% [20]. Studies have further indicated that hypertension, diabetes, asthma, allergic rhinitis, nephrolithiasis and duodenal ulcers to be major causes of morbidity in the bank structure [20,21]. The Commercial Bank of Ethiopia (CBE) is one of the leading banks in Ethiopia with more than 7,000 employees in the country. In Addis Ababa, the CBE has 4,123 employees in its headquarters office and 42 branch offices.

In Addis Ababa there are 483 public, Private and missionary schools. A total of 17,000 teachers are working in these schools. The public schools have larger size of teachers and it is believed that the periodic collection of data from those working in public schools was convenient since the work force is relatively stable. In addition to accessibility and convenience of getting information from this group, unlike the Bank employers, no data is available on their chronic disease and risk status.

Rational for including the workplaces: The workplaces were selected based on the size of workforce, attrition /stability of workforce willingness to participate and readiness to be part in a follow up study.

Study design: a longitudinal study design with an initial cross sectional baseline assessment

Study population: current permanent employees of the CBE and teachers in government schools in Addis Ababa were included to be part of the study. Non teachers /administrative staff are excluded from schools.

Sample size and sampling technique: sample size for the study was calculated using WHO STEPS approach. Multistage sampling was used and stratification by institution was employed. A sample proportional to the population of each institution was distributed. From each of the selected locations, all employees were invited to participate. Individuals who contacted the research team were informed about the benefits and risks of the study and those who provided consent were recruited to participate in the study. The final study population consisted of 2207 individuals.

Data collection

Study Team: 20 data collectors participated in the study. The data collectors were college graduates/students with a substantial experience in data collection. They were trained for 5 days on contents of the questionnaire, data collection techniques, and on ethical conduct of human research. Ten nurses were recruited. They were responsible for physical/ anthropometric examinations and blood sample collections. They were trained for 3 days. The International Clinical Laboratories (ICL) was involved in training the nurses. They also received training on ethical conduct of human research. Facilitators were selected from the institutions where the study was undertaken. They were identified through consultation with heads of branch offices and schools. They were responsible for preparation of list of participants, preparation of interview/examination venues and sharing recruitment script. The study staff was reminded facilitators about the voluntary nature of participating in the research. In addition, research team members gave orientation to all potential research participants. Data collector interviewers and research nurses were provided training prior to the commencement of the study. The specific contents of the training include: Introduction to the study objectives, methods, instruments, data collection procedures, interviewing techniques, data quality issues, anthropometric measurement skills, blood pressure measurement, and procedures on blood sample collection. Reliability test was done to standardize the data collection efforts. The data collectors with lower rate of agreement (Cronbach's $\alpha < 0.8$) were retrained on the specific areas where they had lower rate of agreement with the researchers.

Data collection instruments

Structured Questionnaire: This study was conducted in accordance with the STEPwise approach of the WHO for NCD surveillance in developing countries. A STEP is a sequential process involving the collection of data on selected risks factors with a questionnaire and basic physical measurements. The STEPS approach has three levels and within each level, risk factor assessment is divided into core, expanded and optional modules. Other questions were added to supplement the STEPS questionnaire and reflect the local context. The approach has three levels: (1) questionnaire to gather demographic and behavioral information, (2) simple physical measurements, and (3) biochemical tests (schematic table provided on table 1).

Participants were interviewed by trained interviewers using the WHO STEPs structured questionnaire. Other questions were added to supplement the questionnaire and reflect the local context. The questionnaire was first written in English and then translated into Amharic by experts and was translated back in to English. The questionnaire was pilot tested among CBE employees and teachers prior to commencement of the study.

Blood pressure (BP) measurement: BP was measured by using a digital measuring device (Micro life BP A50, Micro life AG, Switzerland) with the participant sitting after resting for at least 5 minutes. BP was measured 3 times, with at least 3 minutes between consecutive measurements. In accordance with the WHO recommendation the mean systolic and diastolic BP from the second and third measurements were considered for analysis [16].

Anthropometric measurements: Participants were weighed using a solar-powered scale with an accuracy of ± 100 grams. Their height was measured using an adjustable wooden measuring board, specifically designed to provide accurate measurements (to the nearest 0.1 cm) [16].

In accordance with the WHO guideline waist circumference was measured with light clothing over a skin in a private place. The measurement was taken at the midpoint between the lower margin of the last palpable rib and the top of the iliac crest (hip bone). Hip circumference was measured at the point of maximum circumference over the buttocks [16].

Biochemical tests: Blood samples from participants were collected after 12 hours of skipping meals as recommended by the WHO. Standard infection prevention procedures were applied in collecting blood samples from participants. The collected aliquots of blood (12ml) were used to determine participants' fasting glucose concentrations and lipid profiles. Serum triglycerides (TG), total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), glucose and insulin were measured using standard procedures at the ICL in Addis Ababa, Ethiopia. ICL is one of the best equipped laboratories in Ethiopia and uses states-of-the-art techniques.

Table 1. Levels of measurement in WHO's STEP approach.

Step 1: Questionnaire	Step 2: Measurement	Step 3: Biochemical Test
<ul style="list-style-type: none"> • Socio-demographic characteristics • Tobacco smoke • Khat chewing • Other drug use • Physical activity • Fruit and vegetables consumption • Oil and fat consumption • History of HBP, T2DM • Mental health • Migraine • Family history of cancer • Violence 	<ul style="list-style-type: none"> • Weight and height • Hip circumference • Waist circumference • Blood pressure • Heart rate 	<ul style="list-style-type: none"> • Fasting blood sugar • Cholesterol • Triglycerides • HDL cholesterol • LDL cholesterol

Operational Definitions of Variables

Hypertension: For purposes of this study people with systolic blood pressure greater than or equal to 140 mmHg, or diastolic pressure greater than or equal to 90mmHg, or people with normal blood pressure who are taking antihypertensive drug therapy were classified as hypertensive. Classification of hypertension was determined according to Joint National Committee on Prevention, Detection, Evaluation and treatment of high blood pressure [22].

High Blood Pressure(HBP)	Systolic Blood Pressure. (mmHg)	Diastolic Blood Pressure (mmHg)
Normal	<120	<80
Pre-hypertension	120-139	or 80-89
Stage 1 hypertension	140-159	or 90-99
Stage 2 hypertension	≥ 160	or ≥ 100

Diabetes Mellitus: Diagnosed in participants with fasting glucose blood levels greater than or equal to 126 mg/dl (7.0mmol/l), or with normal glucose but under treatment (diet or medical) for diabetes. Fasting is defined as no caloric intake for at least 8 hours [23].

Metabolic Syndrome: Metabolic syndrome (MetS) is a constellation of metabolic abnormalities and an important risk factor of cardiovascular disease (CVD). Prevalence of MetS will be calculated in accordance with the Adult Treatment Panel III (ATP III) of the National Cholesterol Education Program and International Diabetes Federation (IDF) [24].

Hypercholesterolemia: Hypercholesterolemia is defined as either a serum total cholesterol concentration ≥ 5.18 mmol/L or answering affirmatively to the question

Obesity; Participant's body mass index (BMI) was calculated by expressing weight (kilograms) divided by height (meters) squared. The following classification of BMI proposed by WHO was used to classify subjects as lean (BMI < 18.5 kg/m²), normal (18.5-24.9 kg/m²), overweight (25.0-29.9 kg/m²), and obese (≥ 30 kg/m²), respectively [25].

Abdominal or central adiposity: This is measured using waist circumference and waist to hip ratio. The cut off point for central obesity is a waist circumference of ≥ 102 cm for male and ≥ 88 cm for female. Using waist to hip ratio, the cut off point for central obesity is ≥ 1 for male and ≥ 0.85 for female [26].

Low fruit and vegetable intake: daily consumption of fruit and vegetables less than five servings.

Smoking: Current and daily, weekly, or occasional consumption of cigarettes was asked. The following indicators were included in our study.

Current smoker: is reported current smoking at the time of the survey

Past smoker: is reported previous history of cigarette smoking but quit now

Non smoker: has no history of smoking cigarettes

Alcohol intake: participants were asked about their alcohol consumption. For the purpose of this study, the following three indicators was reported and analyzed:

- Hazardous drinking is defined as consuming 40-59.9g of pure alcohol on average per day for men, and 20-39.9g for women;
- Harmful drinking is defined as consuming ≥ 60 g of pure alcohol on average per day for men, and ≥ 40 g for women;
- Binge drinking is defined as drinking ≥ 5 drinks in a row for men, and ≥ 4 drinks in a row for women (STEPS manual)

Current khat chewing: reported consumption of khat at the time of the survey

Physical Activity: For the purposes of this study, we consider physical activity as any activity done by the muscles in a systematic, structured, and repetitive manner in order to maintain body fitness. In accordance to WHO, MET (Metabolic Equivalent) will used in the analysis of physical activity. MET is defined as the ratio of the work metabolic rate to the resting metabolic rate. One MET is defined as 1 kcal/kg/hour and is equivalent to the energy cost of sitting quietly, around 3.5 ml/kg/min..

A person not meeting any of the following criteria is considered being physically inactive:

- Three or more days of vigorous-intensity activity of at least 20 minutes per day; OR
- Five or more days of moderate-intensity activity or walking of at least 30 minutes per day; OR
- Five or more days of any combination of walking, moderate- or vigorous intensity activities achieving a minimum of at least 600 MET-minutes per week (WHO STEPS manual)

Car Accidents: Respondents' attitudes towards the application of safety measures, such as using a seat belt and helmet, will be assessed.

Mental distress: The assessment tool has a 20 item SRQ. Those experiencing 7 or more symptoms were classified as having symptoms mental distress.

Data Management and Analysis

Data were double entered into EPI INFO (Version 3.5.1), a public access software made available from the U.S. Centers for Disease Control and Prevention. Entered data were exported to SPSS (Version 17.0) for statistical analysis. Frequency distributions of socio-demographical, lifestyle, clinical, and behavioral characteristics of participants were first explored by cross-tabulations across gender and were expressed in percentage (%). Continuous variables were expressed as mean \pm standard deviation values. Chi-Square tests were used to evaluate the differences in the distribution of categorical variables for study groups. Student's t tests were used to evaluate differences in mean values for study groups.

Ethical Consideration

All study participants provided informed consent and all research protocols were approved by the Institutional Review Boards of Addis Continental Institute of Public Health, Addis Ababa, Ethiopia and the Human Subjects Division at the University of Washington, USA. Additionally, the Commercial Bank of Ethiopia Addis Ababa and Addis Ababa Education Bureau was requested officially to give permission to conduct the study. Confidentiality and anonymity was assured by assigning codes to each study participants and that code was kept confidential and was kept in a locked cabinet. The participants were told about their right to withdraw from the study period at any time. Those with risk behavior and probable /confirmed disease condition were informed about their ailment and referred to appropriate center where care is provided.

Results

General characteristics of the population

A total of 51 schools and CBE's branch offices were included in the study. Overall 2205 subjects (1316 men and 889 women) responded to the interview in the study. Among those 1983(89.5%) provided blood sample for biochemical tests. As shown in table 2 the majority of participants were teachers (70.4%). Nearly half of participants were single by marital status (50.5%) more likely to be Orthodox Christians by religion (77.9%), and tend to be younger than 35 years of age (62.8%). Mean age of the study population was 35.6 year (SD=11.8 yrs).

Alcohol, tobacco and khat use

Hundred ninety one (8.7%) reported chewing khat during the study period. Ever use of khat was reported by 410(20.4%) study subject. Current cigarette smoking was reported by 4.5% of the study subject while 8.8% of them reported to be previous smokers. The majority (77.3%) reported alcohol consumption in their life time and nearly 20% of them reported daily or almost daily use of alcohol during the study period (Please see table 2 above)

Fruits and vegetable use behaviors

Approximately one-third of the participants reported no fruit consumption in their usual week diet. The majority of participants reported consuming vegetables at least once per week. (Table 2)

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Table2. Socio-demographic and lifestyle characteristics of study participants Dec 2009-January 2010

<i>Characteristics</i>	<i>Frequency</i>	<i>Percent</i>
Work site		
Bank	650	29.6
School	1,545	70.4
Sex		
Male	1,316	59.7
Female	889	40.3
Age (years)		
≤24	452	30.5
25-34	778	32.3
35-44	365	16.5
45-54	420	19.0
≥55	192	8.7
Religion		
Orthodox	1,717	77.9
Muslim	99	4.5
Protestant	328	14.9
Catholic	17	0.8
Others	42	1.9
Marital status		
Single	1,111	50.3
Married	946	42.9
Other	150	6.8
Alcohol consumption in past year		
Less than once a month	1837	83.2
1-4 days a week	317	14.4
5-6 days a week	31	1.4
Daily	22	1.0
Smoking Status		
Never smoker	1913	86.7
Pervious smoker	195	8.8
Current smoker	99	4.5
Currently chewing khat		
No	2012	91.3
Yes	191	8.7
Eat fruit once per week		
No	727	35.4
Yes	1328	65.6
Eat vegetable once per week		
No	187	9.1
Yes	1857	90.9
Self reported health status		
Poor/Fair	883	40.0
Excellent	1324	60.0

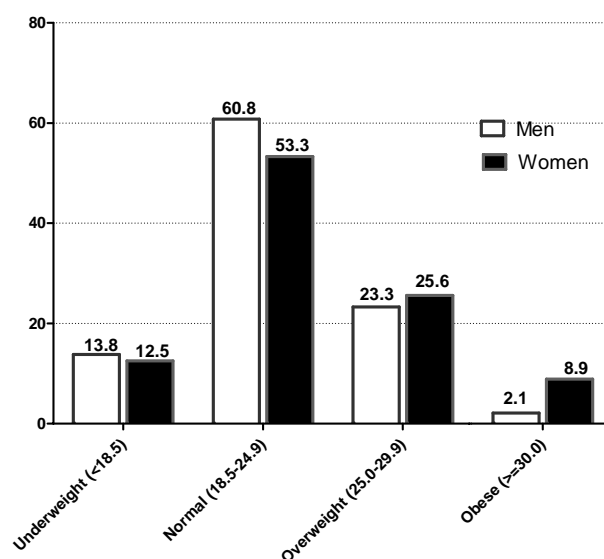


Figure 1—Body Mass Index of study subjects by gender

Nutritional status and level of physical activity

One thousand one hundred twenty three (51.9%) of the study subjects had normal body mass index. More than 30% of the study participants were either overweight or obese. Women were more likely to be obese or overweight compared with men (Figure 1).

About 7.86% of the study participants claimed that they are engaged in vigorous activity at work. More than 21 % of the population reported to be involved vigorous leisure time activities. Those who reported a vigorous leisure time activity had lower prevalence of overweight /obesity (25.1%vs 31.6 %) than the other group. (Table 3)

The biochemical and anthropometric values of study subjects are presented in Table 4 below. Overall Men were more likely to have higher waist circumference, diastolic and systolic BP, Fasting blood glucose and triglycerides; whereas women were more likely to have higher HLD and LDL cholesterol values.

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Table 3.-Levels of physical activity by study participants, December 2010- January 2010

Characteristics	Gender		All
	Male N (%)	Female N (%)	
Occupational vigorous physical activity			
No	1,131 (91.2)	762 (93.2)	1,893 (91.9)
Yes	108 (8.7)	56 (6.8)	164 (8.0)
Occupational moderate physical activity			
No	849 (68.5)	555 (67.8)	1,404 (68.2)
Yes	391 (31.5)	263 (32.2)	654 (31.7)
Cycling or walking for 10 minutes			
No	36 (2.9)	61 (7.5)	97 (4.7)
Yes	1,202 (96.9)	757 (92.5)	1,959 (95.1)
Leisure time vigorous physical activity			
No	870 (70.2)	753 (92.1)	1,623 (78.8)
Yes	369 (29.8)	65 (7.9)	434 (21.1)
Leisure time moderate physical activity			
No	940 (75.8)	714 (87.3)	1,654 (80.3)
Yes	300 (24.2)	104 (12.7)	404 (19.6)

Table4-Cardiometabolic Characteristics of study population according to gender

Characteristic	Gender		P-value
	Men N=1,125 %	Women N=728 %	
	Mean(SD)	Mean(SD)	
Waist Circumference	85.2(11.9)	80.3(13.2)	<0.001
Diastolic blood pressure (mmHg)	79.3(14.6)	75.9(10.1)	<0.001
Systolic blood pressure (mmHg)	123.6(15.3)	115.4(16.1)	<0.001
Mean Arterial Pressure	94.3(13.2)	89.1(11.3)	<0.001
Fasting glucose (mg/dL)	92.5(24.5)	91.6(22.7)	0.423
HDL cholesterol (mg/dL)	45.4(8.5)	50.5(10.5)	<0.001
LDL cholesterol (mg/dL)	114.9(44.9)	119.5(34.8)	0.021
	Median (IQ)	Median (IQ)	
Triglycerides (mg/dL) [†]	111(81-166)	93(71-124)	<0.001

Blood pressure outcomes and health service use

Three hundred eighty five (19.5%) of the study participants had hypertension. Five hundred ninety (27.8%) of the participants had never been measured their blood pressure. Among those with hypertension 15% have never checked their BP and 52% of them were never told about high BP (Table 5).

Table 5 . Relationship of blood pressure measurement with participants' history of health services utilization

	Hypertension	
	NO	YES
Ever checked BP		
No	487 (30.0)	58 (14.8)
Yes	1,132 (69.8)	334 (85.2)
Ever told about HIGH BP		
No	1,458 (89.9)	204 (52.0)
Yes	125 (7.7)	181 (46.2)
Checked /no result	32 (2.0)	6 (1.5)

As shown in figure 2 above men were more likely to be hypertensive than women. Approximately 43% of hypertensives were older than 45 years old while 6.4% of them were between 18 and 24 years of age. Finally, hypertensives were more likely to report smoking and chewing chat.

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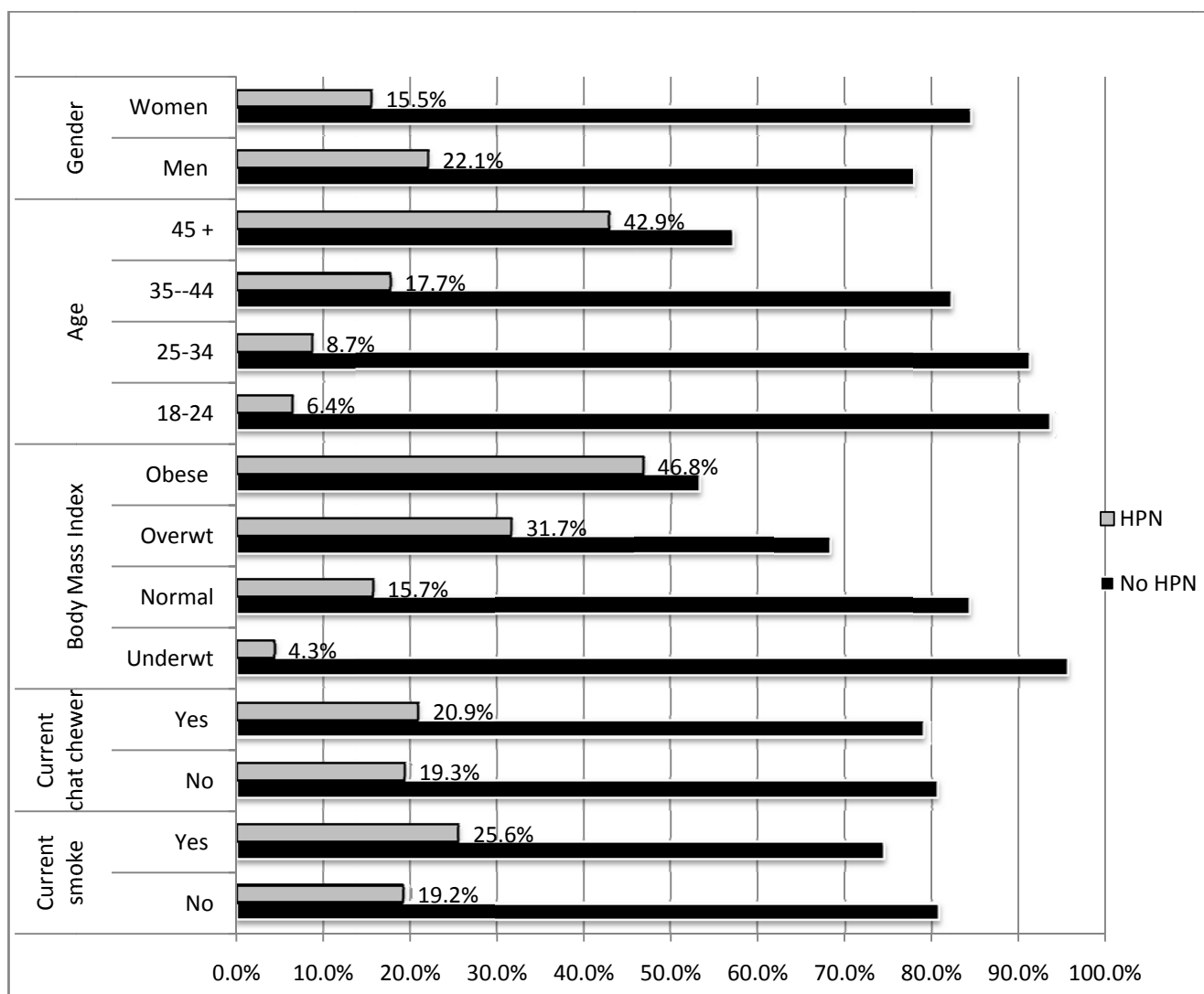


Figure 2.hypertension by sociodemographic, behavioral and nutritional factors *among* study participants in Addis Ababa. December 2009- January 2010

Diabetes and other cardio-metabolic outcomes

As indicated in Figure 3, the overall prevalence of diabetes was found to be 4.55% based on fasting blood glucose measures. Men (5.0%) had higher rate compared to women (4.0%). Women were more likely to have elevated total cholesterol, elevated LDL-C and reduced HDL-C. Men were more likely to have elevated TG. Our preliminary analyses also indicated that the prevalence of pre-diabetes to be higher among study subjects (around 22%). Overall the prevalence of MetS was 17.9%. Women were more likely to have MetS compared with men (14.0% of men and 24.0% of women) (Figure 3).

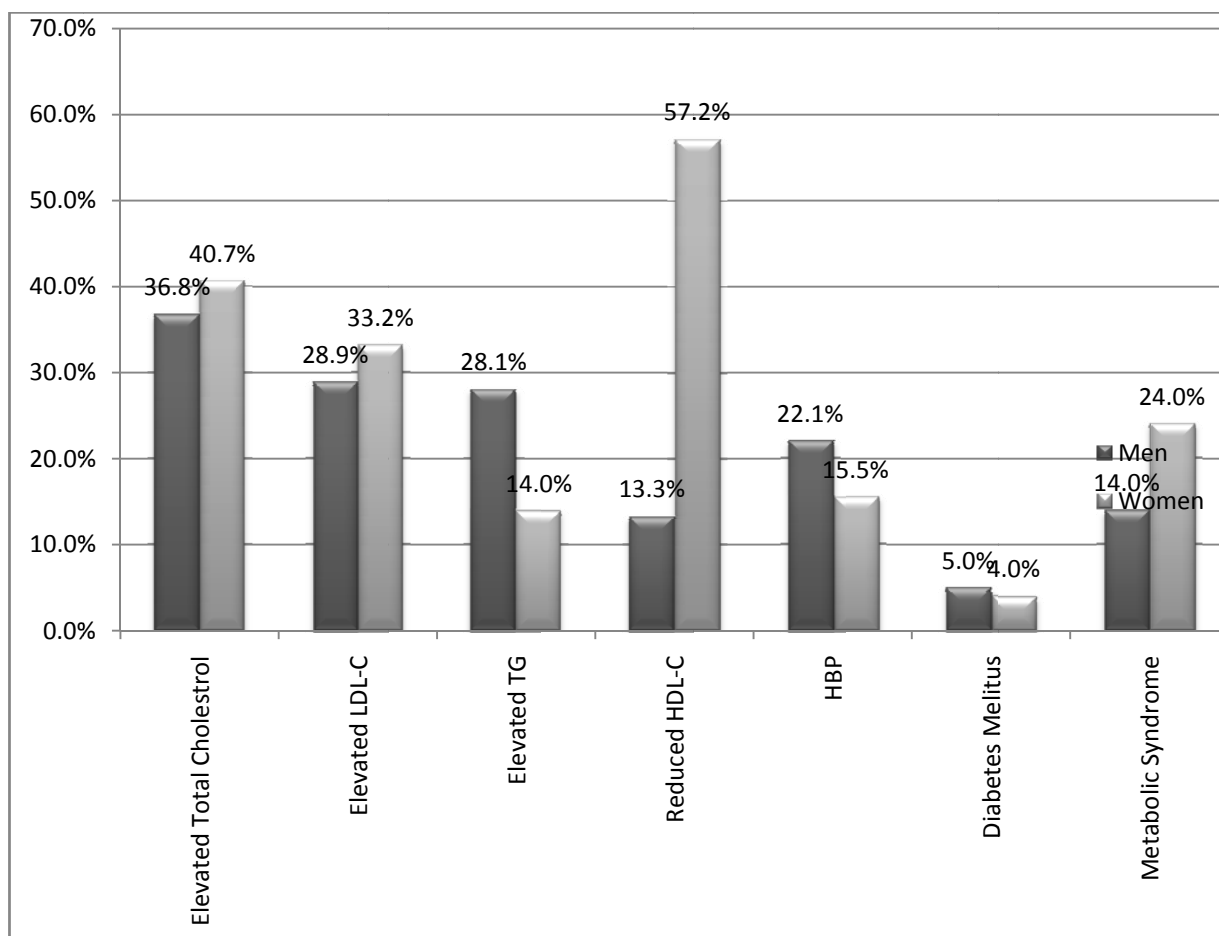


Figure 3. Magnitude of Cardiovascular risk factors by sex, among study participants December 2009- January 2010

Mental distress

The overall prevalence of mental distress was 314(14.1%). Women had higher prevalence of mental distress than men (21.6% vs. 9.5%). Younger participants (age <=24 years) had the highest prevalence of mental distress in both sex. (28.6% women and 13.1% men) (Table 6).

Table 6. Mental distress by selected sociodemographic characteristics among study participants, December 2009 – January 2010

SEX	Category variables		Mental Distress	
			No N (%)	Yes N(%)
Men	Age group	<=24	213 (86.9)	32 (13.1)
		25-34	424 (88.0)	58 (12.0)
		35-44	196 (94.7)	11 (5.3)
		45 above	329 (94.0)	21 (6.0)
Women	Age group	<=24	142 (71.4)	57 (28.6)
		25-34	220 (78.0)	62 (22.0)
		35-44	127 (84.7)	23 (15.3)
		45 above	199 (80.9)	47 (19.1)
Men	Marital status	Single	651 (87.9)	90 (12.1)
		Married	466 (94.9)	25 (5.1)
		Separated	27 (84.4)	5 (15.6)
		Widowed	15 (93.8)	1 (6.3)
Women	Marital status	Single	257 (73.6)	92 (26.4)
		Married	384 (82.8)	80 (17.2)
		Separated/	36 (78.3)	10 (21.7)
		Widowed	29 (80.6)	7 (19.4)

Conclusion

Overall the preliminary study results indicate that the magnitude of cardiovascular risk factors was high among study participants.

Behavioral and lifestyle risk factors

Chat chewing and smoking were mostly used by men. Significant proportion of the population was using these substances. Only a fifth of the study participants were involved in leisure time vigorous physical activities. The majority of participants were not used to have vegetables and fruits in their regular diets.

Cardio-metabolic risk factors and outcomes

The prevalence of overweight and obesity was high among the study participants. Approximately 20% of participants were found to be hypertensive. The preliminary findings also indicate that the magnitude hypertension tends to increase with age. Compared with women men had higher prevalence of hypertension. The prevalence of diabetes mellitus was also high (4.5%). The estimated prevalence tends to increase with increasing age and BMI. The study finding also indicated that the prevalence of dyslipidemia to be high. Notably, the magnitude of risk factors tends to increase by age.

Mental distress

Study results showed that symptoms of mental distress were more prevalent among women and younger age group. Exploring and mitigating the causes of mental distress at the work place would contribute to the well being of workers, success of the institutions and the country at large.

The way forward

This study is the first of its kind in Ethiopia since it included the biochemical tests. The findings will be relevant for policy makers and public health officials to come up with effective and efficient public health intervention. Overall our preliminary study findings call for behavioral interventions targeted on individuals to improve use of appropriate diet, engage in physical activity, and encourage cessation of substance use. Institutional support is also required to reinforce positive behaviors by their employees.

The finding of this study is of significance to policy makers and public health official in Ethiopia. Current and future efforts to strengthen health systems and health care delivery should include attention to evidence-based prevention, diagnosis, and management of NCD. This should include developing and evaluating approaches to build local workforce capacity and implement services for NCD that are integrated with primary health care services. Notably, this study can serve as benchmark to monitor the trend of non communicable disease among the working force.

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