

EFFECTS OF PRENATAL FAMINE EXPOSURE ON ADULTHOOD METABOLIC SYNDROME AMONG SURVIVORS OF 1975-77 E.C GREAT ETHIOPIAN FAMINE IN NORTH WOLLO ZONE, NORTHEAST ETHIOPIA: A HISTORICAL COHORT STUDY



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Abstract

Background. The mortality impacts of 1975-77 E.C Great Ethiopian famine is well documented and was clearly significant. However, the long term sequel of the assault such as its impact on priming for adulthood chronic illness among adult has never been documented. Metabolic syndrome (MetS) has been hypothesized to have an association with grave intrauterine and early childhood nutritional problems. In response, the present study is designed to explore the effects of prenatal starvation on adulthood metabolic syndrome of the survivors of the great Ethiopian famine.

Objectives: To explore effects of prenatal famine exposure on adulthood metabolic syndrome among survivors of the 1975-77 E.C Great Ethiopian famine in North Wollo, Ethiopia, 2019.

Methods: A historical cohort study was conducted from March to April/2019 among 456 adult subjects selected using multi stage sampling methods. Data on socio-demographic and economic, behavioral, dietary consumption, anthropometry and biochemical measurements were collected through face to face interview using a structured questionnaire. Data were checked, cleaned and entered in to Epidata software version 3.1, and were exported to SPSS version 23 software for analysis. The *independent T* test and chi-square were used to assess the differences between two groups. A multivariable Logistic regression was used to control the possible confounders while estimating the effect of the exposure on metabolic syndrome. Odds ratio and their 95% confidence intervals were computed and a P-value of less than 0.05 was taken to declare the level of significance.

Result: Prevalence of MetS among adults who had history prenatal famine exposure was 18.5%, while the proportion among non-exposed adults was 8.4%. After adjusting with sex, residence, dietary consumption, physical activity, alcohol consumption, wealth tertiles. Prenatal famine exposed adults were twice more likely to have MetS compared with the non-exposed groups (AOR=2.25; 95% CI: 1.28, 4.21; P=0.002). There were also higher odds of MetS among adults having low physical activity as compared to high physical activity level (AOR=1.73; 95% CI: 1.07,4.21). Similarly, significant differences were observed in waist circumference, systolic and diastolic blood pressure measurements. But test for association for the high density lipoprotein had shown non-significant relationship (p=0.33)

Conclusion: Prenatal famine exposure is found to have significant association with increased risk of metabolic syndrome. Low physical activity of adults was further strengthening the association of famine exposure for metabolic syndrome. Nutrition during fetal life remains critical in modifying the risk for adulthood chronic disease.

Key words: famine, metabolic syndrome, fetal, Ethiopia

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List of Acronyms / Abbreviations

ATP	Adult Treatment Panel
AOR	Adjusted Odds Ratio
BMI	Body Mass Index
BP	Blood Pressure
CHD	Coronary Heart Disease
CI	Confidence Interval
COR	Crude Odds Ratio
CVD	Cardiovascular Diseases
DBP	Diastolic Blood Pressure
FOAD	Fetal origin of Adult Diseases
FPG	Fasting Plasma Glucose
HDL-C	High density lipoprotein cholesterol
HgA1c	Glycosylated hemoglobin
IDF	International Diabetic Federation
LDL-C	Low density lipoprotein
MetS	Metabolic Syndrome
NCDs	Non communicable diseases
SBP	Systolic Blood Pressure
SRQ	Self- Reported Questionnaire
T2DM	Type 2 Diabetes Mellitus
TC	Total cholesterol
TG-C	Triglyceride cholesterol
WHO	World Health Organization

1. Introduction

1.1 Background

Metabolic syndrome (MetS) is currently an emerging public health problem in low and middle income countries (1).

MetS resulting from the interaction of genetic, hormonal, and lifestyle factors. Over the past two decades, the number of people diagnosed with the syndrome has steadily increased in tandem with the global epidemics of obesity and diabetes. (2). MetS comprises a group of disorders, including abdominal obesity, hypertension, dyslipidemia and hyperglycemia(2).

According to International Diabetes Foundation, MetS is defined as the presence of central obesity plus any two of the following markers: high triglycerides (≥ 150 mg/dl), low high density lipoprotein (HDL) cholesterol < 40 mg/dl in men and < 50 mg/dl in women, hypertension (blood pressure $\geq 130/85$ mmHg or use of antihypertensive medication), high fasting blood glucose (≥ 100 mg/dl or use of treatment for diabetes mellitus (3).

MetS increases risk for a 2.5-fold increased cardiovascular mortality and a 5-fold higher risk of developing diabetes as well as cost related to health care(4).

Different famine study showed that the risks of non-communicable disease begin in fetal life and continue into later age(5,6). Nutritional insult during critical period of fetal life may alter the structural and physiologic functional development of vital organs as well as lifelong effect on later body constitution moreover the tendency to become obese (7). These effects are termed 'programming' and represent an important risk factor for non-communicable disease(NCDs) in adulthood life. Adult chronic disease, therefore, supposed to reflect cumulative differential lifetime exposures to damaging physical and social environments(8) .

Developing countries with populations that are chronically undernourished in early life are undergoing a nutrition transition and are experiencing an epidemic of metabolic disease. These dual burdens are thought to be causally related(9,10).

Ethiopia has a long and troubled history of famines including prolonged droughts and frequent severe rainfall failure, for which no body had studied its chronic effect thus far. Notably, a widespread famine affected the country from 1975-77 E.C. Its epicenter is Tigray and Wollo (11–14) .

The Great famine of Ethiopia from 1975-77 E.C is a catastrophe in human history and caused 1.2 million people death, 800,000 internally displaced, 400,000 refugees left the country, and almost

200,000 children were orphaned, making it one of the worst famines in recent history(11–14) .Yet, can be considered an outstanding model. The mortality impacts are clearly significant but what of the survivors and the generation to come?

Because of ethical and practical concerns, common scientific approaches, such as exposing pregnant women and/or infants, adolescents to famine to investigate later effect in humans is impossible. Famine model studies can give direct evidence where early malnutrition plays a role in development of hypertension, insulin resistance, central obesity, dyslipidemia (15,16).

1.2 Statement of the problem

The Great Ethiopian Famine was a historical disaster which occurred between 1975-1977 E.C (11–14). Such kind of famine studies are a natural experiment (17,18) that give a direct evidence for the hypotheses that early malnutrition plays a role in the origins of hypertension(19,20) ,central obesity (17),dyslipidemia(21,22) and impaired glucose tolerance(23–25) which are all components of MetS.

Non-Communicable Diseases (NCDs) are the leading cause of morbidity and mortality in many countries and has reached epidemic proportions globally. The 2017 WHO progress monitor showed that, NCDs kill 41 million people each year, over 85% of these premature deaths occur in low- and middle-income countries. In Ethiopia, from the total death occurred ,39% were from non-communicable diseases (26).

National survey study in Ethiopia revealed that the prevalence of hypertension, diabetes mellitus and overweight or obese were 15.6%, 6% and 6.3 % respectively(27). The prevalence of MetS in Addis Ababa (17.9%) (28) and Gondar (40.7%) (29).

The risks of adverse long-term consequences of famine exposure during critical period of growth and development is further exacerbated by increased industrialization, urbanization, sedentary life styles(30) .A positive energy balance during adulthood and a nutritionally rich environment in later life (21,31,32) . A good example of famine exposure is the group of Jewish migrants to Israel from Ethiopia, known as the Falashas. This group was moved from a country regularly blighted by famine to an essentially westernized nation. Within 5 years of the migration, rates of non-insulin dependent diabetes among the Falashas had risen to nearly 18%, which was 30 times greater than

the prevalence among Ethiopians living in Ethiopia and two fold greater than in the rest of the Israeli population (33).

In the view of the above, Ethiopia has double risk factors for the occurrence of non-communicable disease in which it has famine exposure history and recent increased urbanization. As of the growing burden of metabolic disorders, the comprehensive prevention and control strategies of preventing chronic diseases and their risk factors focusing on reduction of risky behaviors referred to as modifiable risk factors (physical inactivity, inadequate intake of fruits and vegetables, alcohol consumption and cigarette smoking(34) .Yet, those are the conventional approach to curb chronic diseases prevention.

An improvement in fetal, infant, and child growth which is a life course approach has the potential to reduce the incidence of metabolic disorders (10,35). Since the phenotypic effects of epigenetic modifications are long-term and potentially reversible, once the mechanistic basis of the disease is understood, intervention and strategies aimed at reversal can be devised and implemented (36) . Hence this study is aimed to assess effects of prenatal famine exposure on adulthood metabolic syndrome among survivors of the Great Ethiopian famine in North Wollo, Northeast Ethiopia, March 2019

2. Literature Review

Fetal development is life stages that are characterized by rapid growth, development and maturation of organs and systems. Variation in the quality or quantity of nutrients consumed by mothers during pregnancy can exert permanent and powerful effects upon developing tissues. These effects are termed 'programming' and represent an important risk factor for non - communicable diseases of adulthood, including the metabolic syndrome (19).

The later development of disease triggered by the environment before and after birth is possibly explained through three kinds of process. First, they have fewer cells in key organs, such as lower nephron number in the kidney, low beta cells in the pancreases and lower cardio-myocytes in heart (37). Another process by which slow fetal growth may be linked to later disease is in the setting of hormones and metabolism.

A third link between starvation during critical period of growth and development and later disease is that people who were small at birth are more vulnerable to adverse environmental influences in later life (38).

Past and ongoing under nutrition among pregnant women may contribute to the development of metabolic syndrome as suggested by epidemiological studies from high income countries linking under nutrition in fetal life with increased burden of non-communicable diseases in later life(39). Exposure to suboptimum nutrition during crucial periods of development especially the fetal period increases the risk of MetS and non-communicable diseases in later life (40,41). The effect of maternal under nutrition during gestation on later health depends on its time during gestation. Particularly, early prenatal period is vulnerable (25) .

Cross- sectional study conducted in china showed that by using ATP III criteria the prevalence of metabolic syndrome among adults in non-fetal (5.7%) and fetal exposed (7.7%) cohorts. The prevalence of the metabolic syndrome among fetal exposed with Western diet were (34.6%) and fetal famine-exposed cohort with a traditional diet in later life was only 4.2% (42).

Historical Cohort study done in Dutch showed that prenatal exposure to famine or reduced birth weight is not associated (OR: 1.2; 95% CI:0.9, 1.7) with a significantly greater prevalence of the metabolic syndrome.(38) .The mean prevalence MetS was 32% according to the widely applied national cholesterol education program definition and 49% according to IDF definition (38).

Historical cohort study done in china showed that the prevalence of MetS in the non-exposed and fetal exposed group men were 16.4% and 20.1% respectively and in women non-exposed (13.5%)

and fetal exposed (23.7%) by using IDF criteria. Famine exposure during the fetal period (OR 1.47;95% CI:1.05,2.07) had 47% higher risk of MetS as compared to non-exposed group (43). Another cross-sectional study done in china on retired workers showed that the prevalence of MetS by using IDF criteria were 25.2 % (non-exposed) and 26.9 % (fetal exposed group) and there is no significant association between fetal famine exposure and MetS (AOR=0.96, 95% CI: 0.77-1.20) (44).

Cross-sectional study conducted in urban residence of china population showed that prevalence of metabolic syndrome in Women with fetal exposed group (7.3%) and non-exposed group(4%) .The odds of MetS is 1.89 times (AOR=1.87:95%CI: 1.15–3.04) higher in fetal exposed group as compared to non-exposed cohort (45). This study also showed that the prevalence of metabolic syndrome among men in control and fatally exposed groups were 20.1% and 22.5% respectively, but there was no significant difference of prevalence among the two groups (45).

Meta-analysis showed that fetal exposure group had 11% increase with risk of MetS Compared with the unexposed group.(46).

Cross-sectional study conducted on Holocaust famine survivors showed that prevalence of MetS among a non- exposed and exposed group were 9 % and 17% respectively. Fetal exposed group were 2 times (AOR = 2.14, 95% CI):1.48–3.47) more likely to have MetS as compared to non-exposed group (47) .

Retrospective cohort study done in China in 2010 reported that SBP/DBP was about 0.7/ 0.7 mmHg higher in subjects exposed to famine during fetal development as compared to the non-exposed cohort (20).

Historical Cohort Study in china showed that fetal exposed group had a significantly higher SBP (2.2 mmHg) and DBP (0.9mmHg) difference as compared to non-exposed group (48).

Study conducted in Western Holland among Dutch famine survivors reported that famine exposure of at least 10 weeks duration was associated with elevated systolic (2.77 mmHg and diastolic (1.27 mmHg) blood pressure as compared to non-exposed (49).

Historical Cohort Study conducted in Nigeria showed that Fetal-infant exposure to famine was associated with elevated systolic (+7 mmHg) and diastolic (+5 mmHg) blood pressure.(39) .

Cross-sectional study conducted in Israel (Holocaust famine) showed that diabetes among exposed group were 15. % greater than non-exposed group (50) .

Cross-Sectional Survey conducted in Northeastern China showed that increased risk of diabetes in the fetal exposure cohort was 2.7% higher than non-exposed group (51).

Another study conducted in china in 2010 showed that prevalence of hyperglycemia among adults in non-exposed and fetal exposed were 2.4%, 5.7% respectively (23).

Individuals who had been exposed to famine during the fetal period and who had lived in a severely affected area had 0.31% higher glycosylated hemoglobin (HbA1c) as compared with unexposed individuals (52).

Other cohort study conducted in china in 2016 reported that the prevalence of diabetes in the exposed group was 12.8% higher as compared with unexposed individuals (53).

2.1 conceptual frame work

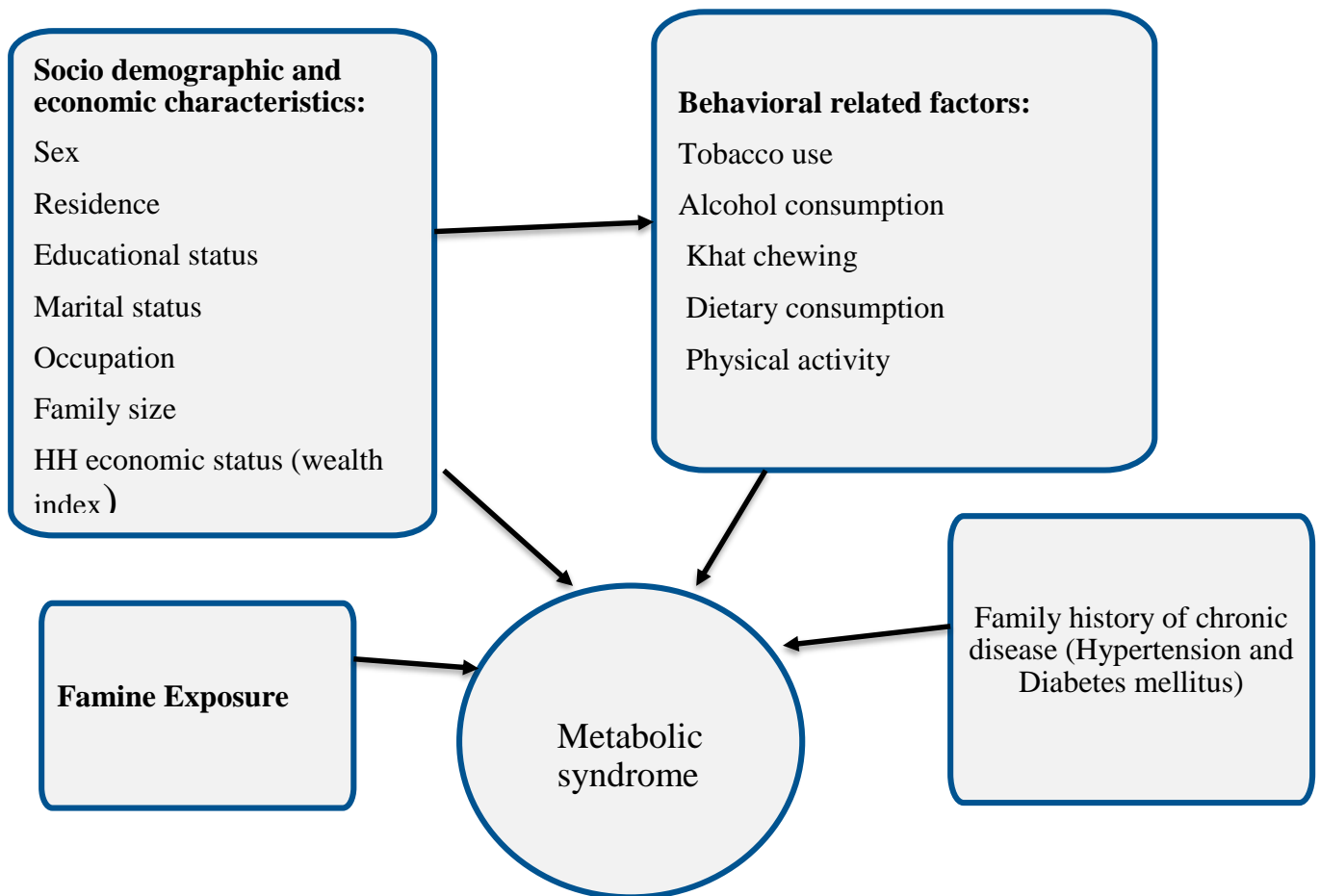


Figure 1: Conceptual frame work for effects of prenatal famine exposure on adulthood metabolic syndrome, based on Agent-Based Model (Jeff, 2010)

2.2. Significance of the study

Because of ethical and practical reasons, such as exposing pregnant women and/or infants, adolescents to famine to investigate later effect in humans is impossible. Now it is a previous chance for us to study the long-term effects of malnutrition in the womb. As a result, the study will provide a clue of what is behind on alarmingly increasing non-communicable chronic diseases in our country, Ethiopia. Understanding the role of early life nutrition is essential for the implementation of initiatives aimed at curbing the current metabolic disorders which is particularly relevant to Ethiopian.

The study will enhance our knowledge of fetal origin of adult's disease. The study is also help to establish the first African cohort of starvation study.

Besides providing evidence on the impact of famine on chronic non-communicable disease, the study will contribute to the broader empirical literature on the importance of maternal and early childhood nutrition. The potential of the finding is great with respect to several implications for policy, health service and self-care practice, preventing the disease that occur later in life and transgenerational effect of famine. The study will provide peculiar evidence to formulate setting specific prevention strategies for non-communicable diseases.

3. Objectives

3.1 General objective

To assess the effects of prenatal famine exposure on metabolic syndrome among survivor's adulthood of the Great Ethiopian famine in North Wollo, Northeast Ethiopia, March 2019

3.2 specific objectives

- ✓ To examine the effects of prenatal famine exposure on risk of metabolic syndrome among survivor's adulthood.
- ✓ To identify factors associated with the risk of metabolic syndrome among survivor's adulthood.

4. Methods and Materials

4.1 Study Area and Period

The study was conducted in North Wollo Zone, Ray kobo town and Rural Woreda, located in the northeastern part of Amhara regional state from March 15 to April 30, 2019. The two Woreda are located at 49.7km from Woldya capital city of north wollo zone and 408 km from Bahirdar the capital city of Amhara regional state.

The land in the area is mostly mountainous and not really suitable for cultivation. There are five agro-ecological zones namely, Kolla (low land and warm), Woinga-dega (moderate), Dega (cool), Kur Wurch (cold) and Berha desert with high temperatures. The two Woreda has 38 kebeles of which 4 were urban and the other 34 were rural. Currently about 289, 877 populations are living in the Woreda, out of which 147,837 are females (North Wollo population, EFY,2011) This area had troubled history of famines occurred between 1975-1977 E.C where its epicenter is Tigray and Wollo. ‘‘Waja’’ a small town between kobo and Alamata was place where famine first began. The 1975-1977 E.C crisis is referred to by some as the " time men ate grass": many peasants had eaten wild plants to save themselves from a slow, agonizing death. It was the worst disaster in living memory, in human history and caused over half a million deaths, making it one of the worst famines in recent history, yet can be considered an outstanding model (11,14).

Severe rainfall failure, military offense, aerial bombardment of markets, destruction of cattle and grain stores, burning of crops, and tight controls on movements of migrants combined to prevent the normal redistribution of grain and livestock surpluses in northern Ethiopia (13,14).

4.2 Study Design

A historical cohort study design was employed.

4.2.1 Famine cohorts and exposure age categories

Subjects were categorized into two exposure cohorts according to the subject’s birthday and corresponding exposure period (54). The prenatal famine exposure periods were taken, using 1 April ,1975. E.C., the start of the famine, as reference to assess age at famine exposure, Subjects who were born between April 1,1975 to August 30, 1977.E.C. categorized as exposed group whereas those born between 1 September 1979 and 30 September 1981.E.C. categorized as non-exposed group based famine condition lasted in the area(11). However, to reduce effect of famine on subsequent group of control, a period of one-year transition time (washout time of famine) (39)

considered and hence, adults born between 1 September 1978 to 30 August 1978 were excluded (55). Accordingly, exposed group were adults of current age range from 34 to 36 and non-exposed group was those age range from 30 to 32.

Table 1::Window of exposure to the 1975-77 E,C Great Ethiopian Famine cohort, North Wollo zone, 2019.

Date of birth (dd/mm/yyyy)	Exposure to famine (September 1975-August 1981)	Age in 2011 (years)
01/08/1975-30/12/1977	Prenatally exposed individuals	34-36
01/01/1978-30/12/1978	Transition (Washout period)	33
01/01/1979-30/01/1981	No exposure (reference group)	30-32

4.3 Population

4.3.1 Source population

All adults born during the 1975-77. E.C. Great Ethiopian famine and adult born after the famine (1979-1981 E.C).

4.3.2 Study population

All randomly selected adult born during the 1975-77. E.C. Great Ethiopian famine and adult born after the famine September 1979-1981 E.C.

4.4 Sample Size Determination and Sampling Technique

4.4.1 Sample size determination

The sample size was calculated by using Epi-Info version 7 by considering 5% margin of error 80% power, design effect 1.5, 5% non-response rate and 1:1 ratio ($r=1$). Assuming a prevalence of type 2 diabetes mellitus in fetal exposed to be (22.6%) and non-exposed group (9.8%) (53) Hence the final sample size was 456.

4.4.2 Sampling procedures

4.4.2.1 Selection of famine exposed and non-exposed groups

Multistage stage sampling technique was used to select the study subjects across North wollo Zone. First, Raya kobo Woreda and Raya kobo town was purposely selected then 30% of Raya kobo Woreda (10 kebeles) and Raya kobo town was selected.

Second, baseline survey was conducted on selected kebeles to identify the cohort of adult who were exposed for prenatal famine during the great Ethiopia famine period with the guidance of developmental army and health extension workers. Registration were done for all adults born during the famine season and after famine season and assigned a unique number to each of them in order to prepare sampling frame. Then number of adults were allocated for selected kebeles based on population proportion to size.

Adults were selected from each kebeles by using simple random sampling method from registration. In households with more than one adult was found by using lottery method one of the adult were taken.

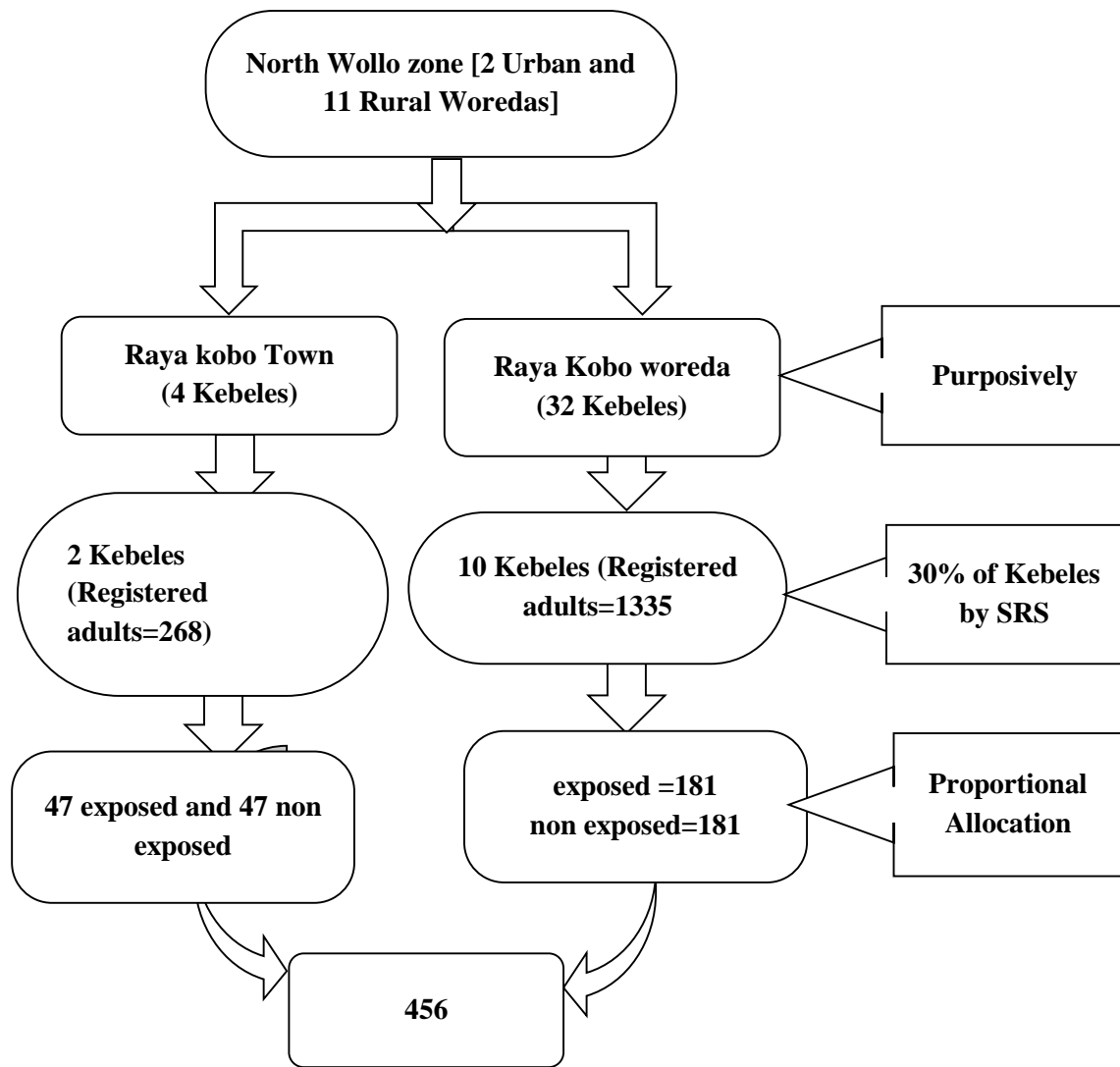


Figure 2: Sampling procedure in the section of eligible subjects for 1975-77.E.C Great Ethiopian Famine, North Wollo zone, Ethiopia

4.5 Study Variables

4.5.1 Dependent variable

Metabolic syndrome

4.5.2 Independent variable

- ✓ Prenatal exposure to famine
- ✓ Socio demographic characteristics: Sex, residence, level of education, marital status, occupation, family size and household economic status (wealth index).
- ✓ Behavioral related factors: Tobacco use, alcohol consumption, Khat chewing, physical activity, history of dietary consumption
- ✓ History of chronic illness (Hypertension, Diabetes mellitus)

4.6 Eligibility Criteria

4.6.1 Inclusion criteria

Adults with current age 34-36 who were born during the 1975-77. E.C. Great Ethiopian famine and adults with current age 30-32 who were born after the famine (1979-1981 E.C).

4.6.2 Exclusion criteria

Adult who have physical disability including deformity (Kyphosis, Scoliosis, limb deformity), pregnant women or lactating mother of less than 3 months and using hormonal contraceptives and seriously ill. Those who displaced to other area of the country and those were in other location during the famine adults were excluded

4.7 Data Collection Tools and Techniques

Data of socio-demographic characteristics, history of famine condition, history of chronic illness and behavioral characteristics of the participants such as dietary history, smoking status, alcohol consumption, khat chewing, physical inactivity were collected using structured questionnaire. Household wealth status was assessed by asking about household assets, utilities and housing characteristics were used finally to generate household wealth index based on EDHS (56).

Assessing famine condition

The famine related questions was asked to obtain some information on exposure status to the famine and determine extent of mortality and morbidity consequences using recommended WHO verbal autopsy tool supplementing specific area and period of exposure to the famine.(57)

Dietary assessment

The dietary consumption over the past 12 months was assessed based on recommended seven food group by FAO, using 38 food items that highly consumed in the area. Participants were asked about the usual frequency of each food consumed during the past 12 months. According to the frequency of food intake, each food item was classified into nine intervals. Before actual data collection, it was validated in the study area (Cronbach alpha,0.8) conducting pretest (58).

Physical activity: Physical activity was assessed based on intensity, duration and frequency of physical activity at work, in recreational settings and involving transportation (journeys), using a set of 16 questions. Data were collected on the number of days, hours and minutes of physical activity performed at work, involving transportation and in recreational settings for at least 10 minutes or more continuously each day. The three levels of physical activity suggested in the WHO recommendations for classifying populations were used as low, moderate, and high level physical activity (27).

History of Hypertension and Diabetes mellitus

Individuals and family history of diabetes and raised blood pressure were assessed by asking whether specific measurements for these purposes previously performed and any confirmed of the case by a doctor or health worker. Study participants were also asked about if any medication was taken for aforementioned purposes.

Anthropometric measurement

The anthropometric data were collected by using the procedure stipulated by the WHO for taking anthropometric measurement. All anthropometric measurements were done in two times and the average value was used for further analyses (59).

Body weight: Weight was measured using portable battery operated Seca digital scale (Seca Germany). The weighing scale was checked for zero reading before the adult was asked to stand on it. In addition, the proper performance of each scale was checked every day by known 3kg sand filled plastic bottle before the fieldwork. A standardization exercise was performed during the training to capture technical error of measurement (TEM). During the procedure the subjects has been worn light clothes and taken off their shoes. The weight was recorded to the nearest 0.1 kg.

Height: Height was measured using portable stadiometer (Seca Germany). All participants have been measured against the wall in upright position, without foot wear and with heels together and their heads positioned and eyes looking straight ahead (Frankfurt plane) so that the line of sight

perpendicular to the body. knees straight, the heels, buttocks and the shoulders blades touching the vertical surface of the stadiometer. The height was recorded to the nearest 0.1cm. The same measurer had employed for a given anthropometric measurement to avoid variability.

Waist circumference: Waist circumferences was measured using figure finder tape measure (SECA, Germany, Model 200) recommended by the WHO. The measurement was taken in the mid-axillary line midway between the last rib (10th rib/lower margin of lowest palpable rib) and the superior iliac crest with the client wearing no or light clothing at the end of a normal expiration/at the end of exhalation. The measurement was taken to the nearest 0.1 cm over the skin.

Blood pressure measurements

Blood pressure (BP) was measured in the left arm with sphygmomanometer. Three seated BP measurements were taken for each subject spaced five minutes apart. To improve the reliability of measurement three readings was taken with 5 min interval and the average of the three readings was recorded as the final BP of the patient. But if the difference between the two readings was greater than 5 mmHg, a third measurement was taken and the average of the three readings was recorded as the final BP of the patient.

Biochemical measurements

Biochemical measures include fasting total cholesterol; plasma glucose; triglycerides, and high-density lipoproteins were measured. The collection of venous blood was carried out the day after collection of behavioral and physical measurements. Blood was taken from the survey participant after overnight fasting (8-12 h) in the morning (07:00–09:00). Five milliliter of venous blood was collected from each patient in plane test tubes and serum was separated immediately. The serum was separated and put into ice bag and safely transported to Dessie regional laboratory. The extracted serum was investigated for High density lipoprotein-cholesterol(HDL-c), triglyceride and fasting glucose using A25 bio-system clinical chemistry analyzer.

Data collectors

In the data collection process, 12 developmental army and 12 health extension workers were deployed over 12 Kebeles to conduct base line cohort survey. Four team composed of eight BSc nurses, four laboratory technologist and four Public Health officers who are fluent in the local language were participated as a data collector and supervisor respectively. The interview and

physical measurements was taken at household level and repeat at nearby facility appointing them for subsequent day of visit since those measurement was expected taken at their fasting state.

4.8 Data Quality Control

The questionnaire was prepared in English and then translated to local language (Amharic). Validation and calibration of the instrument after each measurement and after moving the instrument from one place to another was performed. Data collectors were recruited based on their qualification and prior experience of data collection. An intensive 4 days training were provided for the selected data collectors and field supervisors. A pretest was done on 5% of the sample in Woldya Zuria a one week prior to the actual data collection.

Standardize operated procedures were follow to collect blood samples and to perform laboratory analysis.

4.9 Data Processing and Analysis

The data were cleaned, coded and entered into Epidata version 3.1 and analyzed using SPSS version 23. Data were summarized and presented using descriptive statistics. The comparison of baseline characteristics between famine exposed and non-exposed participants were carried out using the independent t-test for continuous variables with normal distribution and the chi-square test for discrete variables.

Bivariate analysis was used to check each independent variables having association with the dependent variable then those variables found to have p-value of less than 0.25 was entered in to multivariable logistic regression for controlling the possible confounders. Odds ratio with their 95% CI was computed and variables having p - value less than 0.05 in the multivariate logistic regression model was considered as significantly associated with the dependent variable.

Hosmer and Lemeshow test used for assessing of the goodness-of fit of the model with chi-square of 5.9 and p value of 0.55. All tests are two sided, and p values less than 0.05 were considered statistically significant.

4.10 Ethical Consideration

Ethical Approval was obtained from Jimma University Institute of Health, Ethical Review Committee. Permission letters was secured from Amhara regional health bureau and North Wollo Zone Health Department as well as from the two Woreda health offices. The purpose and importance of the study was explained to the participants. Written consent was sought from participants following and explanation of the research study, clarification that participants can be

free to withdraw from the study at any time. The names and address of the participants was not recorded in the questionnaire to assure confidentiality.

After identifying of adult with metabolic syndrome during taking of the laboratory result. All adults with risk of metabolic disease were get counseling and linked to the health facility as well advice given for strengthen further screening habit for chronic illness.

4.12 Dissemination Plan

The results of the study will be presented and submitted to Department of Population and Family Health, Institute of Health of Jimma University, Amhara Regional State Health Office, North Wollo Zone Health Administration and Woreda Health Offices.

Study results will be disseminated to the scientific public by presentation at national and international conferences and by publication in peer-reviewed journals. we aim to also disseminate the study findings among nutritionists, midwives, pediatricians and gynecologists who are in a position to advise pregnant women, lactating mothers and children about nutrition and the public in general by publishing results in national newspapers.

4.13 Operational Definitions

Metabolic syndrome: According to international Diabetes Federation (IDF) metabolic syndrome can be defined as the presence of abdominal obesity (waist circumference (male ≥ 83.7 cm, female ≥ 78 cm) plus any of the four parameters (3)

- Raised TGs >1.7 mmol/L (>150 mg/dl) or treatment for this dyslipidemia (3)
- Reduced HDL-C <1.03 mmol/L (40mg/dl) in men or <1.29 mmol/L (<50 mg/dl) in women, or treatment for dyslipidemia (3)
- Raised BP: systolic BP ≥ 130 or diastolic BP ≥ 85 mmHg, or treatment of hypertension
- Raised FPG ≥ 5.6 mmol/L (≥ 100 mg/dL) or a history of type 2 diabetes (3)

Body mass index (BMI): Body mass index a person's weight in kilograms (kg) divided by his or her height in meters squared.

Waist circumference (WC): Waist circumference is body composition measurement and an important predictor of health outcomes in adult men and women of all age groups cut-off for obesity was 83.7 cm(males) and 78.0 cm (females (60).

Famine exposure: famine exposure was defined as prenatal exposure to famine period of 1975-77. E.C. (time exposure) and born in the area of widespread scarcity of food, caused by several factors

including war, inflation, crop failure, or government policies. This phenomenon is accompanied verbal autopsy regarding food scarcity and increased mortality in the area (61) .

Wealth index: is a composite measure of a household's cumulative living standard. Households were given scores based on the number and kinds goods they own ranking each person in to high, medium and low socio economic status after performing principal component analysis.

Assessing tobacco use: all current smoker and past smoker of more than one cigarette per day while nonsmoker if they found never smoker. (27).

A standard drink is any drink containing about 10g of alcohol. Standard drinks per drinking occasion. A standard drink contains approximately 10g of pure alcohol. One bottle of factory beer or one tin of local alcoholic drink like tella and tejj considering common local measurement were considered as standard drink. standard alcoholic drinks during one occasion was asked among current (past 30 days) drinkers (27).

Consumption of ≥ 60 gm of pure alcohol for men and ≥ 40 gm of pure alcohol for women on an average day in the past 30 days were considered high level use of alcohol (62).

Khat use: all current khat chewer and past chewer of more than one bundle of khat per day/ week while non chewer if they found never chewer (27).

Unhealthy dietary consumption: consumed low fruit and vegetables and high salt and animal source food.

High-level physical activity involves a person reaching any of the following criteria: moderate-intensity activity at least three days per week, achieving at least 1500 MET minutes per week

Moderate level physical activity involves a person not meeting the criteria for the high-level category, but meeting, achieved 600 to 1500 MET-minutes per week.

Low level physical activity involves a person not meeting any of the above-mentioned criteria less than 600 MET-minutes per week (27).

5. Result

5.1 Sociodemographic-economic characteristics of adults

Out of the total 456 adults, initially planned for the study, 447 of them were included in this analysis with response rate of 98%. The mean (SD) age of adults was 33.19(2.09). The study consisted 258 (57.7%) of females while the rest were males. Majority (92.6%) of respondents were orthodox by religion and the remaining of the respondents were Muslim followers. Higher proportion (82.1%) were living in rural area while 18.8% of respondents were living in urban areas. Two third (64.9%) of the respondents were married followed by single marital status. One third (30.6%) of the respondents cannot read and write. More than half (51.7%) respondents had medium wealth tertile while 31.5% were from low socio economic status (Table2). According to table 2 below except marital status, educational status and family size all socio demographic characteristics were not different among the famine exposed and non-exposed groups.

Table 2: Socio demographic characteristics of the study participants by famine exposure Status, in North Wollo zone, Northeast Ethiopia, March to April 2019 (n = 447)

Variables	Total N (%)	Famine Non-exposed	famine Exposed group	P ^a
Sex Female Male	258 (57.7) 189 (42.3)	123 (47.7) 102 (54)	135 (52.3) 87 (46)	0.189
Residence Urban Rural	84 (18.8) 363 (81.2)	42 (50) 183 (50.4)	42 (50) 180 (49.6)	0.946
Religion Orthodox Muslim	414 (92.6) 33 (7.4)	211 (51) 14 (42.4)	203 (49) 19 (57.6)	0.345
Educational status cannot read and write primary school secondary school above secondary school	137 (30.6) 97 (21.7) 113 (25.3) 100 (22.4)	53 (38.7) 42 (43.3) 67 (59.3) 63 (63)	84 (61.3) 55 (56.7) 46 (40.7) 37 (37)	0.02
Marital status Single Married divorced/widowed	92 (20.6) 290 (64.9) 65 (14.5)	59 (64.1) 145 (50) 21 (32.3)	33 (35.9) 145 (50) 44 (67.7)	0.0004
Occupational status Government employee Non- government employee Farmer House wife Merchant Others ¹	99 (22.1) 38 (8.5) 88 (19.7) 122 (27.3) 66 (14.8) 34 (7.6)	55(55.6) 23(60.5) 36(40.9) 56(45.9) 32(48.5) 23(67.6)	44(44.4) 15(39.5) 52(59.1) 66(54.1) 34(51.5) 11(32.4)	0.06
Family size =<4 =>5	322 (72) 125(28)	174 (54) 51(40.8)	148(46) 74(59.2)	0.012
Wealth index Low Medium High	141 (31.5) 231(51.7) 75 (16.8)	67(47.5) 121(52.4) 37(49.3)	74(52.5) 110(47.6) 38(50.7)	0.649

1= students, daily laborer, Drivers

5.3 Behavioral related characteristics of adults

More than half (54.1%) of the respondents were had high physical activity while small portion (10.1%) were had low physical activity practice. One hundred ninety-one (42.7%) were consumed unhealthy diet and the rest were consumed healthy diet. Two third (63.5%) were drink alcohol greater than one standard per one occasion. larger proportion of study participant do not chew khat and use cigarette. There is no difference in behavioral related factors between groups.

Table 3: Behavioral characteristics of the study participants by famine exposure Status, in North Wollo zone, Northeast Ethiopia, March to April 2019 (n = 447)

Variables	Total N (%)	Famine Non-exposed	famine Exposed group	P^a
Physical activity level Low Moderate High	45 (10.1) 160 (35.8) 242 (54.1)	20 (44.4) 86 (53.8) 119 (49.2)	25 (55.6) 74 (46.3) 123 (50.8)	0.472
Dietary consumption Healthy Unhealthy	256 (57.3) 191 (42.7)	120(46.9) 105(55)	136 (53.1) 86 (45)	
Alcohol consumption Low level drinker High level drinker	163 (36.5) 284 (63.5)	83 (50.9) 142 (50)	80 (49.1) 142 (50)	0.851
Khat chewing Yes No	25 (5.6) 422 (94.4)	13 (52) 212 (50.2)	12 (48) 210 (49.8)	0.864
Smoking Yes No	6 (1.3) 441 (98.7)	3(50) 222(50.3)	3 (50) 219 (49.7)	0.65

P^a p- value for chi-square and fisher exact test

5.2 Famine Intensity Assessment of 1975-77 E.C Ethiopian Great Famine

The level of great famine condition that had been 30 years back in area were assessed through verbal autopsy and based on available demographic data. Participants were asked and responded to the issues related to feelings toward state of famine by remembering parents telling about issue, availability of food items to cope with famine and presence of death in households to know severity

of famine in complement with area exposure and time exposure. The result shows 441(98.1%) felt hardly while the rest were felt little worry of famine as explained from by their family, none of participants had sufficient foods or resource during famine period. Nineteen (4.3%) of respondents were reported deaths from family member due to extreme famine

5.4 Differences among metabolic parameters based on famine exposure

There existed significance difference in waist circumference $P=0.025$), triglyceride($p=0.01$), systolic and diastolic blood pressure ($p=0.052$, $p=0.003$), fasting plasma glucose($p=0.001$) and metabolic syndrome ($p= 0.002$) between famine exposed and non-exposed groups. However, there is no significance difference in high density lipoprotein (HDL)($p=0.336$) among famine exposed and non-exposed adults. (Table 4)

Table 4: Association of famine exposure status with metabolic components of adults in North Wollo zone, Northeast Ethiopia, March to April 2019 (n = 447)

Metabolic components	Non-exposed	Exposed	P value	Mean difference 95% CI
Waist circumference, cm	81.33 ± 11.1	83.66 ±10.42	0.025	2.27 (0.28, 4.26)
HDL, mg/dl	45.3 ± 11.8	44.21 ±12.27	0.336	-1.09 (-3.34, 1.14)
Triglycerides, mg/dl	76.69 (60.99)	87.65 (78.24)	0.010	10.96**
Systolic BP, mmHg	112.2 ± 11.9	114.60±12.91	0.052	2.23 (-0.02,4.46)
Diastolic BP, mmHg	74.5 ± 9.4	76.9±9	0.003	2.47 (0.84, 4.11)
Raised FPG n (%) (yes)	26 (11.6)	52 (23.4)	0.001	11.8*
MetS n (%) (yes)	19 (8.4)	41 (18.5)	0.002	10.1*

Data presented are mean ± SD for continuous variables, and n (%) for frequency variables.

P values in independent T test for differences in means or Chi-square tests for differences in proportions between non-exposed and exposed group

** median (interquartile range) the data were not normally distributed and p-value from logarithmic transformation * proportion

5.4 Factors associated with metabolic syndrome

Bivariate and multivariable logistic regression analysis was done using enter method to analyze factors associated with metabolic syndrome On the Bivariate analysis variable like famine exposure, sex, residence, wealth tertiles, physical activity, dietary consumption, alcohol consumption became a candidate for multivariate analysis.

Adults having prenatal famine exposure were 2.25 times more likely to have metabolic syndrome as compared to non-exposed group (AOR=2.25; 95% CI: 1.28, 4.21). The odds of metabolic syndrome were nearly two times among adults with low physical activity level as compared to high level physical activity (AOR=1.73; 95% CI: 1.07,4.21).

Table 5: :Multi variable logistic regression analysis of metabolic syndrome among adults in NorthWollozone,NortheastEthiopia,2019(n=447)

Variables	Metabolic syndrome		COR(95%CI)	AOR(95%CI)
	Yes n (%)	No n (%)		
Famine exposure status				
Exposed	41(18.5)	181(81.5)	2.46 (1.37, 4.38)	2.25(1.28, 4.21) *
Non-exposed	19(8.4)	206(91.6)	1	1
Sex				
Female	34(13.2)	224(86.8)	1.05 (0.88, 1.87)	1.02 (0.55,1.65)
Male	26 (13.8)	163(86.2)	1	1
Residence				
Urban	13(15.5)	71(84.5)	1.23 (0.63, 2.39)	1.22 (0.61,2.23)
Rural	47(12.9)	316(87.1)	1	1
Wealth tertiles				
Low	19(13.5)	122(86.5)	1	1
Medium	30(13)	201(87)	0.96 (0.52, 1.77)	0.85 (0.45,1.67)
High	11(14.7)	64(85.3)	1.11 (0.49, 2.46)	1.09 (0.48,2.49)
Physical activity level				
Low	8(17.8)	37(82.2)	1.79 (1.16, 4.26)	1.73 (1.07,4.21) *
Moderate	26(16.3)	134(83.8)	1.61 (0.89,2.89)	1.56 (0.84,2.77)
High	26(10.7)	216(89.3)	1	1
Dietary consumption				
Unhealthy diet	26(13.6)	165(86.4)	1.03 (0.59,1.78)	1.01 (0.54,1.71)
Healthy diet	34(13.3)	222(86.7)	1	1
Alcohol consumption				
Low level drinker	21(12.9)	142(87.1)	1	1
High level drinker	39(13.7)	245(86.3)	1.07 (0.61,1.90)	1.03 (0.57,1.87)

*= variables having statistically significant association (p-value <0.05) and 1=reference group.

6: Discussion

Our results demonstrated significant difference in waist circumference, MetS, systolic and diastolic blood pressure and diabetes mellitus between prenatal famine exposed and non-exposed group in general in the study setting. The overall prevalence of metabolic syndrome was 13.4% which is lower compared to Dutch study (32%) (38). This difference could be existing socioeconomic disparity, criteria used to diagnose metabolic syndrome; the Dutch study used the National Cholesterol Education Program definition whereas the current study use IDF. Age and racial difference of the study participants might be another possible justification.

The prevalence of metabolic syndrome among adults in prenatal famine exposed group was 18.5% and non-exposed group was 8.4%. our finding is comparable with study done on holocaust survivors in which MetS were 17% in fetal exposed adult and 9% of non –exposed adults. But this finding is higher compared to the study done in china in which MetS among adults in prenatal famine exposed group (7.7%) and non-exposed (5.7%) groups (42). This inconsistency could be the difference in methodological factors where the present study had smaller sample, use one to one ratio (exposed non-exposed ratio) comparison for the outcome, racial difference, age difference of study participants and time difference where chines study done 8 years back (2011) from current study (2019). Another reason could be difference in using diagnostic criteria for MetS, china study use ATPIII in which it needs higher cut off for central obesity and fasting plasma glucose for MetS definition whereas present study use IDF for the diagnosis of MetS.

Contrarily the present prevalence of MetS was lower compared to two other china study where prevalence of MetS in the non-exposed (16.4%) and fetal exposed was 20.1%. (43) and report from another china study in which MetS in non-exposed (25.2%) and fetal exposed (26.9%) group (44).This discrepancy could be explained by methodological difference where the china study had larger sample, studied participants at different age and racial difference and chines study had relatively had longer duration (about 3 years). Developmental difference in which china were developed country in which the nutritional transition, use of technology and others favors in high metabolic syndrome as compared to our country.

The present study reported significant association between prenatal famine exposed adults and MetS. Adult who had prenatal famine exposure history were 2.25 times more likely to have a risk of metabolic syndrome as compared to non-exposed group. This report is supported with other similar studies conducted earlier (43,45,47). This finding explained by barker hypothesis in which

adults of the MetS may originate from adverse conditions during gestation and may depend on the timing and nature of the insult in utero. Organs and tissues are more vulnerable during periods of rapid growth and development, the so-called critical periods. Thus, exposure to famine during a specific period of gestation may lead to problems associated with the organs or physiologic systems that are undergoing development at that particular phase of gestation (37,38).

Prenatal famine exposure impact on adult chronic disease were explained in the different ways, by lower number of nephrons in kidney, lower number of β pancreatic cells in pancreas, lower number of cardio myocyte in heart and optimizing growth of the central nervous system.

Second, Fetal under nourished baby may also establish “thrifty” way of handling food. For example, Insulin resistance may be viewed as persistence of a fetal response by which blood glucose concentrations were maintained for the benefit of the brain, but at the expense of glucose transport into the muscles and muscle growth and others organs.(5) .

Prior study on the Ethiopian migrants to Israel were strengthen our finding in which the Felisha who prior living in repeatedly famine attacked area and get adult hood post-natal mismatch result in high prevalence of diabetes mellitus (33,63).

unlike to the china famine study this study find significant association between the adult prenatal famine exposure and risk of MetS (44) .This might be partly due to the different duration of famine Compared to the china famine, the great Ethiopian famine had relatively small duration (about 2 years) however china famine lasted 3 years. Racial difference and use of different diagnostic criteria for MetS diagnosis might be another potential reason to explain the different findings. Other possible reason could be the china study participants were retired workers and they are already survived the hard ship, whereas the present study participants were young age.

Our finding also disagree with the Dutch famine study, current study revealed significant association between adult prenatal famine exposure and risk of MetS (38) .This might be partly due to the different duration of famine period, the great Ethiopian famine had a longer duration (about 2 years) however Dutch famine lasted six months which does not cover full gestational period , socio economic difference in which Dutch is developed country where early catch up would happened, use of different criteria to identify famine exposed group which Dutch study use daily ration and birth registration data while current study use birth date. Racial difference and use of different diagnostic criteria for MetS might be another potential reason to explain the different findings.

The current finding revealed low physical activity were associated with MetS. Similar finding support this result from EPHI, 2016 and National NCDs STEPS Survey, 2015. This could be explained in such a way that the life style practice of Ethiopian was changed because of the recent urbanization and modernization which favors for sedentary way of life and later risk for adult chronic disease. On other hand adult with prenatal exposure were further increase the risk of MetS in which explained by the synergetic effect of low physical exercise with previous famine exposure history

Current study revealed that there is significant difference in systolic (2.23 mmHg and diastolic (2.47 mmHg) blood pressure between fetal exposed and non-exposed group. The results were in line with the findings of the Dutch (systolic 2.77 mmHg and diastolic 1.27mmHg) (49) and china (systolic 2.2 mmHg and diastolic 0.9mmHg) blood pressure(48). Our finding is lower than study conducted in Nigeria in which in systolic (+7 mmHg) and diastolic (+5 mmHg) blood pressure in fetal exposed group as compared to counterpart (39). This discrepancy could be the Nigerian study SBP/DBP difference were from pooled fetal –infant exposure as compared with our finding in which the difference come from only prenatal famine exposed group. However, our finding is higher as compared to earlier china study (SBP/DBP was about 0.7/ 0.7 mmHg higher in subjects exposed to famine.(64) .However, siege of Leningrad study did not support our finding.(65). This could be Leningrad study had small sample size and had racial difference.

Diabetes mellitus related prevalence among adult who had prenatal famine exposed was 23.4% and non-exposed group was 11.6% in the current study. This finding is in line with study done in china in which 9.8% (non-exposed) and 22.6% were exposed group (53) and but lower to Holocaust famine study in which exposed (32.9%) and non-exposed group (17.4%) (50) however ,it was higher than two china study (23,51) .This difference could be explained by geographical and other differences between the population involved in our study and the previous study. Another possible explanation were use of different in measurement of bio chemical test.

7. Strength and limitation of the study

7.1. Strength of the study

Subjects born in the transitional period were excluded; there was no late gestational overlap with famine in the unexposed group.

Laboratory analyses were done in star regional laboratory branch outside the study area.

Include all nutritional assessment method.

7.2 Limitation of the study

Lack of age matched true non-exposed group in the same area to see the real effect of famine on adulthood metabolic status.

Lack of birth weight data which is the most commonly used index for fetal undernutrition.

Age estimation were from self-reported of respondent's miss classification of exposed and non-exposed group would be occurred.

The data were self-report from the participants; thus subject to recall bias. However, due attention was given to the entire procedure of data collection; its effect might not be a threat to the findings of the study

8. Conclusions

Prenatal famine exposure is associated with increased risk of metabolic syndrome during adulthood. There is also a significance difference in waist circumference, systolic and diastolic blood pressure, fasting plasma glucose level among exposed adult compared to non-exposed adults.

Moreover, Low physical activity level was identified as one of the predictors for MetS among studied adults.

9. Recommendations

Our study indicates that early life environment is critical in development of the metabolic syndrome during adulthood. Recommendations we derived from the present study are:

For Ministry of health /regional health bureau, zonal health office

- The ministry of health should give special due consideration for historical famine exposed area regarding the risk of chronic illness.
- Exceptional emphasis should be given for future primary prevention programs on malnutrition to includes interventions focused on pregnant women nutrition
- Strengthening the existing programs on essential nutrition action
- Strengthening current chronic illness programs and strategies with special focus on historically famine exposed regions

For researchers

- Future studies consider molecular studies will provide to investigate the causative role of early life famine exposure in the programming of future MetS, hypertension and diabetes mellitus.
- Consider age matched comparison between famine exposed and non-exposed cohorts to see the real effect of famine on ongoing adulthood chronic disease.

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Annex 1. Participant's consent informant

Good morning/afternoon;

Hello. My name is -----I am interviewing participants in this zone to assess adulthood metabolic status among survived adult of the Ethiopian Great Famine in North wollo zones

Dear respondents;

Thank you for being cooperative to answer for the valid and effective completion. All what you have told will be kept in secret and you are not expected to tell your name and your name is not going to be registered. A code number will identify every participant. The interview is voluntary; you have the right to participate or not to participate at any time during the interview. Your refusal will not have any effect on the services that you or any of your family receives. Your participation is important to fulfil the study and in order to help to design appropriate intervention to reduce the effect of starvation during the prenatal in this zone and other similar settings. Therefore, you are kindly requested to give genuine answers according to the questions. You can ask questions to the interviewer for clarification.

Moreover, as part of this research project, we are asking people over the Kebeles to measure their height, weight, waist and hip circumference, blood pressure measurement and take blood samples for fasting blood glucose test and lipid profile tests. Besides, there will be interview on sociodemographic, behavioral risk factors, dietary habit assessment. This is to determine metabolic syndrome which comprises hypertension, dyslipidemia, diabetes mellitus and abdominal obesity. These problems are a serious health problem that usually results from starvation during intrauterine life, childhood period and adolescent period. This survey will assist the government to develop programs to prevent and treat chronic disease.

For these test, we will need a few drops of blood from a finger. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after we take your blood. The blood will be tested for fasting blood glucose immediately, and the result will be told to you right away. The result will be kept strictly confidential and will not be shared with anyone other than members of our survey team.

Risk and /or Discomfort

By participating in this research project you may lose around ___ minutes. There is no risk in participating in this research. Benefits

If you are participating in this research, there may not be direct benefit to you but your participation is likely to help us in showing the effect of prenatal starvation on adulthood metabolic syndrome that help in decision making for stakeholders. Incentives/Payments for Participating

You will not be provided any incentives or payment to take part in this project. Confidentiality
The information collected for this research project will be kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but a code number assigned to it. This data will not be revealed to anyone except the principal investigator and assistants will be kept locked with key.

Right to Refusal

You have full right to refuse from participating in this research and this will not affect you from getting any kind of health service. You have also the full right to leave from this study at any time you wish, without losing any of your right. Person to contact

This research project will be reviewed and approved by the ethical committee of the Jimma University. If you want to know more information you can contact through the address below. If you have any question you can contact any of the following individuals and you may ask at any time you want.

1. Mr .Habtamu Hasen MSc student at Jimma University
Mobile: +25138641297 e.mail: habtamu130@gmail.com

Is the information/ objective clear? 1) Yes 2) No

Are you willing to participate in the interview? It is up to you to decide

1) Yes 2) No

Thank you!

Annex 2: English version Questionnaire

Instruction: This is a structured questionnaire designed for the study of adulthood metabolic profile of the Great Ethiopian Famine survivors who in the age of 30- 36 years at the time of the famine in North Wollo provinces, Northeast Ethiopia, 2019.

Note: *Get consent before interviewing performing any activity.*

Questionnaire ID No/code _____

Date of interview _____

Zone _____ Kebele _____ Got _____ Village _____

SECTION A: QUESTIONS RELATED TO 1975-77 E.C ETHIOPIAN GREAT FAMINE and Verbal autopsy Questionnaire		
A1	Place of Birth	_____
A2	Age	_____ years
A3	Birth date	__ / __ / ____ I don't know
A3a	If A3 unknown : What was your age during 1975-77 E.C Great Ethiopian Famine (kifu ken)? Probe Use local calendar Age in completed years	_____ month _____ years 0 pregnant I don't know
A3b	If A3a (pregnant) : What was your gestational age?	_____ weeks
A4	How do you feel about the burden of 1975-77 E.C Great Ethiopian Famine? If he/she can remember?	1. Hardly 2. Little 3. I don't know
A5	Did you have sufficient foods or resources to cope up the famine?	1 Yes 0 No
A6	Did anybody die due to famine in your home?	1 Yes 0 No
A6a	If yes to A6, Number of males deceased?	_____ number I don't know
A6b	If yes to A6, Number of females deceased	_____ number I don't know
A6c	If yes to A6, what was the place and date of death	Place of death ____ Date of death ____ I don't know
A6d	If yes to Question A6, how many people died in your home?	_____ (number of people dies in the Household)
SECTION B. Household Wealth index		
<i>Now I will ask you about some fixed assets that your household have</i>		
Does the household have any of the following properties? (Circle)		Yes No
B1	Functioning radio/Tape recorder/CD player	1 0

B2	Functioning Television	1	0
B3	Solar light	1	0
B4	Kerosene stove	1	0
B5	Electric stove	1	0
B6	Bicycle	1	0
B7	Motor Cycle	1	0
B8	Cart/Gari	1	0
B9	Watch (Hand/Wall)	1	0
B10	Mobile phone	1	0
B11	Plough	1	0
B12	Sofa	1	0
B13	Spring mattress	1	0
B14	Sponge/Foam mattress	1	0
B15	Cotton mattress	1	0
B16	Grass Mattress	1	0
B17	Chair/Stool	1	0
B18	Generator	1	0
B19	Milling	1	0
B20	Water pump	1	0
	Does the household have any of the following animals?	1. Yes 0. No	How many?
B21	Oxen		
B22	Cows		
B23	Horse/mules/donkey/Camel		
B24	Goats/Sheep		

SECTION C: Background information of the participants		
I first ask you questions about yourself and your family:		
C1	What is the sex of the participant? (Record Male/Female as observed)	1 Male 0 Female
C2	Where is your place of residence?	1. Rural 2. Urban
C3	What is your religion?	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Other specify_____)
C4	What is your ethnicity?	1. Amhara 2. Oromo 3. Tigrie 4. Other(specify_____)
C5	What is your educational status?	1. Can't read and write 2. Primary school (1-8) 3. Secondary school (9-12) 4. More than secondary (>12)
C6	What is your current marital status?	1. Single

		2. Married 3. Divorced/Separated 4. Widowed
C7	What is your occupation?	1. Government employee 2. Non-government employee 3. Farmer 4. Housewife 5. Merchant 6. Other (specify)
C8	Do you have a child less than 5 years?	1 Yes 0 No
C9	How many family members including you in your house	_____ number

SECTION D: Substance use of the respondents		
1. Tobacco Use		
Now I am going to ask you some questions about tobacco use.		
D1	Do you currently smoke any tobacco products, such as cigarettes, cigars or pipes, gaya?	1 yes 0 No, <i>If no, go to D5</i>
D2	Do you currently smoke tobacco products daily?	1 Yes 0 No
D3	How old were you when you first started smoking?	Age in years _____ 77 Don't know
D4	<i>On average, how many of the following do you smoke each day/week? (IF LESS THAN DAILY, RECORD WEEKLY)</i> <i>(RECORD FOR EACH TYPE)</i>	1. <i>Manufactured cigarettes</i> _____ 2. <i>Gaya</i> _____ 3. <i>Other (specify _____)</i> 77 <i>Don't know</i> __
D5	<i>In the past 12 months, did you ever smoke any tobacco products?</i>	1 Yes 0 No
D6	<i>In the past 12 months, did you ever smoke daily?</i>	1 Yes 0 No
D7	<i>Do you currently use any smokeless tobacco such as [snuff, chewing tobacco]?</i>	1 Yes 0 No <i>If No, go to D10</i>
D8	<i>Do you currently use smokeless tobacco products daily?</i>	1 Yes 0 No

D9	<i>On average, how many times a day do you use (IF LESS THAN DAILY, RECORD WEEKLY). (RECORD FOR EACH TYPE, USE SHOWCARD)</i>	1. Snuff, by mouth _____ 2. Snuff, by nose _____ 3. Chewing tobacco _____ 4. Other (specify) _____ Don't Know _____
D10	<i>In the past 12 months, did you ever use smokeless tobacco such as [snuff, chewing tobacco]?</i>	1 Yes 0 No
D11	<i>During the past 30 days, did someone smoke in your home?</i>	1 yes 0 No
D12	<i>During the past 30 days, did someone smoke in closed areas in your workplace (in the building, in a work area or a specific office)?</i>	1 Yes 0 No
2. Alcohol consumption		
The next questions ask about the consumption of alcohol.		
D13	<i>Have you ever consumed any alcohol such beer, Tella, korefie, Tej, Arake, wine, [add other local examples]?</i>	1. Yes 0 No if no go to D22
D14	<i>Have you consumed an alcoholic drink within the past 12 months?</i>	1 yes 0 No
D15	<i>During the past 12 months, how frequently have you had at least one alcoholic drink?</i>	1. Daily 2. 5-6 days per week 3. 1-4 days per week 4. 1-3 days per month 5. Less than once a month
D16	<i>Have you consumed an alcoholic drink within the past 30 days?</i>	1. Yes 0. No If No, Go to D22
D17	<i>During the past 30 days, on how many occasions did you have at least one alcoholic drink?</i>	Number _____ Don't know
D18	<i>During the past 30 days, when you drank alcohol, on average, how many standard alcoholic drinks did you have during one drinking occasion?</i>	Number _____ 77 Don't know
D19	<i>During the past 30 days, when you consumed an alcoholic drink, how often was it with meals? Please do not count snacks.</i>	1. Usually with meals 2. Sometimes with meals 3. Rarely with meals 4. Never with meals
D20	<i>During the past 7 days, how many standard alcoholic drinks did you have?</i>	Number _____ Don't know _____
D21	<i>During the past 7 days, did you consume any homebrewed alcohol, like Tella, Tej, Katikalla, korefie?</i>	1 Yes 0 No
1. Khat use		
Now I am going to ask you some questions about Khat chewing		
D22	Have you ever chewed Khat?	1 Yes 0 No, if No go to E1

D23	Do you currently chew Khat?	1 Yes 0 No
D24	<i>During the past 12 months, how frequently did you chew Khat?</i>	1. Daily 2. 5-6 days per week 3. 3-4 days per week 4. 1-2 days per week 5. 1-3 days per month 6. Less than once a month
D25	<i>On average, how many bundles of Khat do you chew each/day week? (IF LESS THAN DAILY, RECORD WEEKLY)</i>	Bundles of Khat____ Don't know
D26	<i>Do you currently smoke tobacco products while chewing Khat?</i>	1 Yes 0 No
D27	<i>In the past 12 months, did you ever smoke tobacco products while chewing Khat?</i>	1 Yes 0 No
D28	<i>Do you currently drink alcohol after you chew Khat?</i>	1 Yes 0 No

SECTION E: PHYSICAL ACTIVITY: I am going to ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

READ: Now, think about all the **vigorous** activities which take *hard physical effort* that you did in the last 7 days. Vigorous activities make you breathe much harder than normal and may include heavy lifting, digging, aerobics, or fast bicycling. Think only about those physical activities that you did for at least 10 minutes at a time.

E1	During the last 7 days , on how many days did you do vigorous physical activities?	_____ <i>days</i> 77 <i>Don't Know/not sure</i>	[Interviewer clarification: Think only about those physical activities that you do for at least 10 minutes at a time.]. [Interviewer note: If respondent answers zero, or does not know, skip to Question E3]
E2	How much time did you usually spend doing vigorous physical activities on one of those days?	_____ <i>Minutes per day</i> 77 <i>Don't Know/not sure</i>	If the respondent can't answer because the pattern of time spent varies widely from day to day, ask Q E2-1
E2-1	"How much time in total would you spend over the last 7 days doing vigorous physical activities?"	_____ <i>hours per week</i> <i>Don't Know/not sure</i>	

READ: Now think about activities which take *moderate physical effort* that you did in the last 7 days. Moderate physical activities make you breathe somewhat harder than normal and may include carrying light loads, bicycling at a regular pace, or doubles tennis. Do not include walking. Again, think about only those physical activities that you did for at least 10 minutes at a time.

E3	During the last 7 days , on how many days did you do moderate physical activities?	_____ <i>days</i> 1. <i>Don't Know/not sure</i>	[Interviewer clarification: Think only about those physical activities that you do for at least 10 minutes at a time.]. [Interviewer note: If respondent answers zero, refuses or does not know, skip to Question E5]
E4	How much time did you usually spend doing moderate physical activities on one of those days?	_____ <i>Minutes per day</i> 77 <i>Don't Know/not sure</i>	If the respondent can't answer because the pattern of time spent varies widely from day to day, ask Q E4-1
E4-1	What is the total amount of time you spent over the last 7 days doing moderate physical activities?	_____ <i>hours per week</i> 77 <i>Don't Know/not sure</i>	

READ: Now think about the time you spent **walking** in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

E5	During the last 7 days , on how many days did you walk for at least 10 minutes at a time?	___ <i>days per week</i> 77 <i>.Don't Know/not sure</i>	[Interviewer clarification: Think only about those physical activities that you do for at least 10 minutes at a time.] If respondent answers zero, refuses or does not know, skip to Question E7]
E6	How much time did you usually spend walking on one of those days?	___ <i>Hours per days</i> 77 <i>.Don't Know/not sure</i>	If the respondent can't answer because the pattern of time spent varies widely from day to day, ask Q E6-1
E6-1	“What is the total amount of time you spent walking over the last 7 days? ”	___ <i>hours per week</i> 77 <i>.Don't Know/not sure</i>	
READ: Now think about the time you spent sitting on week days during the last 7 days. Include time spent at work, at home, while doing course work, and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television.			
E7	During the last 7 days, how much time did you usually spend sitting/reclining on a weekday?	___ <i>minutes per weekday</i> 77 <i>.Don't Know/not sure</i>	Interviewer clarification: Include time spent lying down (awake) as well as sitting] [Interviewer probe: If the respondent can't answer because the pattern of time spent varies widely from day to day, go to section F
E8	“What is the total amount of time you spent sitting last Wednesday? ”	___ <i>Hours on Wednesday</i> ___ <i>Minutes on Wednesday</i> 77 <i>Don't Know/not sure</i>	

SECTION F: Food frequency questionnaire (FFQ)

Thinking back on the last 12 months, please tell me the how often you consumed each of the following items. **0 IF NEVER CONSUMED THE ITEM.**

Food list	Frequency	Food list	Frequency
F1. Teff	Never consumed	F2. Maize	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F3. Barely	Never consumed	F4. Wheat including bread	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F5. Sorghum/millet	Never consumed	F6. Rice	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day

	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
	Never consumed		Never consumed
	1 time per month or less		1 time per month or less
G7. Beef	2-3 times per month	G8. Chicken	2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
G9. Fish	Never consumed	G10. Liver	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
G11.Goat/la mb	Never consumed	G12.preserved meat	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day

	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F13. Milk	Never consumed	F14. Cheese	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F15. Butter	Never consumed	F16. Egg	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F17. Nuts	Never consumed	F18. Oil	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day

	2-3 times per day		2-3 times per day		
	4-5 times per day		4-5 times per day		
	6 or more times per day		6 or more times per day		
	Never consumed		Never consumed		
	1 time per month or less		1 time per month or less		
F19.Beans, peas, lentils, chickpeas	2-3 times per month	F20. Sweet potato	2-3 times per month		
	1-2 times per week		1-2 times per week		
	3-4 times per week		3-4 times per week		
	5-6 times per week		5-6 times per week		
	1 time per day		1 time per day		
	2-3 times per day		2-3 times per day		
	4-5 times per day		4-5 times per day		
	6 or more times per day		6 or more times per day		
			Never consumed		Never consumed
	1 time per month or less		1 time per month or less		
F21.Potatoes	2-3 times per month	F22. Carrot	2-3 times per month		
	1-2 times per week		1-2 times per week		
	3-4 times per week		3-4 times per week		
	5-6 times per week		5-6 times per week		
	1 time per day		1 time per day		
	2-3 times per day		2-3 times per day		
	4-5 times per day		4-5 times per day		
	6 or more times per day		6 or more times per day		
			Never consumed		Never consumed
			1 time per month or less		1 time per month or less
F23.Tomato	2-3 times per month	F24. Cauliflower	2-3 times per month		
	1-2 times per week		1-2 times per week		
	3-4 times per week		3-4 times per week		
	5-6 times per week		5-6 times per week		
	1 time per day		1 time per day		

	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F25. Leafy green vegetables	Never consumed	F26. Avocado	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F27. Papaya	Never consumed	F28. Bananas	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F29. Pineapple	Never consumed	F30. Oranges	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day

	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F31. Onion	Never consumed	F32. Garlic	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F33. Ginger	Never consumed	F34. Chills	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F35. Coffee	Never consumed	F36. Local drink	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day

	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F37. Soft drink	Never consumed	F38. Salt	Never consumed
	1 time per month or less		1 time per month or less
	2-3 times per month		2-3 times per month
	1-2 times per week		1-2 times per week
	3-4 times per week		3-4 times per week
	5-6 times per week		5-6 times per week
	1 time per day		1 time per day
	2-3 times per day		2-3 times per day
	4-5 times per day		4-5 times per day
	6 or more times per day		6 or more times per day
F39. Eating outside the home	Never consumed	F40. Over the past 12 months, did you skip any of your meals?	1 yes 0 No
	1 time per month or less	F40a. If yes, which of the following meals did you skip?	1. Breakfast 2. Lunch 3. Dinner
	2-3 times per month		
	1-2 times per week		
	3-4 times per week		
	5-6 times per week		
	1 time per day		
	2-3 times per day		
	4-5 times per day		
	6 or more times per day		
F41. What type of oil or fat is most often used for meal preparation in your household?		1. Vegetable oil 2. Palm oil 3. Butter or ghee 4. Other (specify)	
F42. do you eat that were not prepared at a home? By meal, I mean breakfast, lunch and dinner.		1 yes 0 No	

SECTION J: HISTORY OF HYPERTENSION, DIABETES		
I First ask you questions about History of Raised Blood Pressure		
J (1)	<i>Are you currently receiving any treatments/advice for high blood pressure prescribed by a doctor or other health worker?</i>	1 Yes 0 No
J (2)	<i>Has any of your family members (biological parents, siblings or children) ever had raised blood pressure or hypertension?</i>	1 yes 0 No
History of Diabetes		
J (3)	<i>Are you currently receiving any treatments/advice for diabetes prescribed by a doctor or other health worker?</i>	1 Yes 0 No
J (4)	<i>Has any of your family members (biological parents, siblings or children) ever had raised blood sugar or Diabetes?</i>	1 Yes 0 No
SECTION K: ANTHROPOMETRIC MEASUREMENT		
K1	Height Double measurement	___ (cm)[for measurement 1 ___(cm)[for measurement 2]
K2	Weight Double measurement	___kg for measurement 1 ___kg for measurement 2
K3	Waist circumference No need to measure for pregnant mothers	_____Centimeters (cm)
K4	Hip circumference	_____Centimeters (cm)
SECTION L: BLOOD PRESSURE (BP) MEASUREMENT		
L1	<i>Reading 1</i>	Systolic (mmHg) _____ Diastolic(mmHg) _____
L1-1	<i>Reading 2</i>	Systolic (mmHg) _____ Diastolic (mmHg) _____

SECTION M: BIOCHEMICAL MEASUREMENTS		
First, I will measure your blood glucose level.		
This test is taken to measure raised blood sugar levels which are a risk factor for diabetes. For this purpose, blood is going to be collected from a small prick on the finger <i>During the past 8 hours have you had anything to eat or drink, other than water?</i>		
If the answer is No, I will not measure your blood glucose level		
Time of day blood specimen taken (24-hour clock) Hours _____		
M3	<i>Fasting blood glucose Choose accordingly: mmol/l or mg/dl</i>	_____mmol/L _____mg/dl Refused
M4	<i>Today, have you taken insulin or other drugs (medication) that have been prescribed by a doctor or other health worker for raised blood glucose?</i>	1Yes 0 No

Lipids profiles: This is to know your blood cholesterol level. Triglyceride test is taken to measure the fasting levels of natural fats in the bloodstream. For this purpose, the blood will be withdrawn from your fingertip.		
M5	Total cholesterol Choose accordingly: mmol/l or mg/dl	_____mg/dl Refused
M6	During the past two weeks, have you been treated for raised cholesterol with drugs (medication) prescribed by a doctor or other health worker?	1. Ye 0 No
M7	Triglycerides Choose accordingly: mmol/l or mg/dl	_____mg/dl Refuse
M8	HDL Cholesterol Choose accordingly: mmol/l or mg/dl	_____mg/dl Refuse

Thank you so much!

AMHARIC VERSION QUESTIONERS

በጥናቱ ለመሳተፍ ስለጥናቱ ለተሳታፊዎች የሚሰጥ መረጃ

እኔ ስሜ _____ የተባልኩት በጅማ ዩኒቨርሲቲ በፋሚሊሄልዝ ናፖፕሌሽን ትምህርት ቤት የድህረ ምረቃ ተማሪ ና በጤናና ህክምና ሳይንስ መምህር በሆኑት የሚሰሩ የጥናት ርዕሰ በሜታሶሊክ በሽታና ተያያዥነት ያላቸውን ምክንያቶች በስኳር እና ደምግፊት በሽተኞች የሚካሄደው ጥናት ላይ መረጃ ሰብሳቢ ነኝ ። እውነተኛ ሀሳቦን ካከፉ ለችግሩ መነሻ የሆኑትን ጉዳዮች ለማወቅ ይረዳናል ። እርሶ ስለጥናቱ የሚሰጡትን መረጃ ከተረዱ በውሳኔ ሊሳተፉ ይችላሉ። የጥናቱ አላማ

የዚህም ርዕሰ-ፕሮጀክት አላማ ተላላፊ ያልሆኑ በሽታዎችና ተያያዥነት ያላቸውን ምክንያቶች የአዋቂ እድሜያቸው ከ 30 ዓመት ለከዚያ በላይ የሆኑ የስኳር በሽታ ደምግፊት እና የሰውነት ስብ መጠን በነጻ ማጥናትና መለየት ነው። በነዚህ የህብረተሰብ ክፍሎች የስኳር ና ደም ግፊት በሽታ ምን ያህል እንደሆነ እና ተያያዥ ምክንያቶችን መለየት ለሚመለከታቸው ክፍሎች ሆስፒታል ወይም የክልሉ ጤና ቢሮ በግላዮች ትኩረት እንዲሰጡት ማድረግ እንፈልጋለን ።

የአሰራር ሂደት፡ የተጠቀምንበት የጥናት ናሙና አወሳሰድ ቴክኒክ እርስዎን እንድናካትት አድርጎናል። ከእርሶ መረጃውን በቃለ መጠይቅ፣ ከደም ናሙና መረጃ እሰበስባለሁ። የመረጃ ሰብሳቢዎች የሜታሶሊክ (ተላላፊ ያልሆኑ) በሽታና ተያያዥነት ያላቸውን ምክንያቶች በአዋቂ የስኳር በሽተኞችን ፣ ደምግፊት እና የሰውነት ስብ መጠን ለማወቅ ጥያቄዎች ይጠየቃሉ ። ጥያቄዎችም ማህበራዊና ስነ- ህዝባዊ ፣ ማህበራዊ- አኮኖሚያዊ፣ ጤናና

እና ባህሪያዊ ጉዳዮች ዙሪያ በተመለከተ ይጠይቃሉ። ከእርሶ 5 ሚሊ ሊትር ደም የስኳር እና የሰውነት-ስብ መጠኖን ለመለካት እንጠቃመለን። በዚህ ጥናት አንደሚካፈሉ ተስፋ እናደርጋለን ። መጠይቁ ከ 30 -60 ደቂቃዎች ይወስዳል ። ከዚህም በኋላ ይጠናቀቃል ። አደጋዎች ወይም አለመመቻት ለመከላከል የሚጠበቁ ጥቅሞች በዚህ ጥናት በመሳተፊያ የሚያጋጥሙዎት አደጋ የለም ። ከእርሶ 5 ሚሊ ሊትር ደም የስኳር መጠኖን ለመለካት እና ለሌሎች የሜታቦሊክ ችግር አመላካች መረጃዎችን ለመሰብሰብ ። በጥናቱ ላይ እርሶ የስኳርና ደም ግፊት ችግር ከተገኛለዎት ወደ ሆስፒታል ለበለጠ ህክምና ይላካሉ። በጥናቱ ወቅትም ምን ማድረግ እንዳለበዎት ይነገርታል። እርስዎ በጥናቱ በመካፈልዎ በሚሰጡት መረጃ የሚያገኙት ልዩ ጥቅም የለም። የስኳርና ደም ግፊት በሽታና ተያያዥነት ያላቸውን ምክንያቶች በስኳርና ደም ግፊት በሽተኞች ምክንያቶች በተመለከተ መረጃ ለማቅረብና ችግሮቻቸውን ለመቅረፍ ያስችል ዘንድ ስልቶችን ለመንደፍ ይጠቅማል ። በነዚህ በስኳርና ደም ግፊት በሽተኞች ህክምና፤ ድጋፍና እንክብካቤ ዙሪያ ለሚሰሩ መንግስታዊና መንግስታዊ ያልሆኑ ድርጅቶች ፕሮግራሞቻቸውን ለማሻሻልም ይረዳል። ሚስጢር መጠበቅ የሚሰጡት መልስም ሆነ የጥናቱ ውጤት በሚስጢራዊነት ይጠበቃል። ለዚህ ጥናት የሚሰበሰበው እርስዎን የሚመለከት መረጃ በማህደር የሚቀመጥ ሲሆን ማህደሩን በርስዎ ስም ሳይሆን በተለየ ኮድ ስለሚቀመጥ ከዋናው ተመራማሪ በስተቀር ለማንም አይገለጽም። ፈቃደኝነት

እርስዎ በጥናቱ ውስጥ መካፈል ካልፈለጉ መሳተፍ የለበዎትም ። ከጥናቱ ውስጥ በማንኛውም ጊዜ አቋርጠው መውጣት መብትዎ ነው። በጥናቱ መካፈል በማቋረጥዎ ምንም ነገር አይባሉም በጤና ባለሙያዎች የሚሰጥዎት ድጋፍና እንክብካቤም አይጓደልብዎትም ። ጥያቄ ካለዎት መረጃ ሰብሳቢውን ይጠይቁ። ወደፊትም ቢሆን ያልተረዱት ነገር ካለ ሊጠይቁ ይችላሉ። ተመራማሪዎቹ በጥናቱ ጊዜ አዲስ መረጃዎች ካጋጠሟችሁ ያሳውቅዎታል። የተመራማሪው አድራሻ ከላይ ከተሰጠዎት መረጃዎች ውስጥ ግልጽ ያለሆነለዎት ከሆነ ወይም ተጨማሪ መረጃ የሚፈልጉ ከሆነ ከዚህ በታች ባለው አድራሻ ተመራማሪውን ሊያገኙ ይችላሉ።

1. ዶ/ር ቃልኪዳን ሀሰን: ስልክ ቁጥር 0911370862 ኢ-ሜይል newewi333@gmail.com
2. ጌታቸው አራጌ: ስልክ ቁጥር 0910435581 ኢ-ሜይል getachewarage2004@gmail.com
3. ሀብታሙ ሀሰን: ስልክ ቁጥር 09038641297 ኢ-ሜይል habtamu130@gmail.com
4. ከማል ሀጂማህሙድ: ስልክ ቁጥር 0912255990 ኢ-ሜይል Kemal.mehmoud@gmail.com
 በዚህ ጥናት ላይ ችግር ከገጠሞት የጂማ ዩንቨርስቲ የጤናና ህክምና ሣይንስ ኮሌጅ የጥናትና ምርምር ስነ ምግባር ኮሚቴ በቢሮ ስልክ ቁጥር 0471111450 ወይም በ ፖ.ሣ.ቁ 278 ጂማ መረጃ ሊያገኙ ይችላሉ።

በጥናትና ምርምር ለመሳተፍ ፍቃደኛተዎን ስለመስጠት ከላይ ስለ ጥናቱ ያለውን መረጃውን ተነባላችሁ ወይም በሚገባኝ ቋንቋ ስለጥናቱ አላማ፤ የአሰራር ሂደት፤ ጉዳዮች ወይም አለመመቻት

ና የሚጠበቁ ጥቅሞች፤ ሚስጢር መጠበቅ ፤ ፈቃደኝነት፡ ለበለጠ መረጃ የተመራማሪው ና ጂማ ዩኒቨርሲቲ የጤናና ህክምና ሳይንስ ኮሌጅ የጥናትና ምርምር ስነ ምግባር ኮሚቴ አድራሻ ተነግሮኛል ። ስለዚህ ጥናቱ ላይ ለመሳተፍ ተስማምቶአለሁ።፤ የጥናቱ ተሳታፊ ፊርማ -----

የአማርኛ መጠይቅ

የዚህ ምርመራ ፕሮጀክት አላማ ተላላፊ ያልሆኑ በሽታዎችና ተያያዥነት ያላቸውን ምክንያቶች ለማጥናት ነው። ለዚህም ጥናት የሚሳተፉት እድሜያቸው ከዓመቶቹ ከዚያ በላይ የሆኑ አዋቂዎች ናቸው። በነዚህ የህብረተሰብ ክፍሎች የስኳርና ደም ግፊት በሽታ ምን ያህል እንደሆነ እና ተያያዥ ምክንያቶችን በመለየት ለሚመለከታቸው ክፍሎች ሆስፒታል ወይም የክልሉ ጤና ቢሮ በማሳየት ትኩረት እንዲሰጡት ማድረግ እንፈልጋለን ።.

የጥያቄው መለያ ኮድ _____

መረጃ ሰብሳቢው ስም _____

ፊርማ የተቆጣጣሪ ስም _____ ፊርማ

ጥያቄው የተጀመረበት ቀን _____

_____ ቀን፡-----

_____ ቀን፡-----

ሰዓት -----

ክፍል A: ከ 77 ዓ.ም የኢትዮጵያ ታላቁ ረሃብ ጋር የተያያዙ ጥያቄዎች			
1975-			
A1	የተወለዱበት ቦታ		
A 2	እድሜ ዎት ስንት ነዉ.	_____ ዓመት	
A 3	የተወለዱበት ጊዜ	_____ ቀን/ወር/ዓ.ም	
A 3a	የተወለዱበት ጊዜ ከላወቁት በ 1976-77 ዓ.ም የኢትዮጵያ ታላቁ ረሃብ እድሜህ ሽ/ስንት ነበር?	_____ ዓመት _____ ወር 0 ተረግሻ ነበር 77 አላውቀዉም	
A3b	መልስዎ ተረግሻ ነበር ከሆነ እርግዝናዉ ስንት ወር ነበር	----- ወር አላውቀዉም	
A 4	የሚያስታዉሱ ከሆነ የ 1976-77 ታላቁ የኢትዮጵያውያን ረሃብ እንደት ይገልጹታል?	1. በጣም ከባድ 2. መካከለኛ 3 ምንም አይደለም	
A 5	ረሃቡን ለመቋቋም በቂ ምግብ ወይም ሀብት ነበረዉት?	1 አወን 0 የለም	
A 6	በቤትዎ ውስጥ በረሃብ ምክንያት የሞተው ሰው ነበር?	1 አወን 0 የለም	
A 6a	መልስዎ ለ A6 አወን ከሆነ የሚች እድሜ ስንት ነበር?	_____ ዓመት 77 እኔ አላውቅም	
A 6b	ለ ጥያቄ A6 መልስዎ አወን ከሆነ የሚች ጾታ	1 ወንድ 0 ሴት	
A 6c	መልስዎ ለ A6 አወን ከሆነ የሞተበት ቦታና ጊዜ የት ነው?	የሞተበት ቦታ _____ የሞተበት ጊዜ _____ 77 አላውቀዉም	
A 6d	መልስዎ ለ A6 አወን ከሆነ በቤትዎ ውስጥ ስንት ሰዎች ሞተዋል?	ቁጥር _____	
ክፍል B. የቤተሰብ ሀብት መለኪያ አሁንስለቤተሰብዎ አንዳንድ ቋሚ ንብረቶች እጠይቃለሁ			
የቤተሰብ ሀብት መለኪያ		አዎን	የለም
B 1	የሚሰራ ሬዲዮ ቴፕ ሪከርደር ሲዲ ማጫወቻ አለዎት?	1	0
B 2	የሚሰራ ቴሌቪዥን አለዎት?	1	0
B 3	ሶላር መብራት አለዎት?	1	0
B 4	የነዳጅ ምድጃ አለዎት?	1	0

B 5	የኤሌክትሪክ ምድጃ	1	0
B 6	ብስክሌት አለዎት?	1	0
B 7	ሞተር ሳይክል አለዎት?	1	0
B 8	ጋሪ አለዎት?	1	0
B 9	ሠላት የእጅ የግድግዳ) አለዎት?	1	0
B 10	ሞባይል አለዎት?	1	0
B 11	እረሻ መሬት አለዎት?	1	0
B 13	ሶፋ አለዎት?	1	0
B 14	የስፕሪንግ ፍራሽ አለዎት?	1	0
B 15	ስፖንጅ ፍራሽ አለዎት?	1	0
B 16	የጥጥ ፍራሽ አለዎት?	1	0
B 17	ሣር ፍራሽአለዎት?	1	0
B 18	ወንበር በርጨማአለዎት?	1	0
B 19	ጅነሬተርአለዎት?	1	0
B 20	ወፍጮ አለዎት?	1	0
B 21	የውሃ ፓምፕአለዎት?	1	0
	ቤት ውስጥ የቤት እንስሳት አሉ?	አወን የለም	ስንት ናቸው በቁጥር?
B 22	በሬዎች		
B 23	ለም		
B 24	ፈረስ /በቅሎዎች /አህያ/ግመል		
B 25	ፍየሎች በጎች		
ክፍል C: ስለተሳታፊዎች ማህበራዊ መረጃ			
ስለራሱም እና ስለ ቤተሰብም ጥያቄዎችን እንጠይቅዎታለን			
C 1	ፆታ	1 ወንድ 0 ሴት	
C 2	መኖርያ ቦታ	1. ገጠር 2. ከተማ	
C 3	ሀይማኖት?	1ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ ካለ ይጠቀስ }-----	
C4	ብሄርሰብ	1. አማራ 2. አሮሞ 3. ትግሬ 4. ሌላ ካለ ይጠቀስ	

C5	የትምህርት ደረጃ?	1. ማንበብ ናመጸፍ አይችሉም 2. የመጀመሪያ ደረጃ (1-8) 3. ሁለተኛ ደረጃ (9-12)
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		4. ከ12ኛ ክፍል በላይ
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C6	የጋብቻ ሁኔታ	1. ያላገባ 2. ያገባ 3. የተፋቱ 4. የሞተበት ባት
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C7	የስራ ሁኔታ?	1. የመንግስት ስራተኛ 2. የግል መስሪያ ቤት ስራተኛ 3. አርሶ አደር 4. የቤት እመቤት 5. ነጋዴ 6. ሌላ ካለ ይጠቀስ)-----
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C8	እድሜያቸው ከ ዓመት በታች ህጻን አለው ?	አወን 0 የለም
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C9	አንተን/አንቺን ጨምሮ በቤት ውስጥ ስንት ሆናችሁ ነ ወ. የምትኖሩት?	በቁጥር _____
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ክፍል D: ሱስና ሱስነክ ስነምግባር ባህሪያትን በተመለከተ

1. ትምህርትን በተመለከተ

D1	በአሁኑ ጊዜ የትምህርት ምርቶችን ሲጋራ፣ ጋያ ይጠቀማሉ?	1 አዎን 0 የለም, የለም ከሆነ ወደ D5 ይሂዱ.
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D2	በአሁኑ ጊዜ የትምህርት ምርቶችን በየቀኑ ይጠቀማሉ?	1 አዎን 0 የለም
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D3	ሲያጨሰ ለመጀመሪያ ጊዜ እድሜዎ ስንት ነበር?	አመት _____ 77 አላውቀዋልም
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D4	በአማካኝ በሳምንት በወር ምን ያህል ያጨሳሉ?	1. የፋብሪካ ሲጋራ 2. ጋያ 3. ሌላ ካለ ይጠቀስ አላውቀዋልም 77
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D5	ባለፉት 12 ወራት የሲጋራ ምርቶችን ተጠቅመዋል?	1 አዎን 0 የለም
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D6	ባለፉት ወራት በየቀኑ ያጨሰ ነበር?	አዎን 0 የለም
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D7	ጭስ አልባ ትንባሆ በአፍንጫ ማማግ ፣ ትንባሆ ማኘክ ይጠቀማሉ?	1 አዎን 0 የለም መልሰው የለም ከሆነ ወደ ቁጥር D10 ይሂዱ	ጥያቄ
D8	በየቀኑ ጭስ አልባ ትንባሆ በአፍንጫ ማማግ ትንባሆ ማኘክ ይጠቀማሉ?	አዎን 0 የለም	

D9	በአማካኝ ስንት ጊዜ ጭስ አልባ ትንባሆ ይተቀማሉ ?	1. በአፍመሳብ 2. በአፍንጭ መሳብ 3. ማኘክ 4. ሌላካለ ይጠቀስ _____ 77 አላውቀውም	
D10	ባለፉት ወራት ጭስ አልባ ትንባሆ በአፍንጫ ማማግ ትንባሆ ማኘክ ተጠቅመዋል	1 አዎን 0 የለም	
D11	ባለፉት 30 ቀናት ቤት ውስጥ ያጨሱ ነበር?	1 አዎን 0 የለም	
D12	ባለፉት ቀናት ሰዎች ዝግ በሆነ ቦታ ስራቦታ ፣ ቢሮ ያጨሱ ነበር?	1.አዎን 0 የለም	

2. አልኮል አወሳሰድን በተመለከተ

D13	አልኮል ቢራ ጠላ ክረፌ ጠጂ አረቋ ወይን ጠጥታችሁ ታወቃላችሁ?	1 አዎን 0 የለም የለም ከሆነ ወደ D23 ይሂዱ	
D14	ባለፉት 30 ቀናት አልኮል ቢራ ጠላ ክረፌ ወይን ፣ ጠጂ አረቋ ስፕራይት ጠጥታችሁ ታወቃላችሁ??	0 አዎን 0 የለም	
D15	ባለፉት ወራት፣ አልኮልን ስትጥጠጡ በየስንት ጊዜ ይጠጡ ነበር ?	1. ቀንበቀን 2. 5-6 ቀን በላምንት 3. 1-4 ቀን በላምንት 4. 1-3 ቀን በወር 5. ከአንድ ጊዜ በታች በወር	
D16	ባለፉት 30 ቀናት አልኮል ቢራ ጠላ ክረፌ ጠጂ አረቋ ወይን) ጠጥታችሁ ታወቃላችሁ??	1 አዎን 0 የለም ከሆነ ወደ D22 ይሂዱ	
D17	ባለፉት ቀናት አልኮል ሲጠቀሙ በአንድ ጊዜ ስንት ይጠጣሉ	በቁጥር _____ 77 አላውቀውም	
D18	ባለፉት 30 ቀናት አልኮል ሲጠቀሙ በአንድ ጊዜ ስንት ይጠጣሉ?	በቁጥር _____ 77 አላውቀውም	

D19	ባለፉት ቀናት አልኮል ሲጠቀሙ ምን ያህል ከምግብ ጋር ተጠቀሙ?	1. አብዛኛውን ጊዜ ከምግብ ጋር 2. አልፎ አልፎ ከምግብ ጋር 3. በጥቂቱ ከምግብ ጋር 4. ከምግብ ጋር አልጠቀምም
D20	ባለፉት ቀናት አልኮል ሲጠቀሙ በአንድ ጊዜ ስንት ይጠጣሉ?	በቁጥር _____ 77 አላውቀውም
D21	ባለፉት ቀናት አልኮል ሲጠቀሙ በቤት ውስጥ የተዘጋጁ ለምሳሌ ጠላ ጠጂ አረቁ ቦርደ ተጠቅመዋል?	1 አወን 0 የለም

3 ጫትን በተመለከተ		
D22	ጫት ቅመህ ሽ ታውቂያለህ ሽ	1 አወን 0 የለም የለም ከሆነ ወደ E1 ይሂዱ
D23	በአሁኑ ጊዜ ጫት ትቅመህ ሽ	1 አወን 0 የለም የለም ከሆነ ወደ E1 ይሂዱ
D24	ባለፉት ወራት፣ ጫትን ስትጥጠቀሙ በየስንት ጊዜ ወ. ነበር?	1. ቀንበቀን 2. 5-6 ቀን በሳምንት 3. 3-4 ቀን በሳምንት 4. 1-2 ቀን በሳምንት 5. 1-3 ቀን በወር 6. ከአንድ ጊዜ በታች በወር
D25	በአማካኝ በ ወር በሳምንት ስንት የታሰረ ጫት ይቅማሉ	የታሰረ ጫት ብዛት _____ 77 አላውቀውም
D26	በአሁኑ ጊዜ ጫት እየቃምክ ሽ ታጨሳለህ ሽ	1 አወን 0 የለም
D27	በባለፉት ወራት ጊዜ ጫት እየቃምክ ሽ ታጨሳለህ? ሽ 12	1 አወን 0. የለም
D28	በአሁኑ ጊዜ ጫት ከቃምክ ሽ በኋላ አልኮል ትጠጣላችሁ?	1 አወን 0 የለም

ክፍልE:			
ከዚህ ቀጥሎ የተለያዩ የአካል እንቅስቃሴ በማካሄድ የሚያሳልፉአቸውን ጊዜያት በተመለከተ እጠይቅዎታለሁ። ከስራ ጋር የተያያዙ አካላዊ እንቅስቃሴዎች			
E1	ባለፉት 7 ቀናት ብርቱ ጉልበት የሚይቁ አካላዊ እንቅስቃሴዎችን ለስንት ቀናት አደረጉ?	ለ _____ ቀናት 77 አላውቅም	ቢያንስ ለ10 ደቂቃ ስለሚያደርጉቸው አካላዊ እንቅስቃሴዎች እንዲያስቡ አግዝ ምሳሌ፡ ዜሮጠጠ ወይም አላውቅም ከሆነ ወደ "ጥያቄ E3" እለፍ/ፈ
E2	በነዚያ ቀናት ብርቱ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን በማድረግ ምን ያህል ጊዜ ያሳልፋሉ?	በቀን _____ ሰዓት በቀን _____ ደቂቃ አላውቅም _____ 77	አላውቅም ከሆነ ወደ "ጥያቄ E3" እለፍ/ፈ
E2-1	ባለፉት 7 ቀናት ብርቱ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን በማድረግ በድምሩ ምን ያህል ጊዜ አሳለፉ?	_____ ሰዓት በሰዓት _____ ደቂቃ በሰዓት 77 አላውቅም	
አሁን ባለፉት 7 ቀናት ውስጥ በነበሩት የሥራ ቀናት መጠናኛ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን በማለት ስላሳለፉት ጊዜ አስቡ. ቀላል ሸክም, ሞተር ሳይክል, የሜዳ ቴነስ. የእግር ጉዞን አይጨምርም.			
E3	ባለፉት 7 ቀናት መጠናኛ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን ለስንት ቀናት አደረጉ?	በሰዓት ለ _____ ቀናት 77 አላውቅም	ምሳሌ፡ ዜሮወይም አላውቅም ከሆነ ወደ ጥያቄ E 5" እለፍ/ፈ]
E4	በነዚያ ቀናት መጠናኛ ጉልበት የሚይጠቁ አካላዊ እንቅስቃሴዎችን በማድረግ ምን ያህል ጊዜ ያሳልፋሉ?	በቀን _____ ሰዓት በቀን _____ ደቂቃ 77 አላውቅም	ምሳሌ፡ ዜሮወይም አላውቅም ከሆነ ወደ "ጥያቄ E5" እለፍ/ፈ
E4-1	ባለፉት 7 ቀናት መጠናኛ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን በማድረግ በድምሩ ምን ያህል ጊዜ አሳለፉ?	_____ ሰዓት በሰዓት _____ ደቂቃ በሰዓት 77 አላውቅም	
አሁን ባለፉት 7 ቀናት በእግር ጉዞ ስላሳለፉት ጊዜ አስቡ። ይህ በሥራ፣ በቤት፣ በጉዞ፣ በመዝናኛ፣ በስፖርት ወይም በዕለታዊ ጊዜ የሚደረግ የእግር ጉዞን ያጠቃልላል።			
E5	ባለፉት 7 ቀናት በአንድ ጊዜ ቢያንስ የ10 ደቂቃ የእግር ጉዞ ለስንት ቀናት አደረጉ?	በሰዓት ለ _____ ቀናት 77 አላውቅም	ምሳሌ፡ ዜሮወይም አላውቅም ከሆነ ወደ "ጥያቄ E7" እለፍ/ፈ

E6	ከነዚያ ቀናት በአንዱ የእግር ጉዞ በማድረግ በአማካኝ ስላሳለፉት ጊዜ ለማወቅ ይፈለጋል። ጊዜ ከቀን ቀን በጣም የሚለያይ በመሆኑ ሳቢያ ለመመለስ ካልቻሉ ‘ባለፉት 7 ቀናት የእግር ጉዞ በማድረግ በድምሩ ምን ያህል ጊዜ አሳለፉ?’	___ ሰዓት በሰዓት ___ ደቂቃ በሰዓት 77 አላውቅም	ምላሹ ዜርወይም አላውቅም ከሆነ ወደ ጥያቄ E6-1 እለፍ/ፈ
E6-1	ባለፉት 7 ቀናት የእግር ጉዞ በማድረግ የሚይቁ አካላዊ እንቅስቃሴዎችን በማድረግ በድምሩ ምን ያህል ጊዜ አሳለፉ?	___ ሰዓት በሰዓት ___ ደቂቃ በሰዓት 77 አላውቅም	
አሁን ባለፉት 7 ቀናት ውስጥ በነበሩት የሥራ ቀናት ቁጭ በማለት ስላሳለፉት ጊዜ አስቡ። በቤት፣ በትምህርት፣ በዕረፍት ያሳለፉትን ጊዜ ያጠቃልላል። ይህ በዕውቀት ሥራ፣ ገደቶችን በመጎብኘት፣ በማንበብ፣ በመቀመጥ፣ በመተኛ ች ወይም ቴሌቪዥን በመመልከት ያሳለፉትን ጊዜ ያጠቃልላል ይቻላል።			
E7	ባለፉት 7 ቀናት ከነበሩት የሥራ ቀናት በአንዱ ምን ያህል ጊዜ ቁጭ በማለት አሳለፉ?	___ ሰዓት በሰዓት ___ ደቂቃ በሰዓት 77 አላውቅም	ምላሹ ዜርወይም አላውቅም ከሆነ ወደ ጥያቄ G እለፍ/ፈ
E8	ባለፈው ረቡዕ ቁጭ ብለው በድምሩ ምን ያህል ጊዜ አሳለፉ?	ረቡዕ ዕለት ለ _____ _ ሰዓት ረቡዕ ዕለት ለ _____ _ ደቂቃ 77 አላውቅም	

ክፍል F: አመጋገብን በተመለከተ፡ ባለፉት 12 ወራት ወደ ጊላ መለስ ብለው ሲያስቡ በየቀኑ ፣ ፣ በየሳምንቱ ወይም በየወሩ ምን ያህል በተደጋጋሚ እያንዳንዳቸውን ምግቦች እንደተመገቡ ንገሩን ።

ምግብ ዝርዝር	ድግግሞሽ	ምግብ ዝርዝር	ድግግሞሽ
F 1. ጤፍ	ምንም አልተመገቡም	F 2. ቦቆሎ	ምንም አልተመገቡም
	አንድ ጊዜና ከዚያ በታች በወር		አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ 1-2 ጊዜ በሳምንት		ከ 1-2 ጊዜ በሳምንት
	ከ 3-4 ጊዜ በሳምንት		ከ 3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ 2-3 ጊዜ በቀን		ከ 2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
6 ጊዜ እና ከዚያ በላይ በቀን	6 ጊዜ እና ከዚያ በላይ በቀን		

F 3. ገብስ	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር	F 4. ስንደ ና ዱቄት	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን

	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
	6 ጊዜ እና ከዚያ በላይ በቀን		6 ጊዜ እና ከዚያ በላይ በቀን
F5.ማሽላ/ዘንጋዳ	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር	F 6. ሩዝ	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
6 ጊዜ እና ከዚያ በላይ በቀን	6 ጊዜ እና ከዚያ በላይ በቀን		
F 7. የበሬ ስጋ	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር	F 8. የዶሮ ስጋ	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን

	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
	6 ጊዜ እና ከዚያ በላይ በቀን		6 ጊዜ እና ከዚያ በላይ በቀን
F 9. አሳ	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር	F 10. ጉብት	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን

	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
	6 ጊዜ እና ከዚያ በላይ በቀን		6 ጊዜ እና ከዚያ በላይ በቀን
F11.ፍየል/ግልገል	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር	F12 የታሸገ ስጋ	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
	6 ጊዜ እና ከዚያ በላይ በቀን		6 ጊዜ እና ከዚያ በላይ በቀን
F 13. ወተት	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር	F 14. አይብ	ምንም አልተመገቡም አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት

	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
	6 ጊዜ እና ከዚያ በላይ በቀን		6 ጊዜ እና ከዚያ በላይ በቀን
F 15. ቅቤ	ምንም አልተመገቡም	F 16. እንቁላል	ምንም አልተመገቡም
	አንድ ጊዜና ከዚያ በታች በወር		አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን

	6 ጊዜ እና ከዚያ በላይ በቀን		6 ጊዜ እና ከዚያ በላይ በቀን
F 17. ለወዝ	ምንም አልተመገቡም	F 18. ዘይት	ምንም አልተመገቡም
	አንድ ጊዜና ከዚያ በታች በወር		አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
	6 ጊዜ እና ከዚያ በላይ በቀን		6 ጊዜ እና ከዚያ በላይ በቀን

F 19.ባቄላ, አተር, ምስር, አኩሪ አተር	ምንም አልተመገቡም	F 20. ስኳር ድንች	ምንም አልተመገቡም
	አንድ ጊዜና ከዚያ በታች በወር		አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
6 ጊዜ እና ከዚያ በላይ በቀን	6 ጊዜ እና ከዚያ በላይ በቀን		
F 21.ድንች	ምንም አልተመገቡም	F 22. ከሮት	ምንም አልተመገቡም
	አንድ ጊዜና ከዚያ በታች በወር		አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
6 ጊዜ እና ከዚያ በላይ በቀን	6 ጊዜ እና ከዚያ በላይ በቀን		
F 23. ቲማቲም	ምንም አልተመገቡም	F 24. አበባ ጎመን	ምንም አልተመገቡም
	አንድ ጊዜና ከዚያ በታች በወር		አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
5-6 ጊዜ በሳምንት	5-6 ጊዜ በሳምንት		

	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
	6 ጊዜ እና ከዚያ በላይ በቀን		6 ጊዜ እና ከዚያ በላይ በቀን
F25.ቅጠል፣ አረንጓዴ አትክልት	ምንም አልተመገቡም	F 26. አሽካዳ	ምንም አልተመገቡም
	አንድ ጊዜና ከዚያ በታች በወር		አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
	6 ጊዜ እና ከዚያ በላይ በቀን		6 ጊዜ እና ከዚያ በላይ በቀን
F 27. ፓፓያ	ምንም አልተመገቡም	F 28. ሙዝ	ምንም አልተመገቡም
	አንድ ጊዜና ከዚያ በታች በወር		አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት
	ከ3-4 ጊዜ በሳምንት		ከ3-4 ጊዜ በሳምንት
	5-6 ጊዜ በሳምንት		5-6 ጊዜ በሳምንት
	አንድ ጊዜ በቀን		አንድ ጊዜ በቀን
	ከ2-3 ጊዜ በቀን		ከ2-3 ጊዜ በቀን
	ከ 4-5 ጊዜ በቀን		ከ 4-5 ጊዜ በቀን
	6 ጊዜ እና ከዚያ በላይ በቀን		6 ጊዜ እና ከዚያ በላይ በቀን
	ምንም አልተመገቡም		ምንም አልተመገቡም
F 29. እናናስ	አንድ ጊዜና ከዚያ በታች በወር	F 30. ብርቱካን	አንድ ጊዜና ከዚያ በታች በወር
	ከ 2-3 ጊዜ በወር		ከ 2-3 ጊዜ በወር
	ከ1-2 ጊዜ በሳምንት		ከ1-2 ጊዜ በሳምንት

	<p>ከ3-4 ጊዜ በሳምንት</p> <p>5-6 ጊዜ በሳምንት</p> <p>አንድ ጊዜ በቀን</p> <p>ከ2-3 ጊዜ በቀን</p> <p>ከ 4-5 ጊዜ በቀን</p> <p>6 ጊዜ እና ከዚያ በላይ በቀን</p>		<p>ከ3-4 ጊዜ በሳምንት</p> <p>5-6 ጊዜ በሳምንት</p> <p>አንድ ጊዜ በቀን</p> <p>ከ2-3 ጊዜ በቀን</p> <p>ከ 4-5 ጊዜ በቀን</p> <p>6 ጊዜ እና ከዚያ በላይ በቀን</p>
F31.ቀይ ሽንኩረት	<p>ምንም አልተመገቡም</p> <p>አንድ ጊዜና ከዚያ በታች በወር</p> <p>ከ 2-3 ጊዜ በወር</p> <p>ከ1-2 ጊዜ በሳምንት</p> <p>ከ3-4 ጊዜ በሳምንት</p>	F32.ነጭ ሽንኩረት	<p>ምንም አልተመገቡም</p> <p>አንድ ጊዜና ከዚያ በታች በወር</p> <p>ከ 2-3 ጊዜ በወር</p> <p>ከ1-2 ጊዜ በሳምንት</p> <p>ከ3-4 ጊዜ በሳምንት</p>
	<p>5-6 ጊዜ በሳምንት</p> <p>አንድ ጊዜ በቀን</p> <p>ከ2-3 ጊዜ በቀን</p> <p>ከ 4-5 ጊዜ በቀን</p> <p>6 ጊዜ እና ከዚያ በላይ በቀን</p>		<p>5-6 ጊዜ በሳምንት</p> <p>አንድ ጊዜ በቀን</p> <p>ከ2-3 ጊዜ በቀን</p> <p>ከ 4-5 ጊዜ በቀን</p> <p>6 ጊዜ እና ከዚያ በላይ በቀን</p>
F 33. ዝንጂብል	<p>ምንም አልተመገቡም</p> <p>አንድ ጊዜና ከዚያ በታች በወር</p> <p>ከ 2-3 ጊዜ በወር</p> <p>ከ1-2 ጊዜ በሳምንት</p> <p>ከ3-4 ጊዜ በሳምንት</p> <p>5-6 ጊዜ በሳምንት</p> <p>አንድ ጊዜ በቀን</p> <p>ከ2-3 ጊዜ በቀን</p> <p>ከ 4-5 ጊዜ በቀን</p> <p>6 ጊዜ እና ከዚያ በላይ በቀን</p>	F 34. ቃሪያ	<p>ምንም አልተመገቡም</p> <p>አንድ ጊዜና ከዚያ በታች በወር</p> <p>ከ 2-3 ጊዜ በወር</p> <p>ከ1-2 ጊዜ በሳምንት</p> <p>ከ3-4 ጊዜ በሳምንት</p> <p>5-6 ጊዜ በሳምንት</p> <p>አንድ ጊዜ በቀን</p> <p>ከ2-3 ጊዜ በቀን</p> <p>ከ 4-5 ጊዜ በቀን</p> <p>6 ጊዜ እና ከዚያ በላይ በቀን</p>
	<p>ምንም አልተመገቡም</p> <p>አንድ ጊዜና ከዚያ በታች በወር</p>		<p>ምንም አልተመገቡም</p> <p>አንድ ጊዜና ከዚያ በታች በወር</p>

F 35. ቡና	F36.የአካባቢ መጠጥ	ከ 2-3 ጊዜ በወር
		ከ1-2 ጊዜ በሳምንት
		ከ3-4 ጊዜ በሳምንት
		5-6 ጊዜ በሳምንት
		አንድ ጊዜ በቀን
		ከ2-3 ጊዜ በቀን
		ከ 4-5 ጊዜ በቀን
		6 ጊዜ እና ከዚያ በላይ በቀን
F 38. ጨው	ምንም አልተመጠውም	
	አንድ ጊዜና ከዚያ በታች በወር	
	ከ 2-3 ጊዜ በወር	
	ከ1-2 ጊዜ በሳምንት	
	ከ3-4 ጊዜ በሳምንት	
	5-6 ጊዜ በሳምንት	
	አንድ ጊዜ በቀን	
	ከ2-3 ጊዜ በቀን	
ከ 4-5 ጊዜ በቀን		
6 ጊዜ እና ከዚያ በላይ በቀን		
F 39. ከቤት ውጭ መመገብ	F 40. ባለፉት 12 ወራት ምግብ ሳይመገቡ ይዘሉ/ያሳልፉ ነበር?	1 አወን
		0 የለም
	F40a. መልሰው አወን ከሆነ የቱንያዘልላሉ?	1. ቁርስ
		2. ምሳ
3 እራት		
F41. በቤትዎ ውስጥ ለምግብነት በመደበኛነት ብዙጊዜ ምን አይነት ዘይት ወይም ቅባት ነው ጥቅም ላይ የሚያውሉት?	የአትክልት ዘይት	
	2. የረጋ ዘይት	
	ቅቤ	
	4. ሸኖ ለጋ	

		5. ሌላ ካለ ይግለጹ _____)
1. ቁርስ _____ ቀናት		
2. ምሳ _____ ቀናት		
3 እራት _____ ቀናት		

ክፍል J: የ ደም ግፊት ና ስኳር በሽታ የጊላ ታሪክ ምርመራን በተመለከተ		
በመጀመሪያ ስለ ታካሚው የደም ግፊትን ታሪክ ጥያቄዎች እጠይቅዎታለሁ		
J1	በአሁን ጊዜ በሀኪምዎ ወይም በሌላ የጤና ባለሙያ የታዘዘውን የደም ግፊት ማንኛውንም ሕክምና ምክር ይቀበላሉ?	1 አዎን 0 የለም
J2	እርስዎ ከደም ግፊት ጋር የተያያዘ የቤተሰብ ታሪክ አለዎት? ወላጅ፣ ወንድም ደም ግፊት ያለበት አለ?	አዎን 0 የለም
የስኳር	በሽታን በተመለከተ	
J3	በአሁኑ ወቅት በሀኪምዎ ወይም በሌላ የጤና ባለሙያ የታዘዘውን ማንኛውንም የስኳር ሕክምና/ ምክር ይቀበላሉ?	1 አዎን 0 የለም
J4	እርስዎ ከስኳር ሕመም ጋር የተያያዘ የቤተሰብ ወላጅ ታሪክ አለዎት?	1 አዎን 0 የለም

ክፍል K: የአካል ልኬትን በተመለከተ፣ ቁመት፣ ክብደት፣ የወገብ ና የዳሌ ልኬት		
K1	ቁመት	___ (ሳሜ) ለ ልኬት 1 ___ (ሳሜ) ለ ልኬት 2
K2	ክብደት	___ ኪ.ግ ለ ልኬት 1 ___ ኪ.ግ ለ ልኬት 2
K3	የወገብ ልኬት	___ በሣንቲ ሜትር (ሣሜ) ልኬት 1 ___ በሣንቲ ሜትር (ሣሜ) ልኬት 2
K4	የዳሌ ልኬት	___ በሣንቲ ሜትር (ሣሜ) ልኬት 1 ___ በሣንቲ ሜትር (ሣሜ) ልኬት 2

ክፍል L: የደም ግፊትን በተመለከተ		
L1	የደም ግፊት ልኬት 1	ሲስቶሊክ ሚ.ሜ.ሜርኩሪ) _____ ዲያስቶሊክ (ሚ.ሜ.ሜርኩሪ) _____
L1-1	የደም ግፊት ልኬት 2	ሲስቶሊክ ሚ.ሜ.ሜርኩሪ) _____ ዲያስቶሊክ ሚ.ሜ.ሜርኩሪ _____

ክፍል M: ባዩ ሜዲካል ልኬትን በተመለከተ:

መጀመሪያ የደም ስኳር መጠን መለካት.		
M1	ባለፉት ጳዳታት ውስጥ ምግብ ፈሳሽ ለገር ወስደዋል ?	1 አዎን 0 የለም
M2	የደም ናሙና የተወሰደበት ሰዓት	ሰዓት _____
M3	ምግብ ከመበላተዎ በፊት የደም ስኳር መጠን	_____ ሚ. ሞል/ ሊትር _____ ሚ. ግ/ዲ.ሲ. ሊትር ፍቃደኝ አይደለሁም
M4	በአሁኑ ወቅት የደም ስኳርዎ በመጨመሩ ምክንያት በሀኪምዎ ወይም በሌሎች ጤና ባለሙያዎች ኢንሱሊን መርፌ ወይም ክኒን ታዘወሎት ይወስዳሉ?	አዎን 0 የለም
የደም ስብ መጠን ልኬት:		
M5	ቶታል ኮሌስትሮል	_____ ሚ.ሞል/ ሊትር _____ ሚ.ግ/ዲ.ሲ. ሊትር ፍቃደኝ አይደለሁም
M6	በአለፉት ሁለት ሳምንታት ውስጥ ስብ መጠንዎ በመጨመሩ ምክንያት በሀኪም ወይም በሌሎች ጤና ባለሙያዎች ክኒን ወይም መርፌ ታዘወሎት ታክመው ያወቃሉ?	1 አዎን 0 የለም
M7	ትራይ ግሊሰራይድ	_____ ሚ.ሞል/ ሊትር _____ ሚ.ግ ዲ.ሲ. ሊትር ፍቃደኝ አይደለሁም
M8	ኤች ዲ ኤል ኮሌስትሮል	_____ ሚ.ሞል/ ሊትር _____ ሚ.ግ/ዲ.ሲ. ሊትር ፍቃደኝ አይደለም

እናመሰግናለን!