OVERNUTRITION AND ASSOCIATED FACTORS AMONG HYPERTENSIVE PATIENTS ATTENDING AT JIMMA UNIVERSITY MEDICAL CENTER

BY: MEREHATSEDEKE FISSHA (BSc)

A THESIS TO BE SUBMITTED TO JIMMA UNIVERSITY, INSTITUTE OF HEALTH, FACULTY OF PUBLIC HEALTH, DEPARTMENT OF NUTRITION AND DIETETICS, IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF DEGREE OF MASTER OF SCIENCES (M.Sc.) IN NUTRITION

SEPTEMBER, 2022

JIMMA, ETHIOPIA

OVERNUTRITION AND ASSOCIATED FACTORS AMONG HYPERTENSIVE PATIENTS ATTENDING JIMMA UNIVERSITY MEDICAL CENTER

BY: MEREHATSEDEKE FISSHA (BSc.)

ADVISORS:

1. GETU GIZAW (B.Sc., M.Sc., Asst. Professor, PhD candidate)

2. YABSRA MELAKU (B.Sc., M.Sc.,PhD candidate)

SEPETEMBER, 2022

JIMMA, ETHIOPIA

ABSTRACT

Background: Overnutrition is an abnormal or excessive fat accumulation that may impair health. Hypertension is the most powerful, independent, preventable risk factor for death and disability from cardiovascular diseases. There is a statistically significant association between body mass index (BMI) ≥ 25 and hypertension. But there is limited evidence on the prevalence of overweight /obesity and the associated factors among hypertensive patients in Ethiopia.

Objectives: To determine the magnitude and associated factors of overnutrition among hypertensive patients attending Jimma University Medical Center.

Methods: a cross-sectional study was conducted among 292 hypertensive patients from June 23 to July 21 2022 GC in Jimma University Medical Center. Hypertensive patients who had been on follow-up were included using a consecutive sampling technique in the study. Data were collected using a structured questionnaire was entered into Epi Data version 3.1, and analyzed by SPSS version 25.Descriptive statistics were computed to describe the study population. Bivariate and multivariable logistic regression analysis was performed to identify the associated factors for overnutrition among hypertensive patients. Adjusted odds ratio (AOR) with a 95% confidence interval and p-value <0.05 was used to determine the level of significant association. **Results:** The magnitude of overnutrition was 44.5%.The study shows being female [AOR=2.74 95% CI 1.50-4.99], having high school education and above [AOR=2.79 95% CI .23-6.34] and having co-morbidity [AOR=1.93 95% CI 1.14-3.26] were significantly associated with overnutrition.

Conclusion: This study has disclosed the high magnitude of overnutrition among hypertensive patients. Sex of the participant, educational status, and co-morbidity were found to be significantly associated with overnutrition.

Keywords: overnutrition, hypertension, Jimma, Ethiopia.

ACKNOWLEDGMENT

First and foremost, I would like to thank my God for everything.

I would like to thank Jimma University's department of nutrition and dietetics for giving me an opportunity to work on this title which will provide valuable information about the topic

I am dearly obliged to my advisors, Mr. Getu Gizawand Mrs. Yabsra Melaku who guided me in doing this research and provided me with invaluable advice and helped me in difficult periods.

I am also grateful for Jimma university medical center internal medicine chronic illness clinic nurses and the data collectors.

I am really grateful to my family and friends for their support.

TABLE OF CONTENT

Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS ANDACRONYM

BMI	Body Mass Index
BP	Blood pressure
CHD	Coronary Heart Disease
CI	Confidence Intervals
CKD	Chronic Kidney Disease
CVD	Cardiovascular Disease
DBP	Diastolic Blood Pressure
DALYs	Disability adjusted life years
HTN	Hypertension
MetS	Metabolic Syndrome
OR	Odds Ratio
SBP	Systolic Blood Pressure
WC	Waist Circumference
LMICs	Low- and Middle-Income Countries
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

1.1. Background

Cardiovascular diseases (CVDs) are the leading cause of death globally. An estimated 17.9 million people died from CVDs in 2019, representing 32% of all global deaths. Of these deaths, 85% were due to heart attack and stroke. Over three quarters of CVD deaths take place in low- and middle-income countries(1).The pooled prevalence of cardiovascular disease (CVD) in Ethiopia is 5% and was higher in the patients who visited health institutions, 8% (2). CVDs are the leading cause of mortality in Ethiopia. These findings urge Ethiopia to consider CVDs as a priority public health problem. Hypertension is the leading cause of cardiovascular disease and premature death worldwide. In 2017 one of the leading risk factors for CVD in Ethiopia was, high blood pressure, (3).

Hypertension is the most powerful, independent, preventable risk factor for death and disability from cardiovascular diseases. It is also a leading risk factor for all-cause mortality and the largest contributor to global disability-adjusted life years (DALYs). Most of the increase occurred in low- and middle-income countries(4). High blood pressure is a major risk factor for heart disease. Studies indicate that there is a strong, linear, and significant association between systolic and diastolic BP and risk of CVD, CHD, and stroke(5). The etiological risk factors leading to the onset of CVDs are well recognized and include hypertension, diabetes, obesity, smoking and, lack of physical activity. the identification and careful prevention of the underlying risk factors can significantly reduce the global epidemic of CVDs(6).

There was little change in the overall rate of hypertension in the world from 1990 to 2019, but the burden has shifted from wealthy nations to low- and middle-income countries. The rate of hypertension has decreased in wealthy countries – which now typically have some of the lowest rates – but has increased in many low- or middle-income countries. Although the percent of people who have hypertension has changed little since 1990, the number of people with hypertension doubled to 1.28 billion. In 2019, over one billion people with hypertension (82% of all people with hypertension in the world) lived in low- and middle-income countries(7), this

increase is due mainly to a rise in hypertension risk factors, being overweight or obese is one of the hypertension risk factors in those populations(8).

Overweight /obesity is abnormal or excessive fat accumulation that may impair health. According to world health organization overweight is BMI greater than or equal to 25 and obesity BMI greater than or equal to 30. The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. Globally there has been an increased consumption of energy-dense foods high in fat and sugars and a decrease in physical activity(9).

Understanding the etiology of overweight and obesity requires understanding the complex ways in which positive energy balance can occur. Both energy intake and energy expenditure are influenced by genetic factors and many factors within the environment in which we live. Further, changes in energy expenditure can influence energy intake and vice versa. Because of this complexity, the development of obesity cannot be attributed simply to excessive energy intake or low energy expenditure. High energy intake leads to overweight and obesity only if it is not matched by high energy expenditure, and low energy expenditure leads to overnutrition only if it is not matched by low energy intake. For body weight to change, energy imbalance must occur. When intake is lower than expenditure, negative energy balance occurs, and body energy stores are reduced. When energy intake exceeds expenditure, positive energy balance occurs, and body energy stores are increased. Factors that affect the etiology of obesity must affect one or more components of energy balance. (10)

By 2030, the respective number of overweight and obese adults was projected to be 1.35 billion and 573 million individuals without adjusting for secular trends. If recent secular trends continue unabated, the absolute numbers were projected to total 2.16 billion overweight and 1.12 billion obese individuals(11). By 2030, it is predicted that 1 in 5 women and 1 in 7 men will be living with obesity (BMI $\geq$30kg/m^2), equating to over 1 billion people globally. This is of particular concern in LMICs, where the greatest number of people with obesity now lives, and where health systems and healthcare professionals are severely underprepared to effectively manage and treat obesity and its consequences. Furthermore, many LMICs face the consequences of the double burden of malnutrition(12). In studies published since 2015 the prevalence of overweight and obesity in Ethiopia is 22.55% and 6.90% respectively(13).

Excessive fat accumulation leads to Insulin resistance, salt retention, elevated sympathetic nervous system activity, renin-angiotensin-aldosterone activation, and altered vascular function which in turn leads to hypertension. losing weight lowers their blood pressure(14)

But the prevalence and associated factors of overweight / obesity among hypertensive patients has not yet been studied in Ethiopia. So, in this study we will try to fill this gap and provide baseline information for health care providers and for further studies in this area.

1.2. Statement of the Problem

Hypertension– or elevated blood pressure– is a serious medical condition that significantly increases the risks of heart, brain, kidney and other diseases. An estimated 1.28 billion adults aged 30-79 years worldwide have hypertension, most (two-thirds) living in low- and middle-income countries. An estimated 46% of adults with hypertension are unaware that they have the condition. Less than half of adults (42%) with hypertension are diagnosed and treated. Approximately 1 in 5 adults (21%) with hypertension have it under control. Hypertension is a major cause of premature death worldwide. One of the global targets for non-communicable diseases is to reduce the prevalence of hypertension by 33% between 2010 and 2030(15).

There is high prevalence of hypertension in African Region 46% of adults aged 25 and above(16)The pooled prevalence of hypertension in Ethiopia was 20.63%. The pooled meta-analysis showed that there is a statistically significant association between obesity, body mass index (BMI) ≥25, and hypertension, with the odds of 3.79 (17). The pooled prevalence of uncontrolled hypertension in Ethiopia was 48%(18). The prevalence of uncontrolled hypertension among hypertensive patients at follow up at Jimma University Medical Center. is 52.7 and one of the significant predictor was over-weight(19). Both the incidence and control of hypertension is associated with overweight and obesity(20).

Hypertension is a major cause of increased mortality, chronic kidney disease, and cardiovascular disease (CVD), including myocardial infarction, heart failure, and stroke. Increased body weight and obesity are major risk factors for and often occur with hypertension; thus, intentional weight-loss strategies represent ideal targets to reduce risk for chronic diseases and mortality in individuals with overweight /obesity and hypertension. Obesity accounts for much of the risk for primary hypertension through several mechanisms, including neuro-hormonal activation,

inflammation, and kidney dysfunction. As the prevalence of obesity continues to increase, hypertension and associated cardio-renal diseases will also increase unless more effective strategies to prevent and treat obesity are developed(21).

Worldwide obesity has nearly tripled since 1975. In 2016, more than 1.9 billion adults, 18 years and older, were over-weight. Of these over 650 million were obese, 39% of adults aged 18 years and over were overweight in 2016, and 13% were obese Most of the world's population live in countries where overweight and obesity kills more people than underweight(9).

Obesity is a disease impacting most body systems. It affects the heart, liver, kidneys, joints, and reproductive system. It leads to a range of non-communicable diseases (NCDs), such as type 2 diabetes cardiovascular disease, hypertension and stroke, various forms of cancer, as well as mental health issues. People with obesity are also three times more likely to be hospitalized for COVID-19(12).

The association of blood pressure with overweight /obesity both for incidence of hypertension and also for the control of hypertension after incidence is evident. Across- sectional study conducted in Saudi Arabia revealed that most of the HTN patients suffer from overweight and obesity that could contribute significantly to the incidence of HTN (20). A systematic review done in Ethiopia indicates that those who were overweight /obese (BMI) greater or equal to 25 kg/m2 were seven times more at risk for HTN. Other studies also claimed that obesity increases the risk of increased BP by four to five times compared to a normal BMI (22).A study done among hypertensive patients in JUMC show that the prevalence of uncontrolled hypertension was 52.7 and one of the significant predictor was over-weight(19). Weight loss is clearly associated with a decrease in blood pressure. As a major public health issue, the management of overweight is of the highest priority. Successful management of overweight can supply additional benefits in the reduction of blood pressure and the associated biomedical burden of risk for CVD and stroke(23).

In several studies conducted, the global and regional prevalence of overweight and obesity and its associated factors are well established. In Ethiopia many community-based and few institution-based studies were done on prevalence of overweight /obesity and its associated

factors. In studies published since 2015 the pooled prevalence of overweight and obesity in Ethiopia is 22.55% and 6.90% respectively (13).

However, there is limited evidence on the prevalence and predictors of overweight and obesity among hypertensive patients globally as well as regionally. As per the investigator's knowledge, no study has been done regarding the magnitude of overweight /obesity and its associated factors among hypertensive patients in Ethiopia, including the study area. Hence, this study tries to solve this gap and provide baseline for further study and help professionals and policy-makers in designing appropriate intervention strategies to solve this problem of overweight /obesity among hypertensive patients.

1.3. Significance of the Study

Assessing the magnitude of overweight /obesity and identification of its predictors helps in weight management among hypertensive patients, provides beneficial impacts in hypertension control and lowers cardiovascular risks among hypertensive patients, The result of this study will benefit Oromia health office and Ministry of Health to improve or strengthen strategies related to the prevention and management of Hypertension. It will help policy makers to implement alternative intervention strategies by integrating health education and promotion services with the advanced hypertension management practices. It will also add to the existing body of knowledge and will be used as baseline for further study.

CHAPTER 2: LITERATURE REVIEW

2.1. Magnitude and Consequences of Overnutrition

Worldwide obesity has nearly tripled since 1975. In 2016, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 650 million were obese, 39% of adults aged 18 years and over were overweight in 2016, and 13% were obese. Most of the world's population lives in countries where overweight and obesity kills more people than underweight.(9).

According to one systematic review of cross sectionals studies in 195 countries, in 2015, excess weight contributed to 4.0 million deaths and 120 million DALYs of all-cause DALY among adults globally. Nearly 39% of deaths and 36% of DALYs related to high BMI occurred in those with a BMI <30 kg/m2.Cardiovascular disease was the leading cause of deaths and DALYs related to high BMI, Diabetes was the second leading cause of BMI-related deaths in 2015. Chronic kidney disease and neoplasm each accounted for less than 10% of all BMI-related deaths in 2015.Globally, 39% of deaths and 37% of disability-adjusted life-years that were related to high BMI occurred among overweight people this study showed sufficient evidence supporting a causal relationship between high BMI and cancers of the esophagus, colon and rectum, liver, gallbladder and biliary tract, pancreas, breast, uterus, ovary, kidney, and thyroid,(24).

Both overweight and obesity (all grades) were associated with increased all-cause mortality. In the BMI range above 25 kg/m2, the relationship of BMI to mortality was strong and positive. Population-attributable fractions for all-cause mortality due to overweight or obesity were 19% in North America, 16% in Australia and New Zealand, and 14% in Europe, but only 5% in east Asia. A given increase in BMI is associated with a far greater absolute mortality increase in men than in women Above 25 kg/m2, BMI was strongly positively related to coronary heart disease, stroke, and respiratory disease mortality, and moderately positively related to cancer mortality(25).

Another systematic review study reveals that Cardiovascular disease, diabetes, and kidney diseases were among the leading causes of high-BMI-related death and DALYs In 2017, cardiovascular disease was the leading cause of high-BMI-related DALYs (992.4 [95% UI 649.7, 1,363.9] per 100,000 people; followed by diabetes and kidney diseases (496.7 [95% UI 347.2, 679.6] per 100,000 people) and neoplasm (133.4 [95% UI 76.5, 205.7] per 100,000

people); they together accounted for 89.3% of all high-BMI-related DALYs. Similar patterns were observed for deaths globally (26).

In Ethiopia systematic review and meta-analysis of 16 cross-sectional studies with 19, 527 study participants show that, the estimated pooled prevalence of overweight among adults in Ethiopia is19%, the estimated pooled prevalence of obesity was 5.4%. The prevalence of overweight was higher, 22.6% in studies published since 2015, 22.4% in studies conducted only in urban settings and 24.4% in studies with small sample size (≤384 participants). Similarly, the prevalence of obesity was 6.9% in studies published since 2015, 6.2% in studies conducted only in urban settings, 6.4% in institution-based settings and 9.6% in studies with small sample size(13).

2.2 Magnitude of overnutrition among hypertensive Patients

A study conducted among hypertensive patients attending tertiary healthcare facilities in Nigeria (27)indicated that the combined prevalence of overweight and obesity was found to be 72%. In the same country in a cross-sectional and retrospective institution based study among hypertensive patients in Ibadan Nigeria, the combined prevalence of overweight and obesity was 88.8 (28).

In Saudi Arabia a hospital-based study conducted among hypertensive patients, the combined prevalence of overweight and obesity was 96.6 %(20). A retrospective review of the Medical records of 3186 adult hypertensive and diabetic patients in 10 primary health care Centers in Riyadh indicated that the combined prevalence of overweight and obesity amongst hypertensive and diabetic adult patients was 81%(29).

In a study that purposed to assess the distribution of overweight and obesity in a sample of Spanish hypertensive patients the combined prevalence of overweight and obesity was 83.7% (30)..In China the combined prevalence of overweight and obesity among hypertensive patients aged 45-74 was 54%(31). In Sri Lanka the magnitude of overnutrition among hypertensive patients showed that 36% were overweight and 28% were obese (32)

2.3. Risk Factors for Overnutrition

2.3.1 **Socio-demographic Characteristics**

A cross sectional study that was conducted among federal ministry civil servants in Addis Ababa, indicated that those who were aged 45 years and above were more likely to be overweight/obesity as compared to those who were in age category of 18–24 years(33).Women aged 30-39 years are at increased risk of overweight /obesity compared to younger women(34).With reference to adults 18–24 years of age, the odds were three times higher among adults 45–64 years to be overweight and obese (35). Another study which focused on women in relation to overweight and obesity indicated that urban women in the age groups from 20-29 years were significantly more likely to have overweight and obesity compared to the youngest age group (15 to 19 years)(36).

A study in a rural Cameron indicated that being female was associated with higher odds of overweight and obesity(37). Being male was associated with overweight and obesity in a study that was done in Wolaita Sodo (38).In another Study in North Lebanon, male gender was found to be a risk factor for overweight and obesity (39).A cross-sectional study conducted in Hawassa Ethiopia revealed that women had 2.56 times increased odds of overweight /obesity(35).Another cross-sectional study conducted in Addis Ababa City showed that males were 90% less likely to be obese when compared to females(40). In the same study illiterate people were 94% less likely to be obese compared to those who were literate people and having secondary or tertiary education were associated with higher odds of overweight and obesity in a study in Hawassa city (35). Women with secondary and above education had higher odds of becoming overweight and obese (36).

A cross-sectional study in north east Ethiopia shows that those who had higher wealth status and were married were positively associated with overweight /obesity (41). Married women had a higher odd of becoming overweight and obese. The odds of being overweight and obese was significantly higher among women in the richest quintile (36). Being married and having secondary or tertiary education were associated with higher odds of overweight and obesity(37).Having higher values of the modernization index was associated with a higher BMI(42).

2.3.2 Dietary factors

In a cross-sectional study that was conducted in Wolaita Sodo found that salt intake in diet, meal frequency ,use of "Hayat" oil for food preparation were determinants of overweight and / obesity (38). In another cross-sectional study among adults in northeast Ethiopia the odds of being overweight or obese was higher among adults who had snack intake habit (41). In a community based cross-sectional study that was done in Hawassa city frequent consumption of sweets, meat and eggs were associated with overweight /obesity(35). In a study that was done in Mexico showed that having a higher consumption of a "prudent" dietary pattern (traditional dishes, fruits, vegetables and low fat dairy) was associated with lower BMI(42).

One systematic review and meta-analysis study that included 45 observational studies (36 cross-sectional studies and 9 cohort studies) revealed that low frequency of breakfast intake per week is associated with higher odds of overweight /obesity than with high frequency breakfast intake per week. This meta-analysis confirmed that skipping breakfast is associated with overweight /obesity, and skipping breakfast increases the risk of overweight /obesity(43). In a cross-sectional study conducted in north Lebanon skipping breakfast was associated with increased risk for generalized and central obesity(39).A study in China confirmed that greater red meat consumption is a risk facotor for overnutrtion (31)

2.3.3 Life style factors

The study among federal ministry civil servants in Addis Ababa, also found that ever alcohol consumption was associated with increased risk of overweight and obesity as compared to non-consumers(33). A community-based cross-sectional survey conducted in the city of Hawassa daily intake of alcohol was associated with overweight /obesity(35).

A cross sectional study in a rural health district in Cameroon showed that current smokers had lower oddsof overweight and obesity(37).A study in Kuwait indicated that having ahistory of smoking was related to greater odds of obesity/central obesity(44). Another study in China showed that Smoking increased the likelihood of being under-weight by 0.9 % and healthy weight by 5.3 %, while the likelihood of overweight and obesity decreased by 6.5 %, of which obesity reduced by 5.1 %. After correctingfor endogeneity, the results were consistent and stronger. Cigarette smoking increased the likelihood of beingunder-weight by 2.7 % and healthy

weight by 12.7 %, while it decreased the likelihood of overweight and obesity by 13 %, of which obesity reduced by 10 %(45).

2.3.4. Physical Exercise

A study among federal ministry civil servants show that Adult who did not practice ten minutes' walk per day, more likely to overweight and obesity as compared to the counter parts. Similarly, participants who did not involve physical activity (sport) were 2.42 times more likely to overweight and obesity ascompared to those who had physical activity(33)physical inactivity were the most significant independent risk factors associated withboth generalized and central obesity among adults in north Lebanon (39)., lower physical activity levels was found to be risk factor for overwieght and obesity among hypertensive patients in China(31)Having moderate or low physical activity wasalso significantly associated with overweight /obesity(35).A study conducted in Mexico revealed that performing avigorous physical exercise fora greater number of hours per week was associated with a lower BMI(42). In a study that was conducted in Kuwait Physical activity was associated with lower odds of obesity/central obesity(44).

2.3.5. Health Status

In a study conducted in Addis Ababa it was discovered that non- hypertensive individuals were 86% less likelyto be obese when compared to hypertensive(40). Elevated blood pressure, has higher odds of obesity (44).A study done among urban poor youth in Accra, Ghana indicates that BMI was positively related to systolic BP, and significantly associated with systolic BP compared to diastolic (46).In china higher hypertension grades and antihypertensive treatment were associated with overweight or obesity among hypertensive patients (31)It is evidendt that there is gap of knowlegde concerming the magnitude as well as pridictors of overweight and obesity among hypertensive patients in Ethiopia.

2.4Conceptual frame work

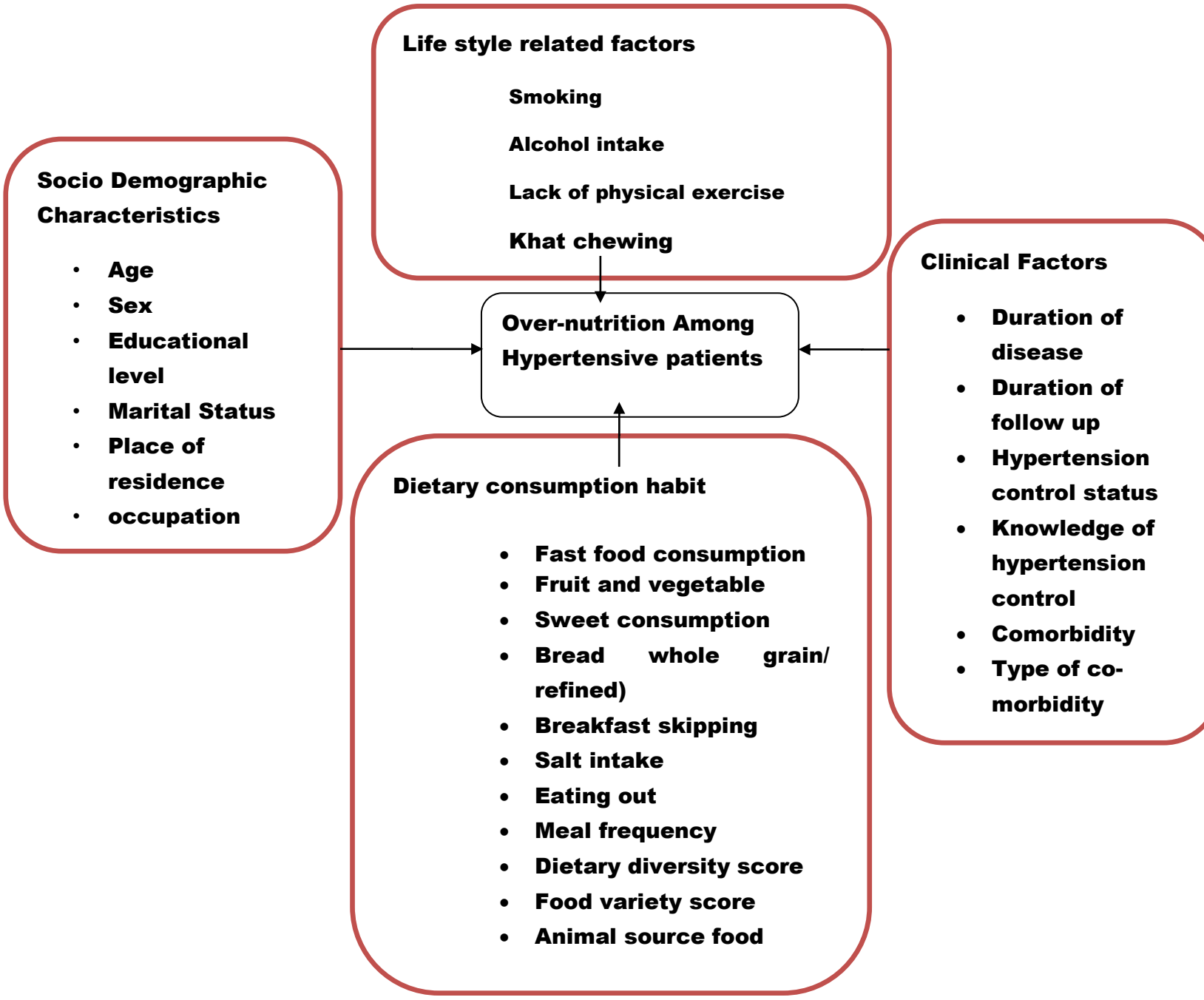

Figure 1Conceptual framework illustrating factors affecting Overnutrition among hypertensive patients, synthesized by investigator based on literature review, 2022

CHAPTER 3: OBJECTIVE OF THE STUDY

3.1. General Objective

To assess the magnitude and associated factors of overnutrition among hypertensive patients on follow up at Jimma University Medical Center, Jimma Southwest Ethiopia, from June23 to July 21 2022.

3.2. Specific Objectives

1. To determine the magnitude of overnutrition among hypertensive patients under follow-up at Jimma University Medical Center, Jimma Southwest Ethiopia, fromJune23 to July 21 2022.
2. To identify factors associated with overnutrition among hypertensive patients at follow up at Jimma University Medical Center, Jimma Southwest Ethiopia, from June23 to July 21 2022.

CHAPTER 4: METHODOLOGY OF THE STUDY

4.1. Study Area

Jimma University Medical Center (JUMC) is one of the oldest public hospitals in the country. It is geographically located in Jimma town, which is found 352 Kilometers southwest of Addis Ababa. It is a teaching and referral hospital providing services for approximately16, 000 in patient, 22,000 outpatient attendants, 12, 000 emergency cases and 4, 500 deliveries in a year to patients coming to the hospital from the catchment population of over 15 million people.

Hypertension follow up clinic is one of the chronic illnesses follow up clinic following a total of 5,161 patients coming from the catchment area (47).The prevalence of hypertension in south west Ethiopia was 13.2% (48) while the magnitude of central obesity among out patients at JUMC was 26% (49)

4.2. Study Design and Period

A hospital based cross sectional fromJune23 to July 21 2022.

4.3. Population

4.3.1. Source Population

All hypertensive patients aged 18 years and above attending Jimma University Medical Center hypertension follow up clinic.

4.3.2. Study Population

All hypertensive patients aged 18 years and above attending Jimma University Medical Center hypertension follow up clinic during the study period

4.4. Inclusion and Exclusion Criteria

4.4.1. Inclusion Criteria

Hypertensive patients18 years and above on follow up at least for six months

4.4.2. Exclusion Criteria

Critically ill and pregnant women were excluded from the study**.**

4.5. Sample Size and Sampling Technique

4.5.1. Sample Size Determination for objective one

The sample size is determined by Epinfo 7.25 using a single population proportion formula with a source population of 5162 hypertensive patients attending at JUMC with the following assumptions: prevalence of overweight / obesity among hypertensive patients in Nigeria attending tertiary health care facilities 72.5.%(27),5% margin of error and 95% confidence interval, the estimated sample size is 289.

4.5.2. Sample Size Determination for the second objective

Table 1 Sample Size Determination for the second objective

Variable	CI	POWER	Ratio	% Of outcomes non-exposed	AOR	Sample size	Reference
Marital status	95%	80	1	18.5	2.22	292	(41)
Sex	95%	80	1	17.39	2.56	216	(35)
Alcohol consumption	95%	80	1	19	2.27	272	(33)
Soft drink consumption	95%	80	1	45	2.0	290	(50)

Since the highest sample size is 292 for the second objective the final sample size is 292.

4.5.3. Sampling Technique

Consecutive sampling technique is used to include study participants who come to the clinic during the study period and fulfill the inclusion criteria.

4.6. Study Variables

4.6.1. Dependent Variable

Overnutrition

4.6.2. Independent Variables

1. Socio-demographic factors: (Age educational level marital status, current occupation, residence,family size)

2. Dietary factors
    a. vegetable consumption
    b. fruit consumption
    c. Fast food consumption
    d. Sweet consumption
    e. Sugar sweetened drinks
    f. Salt intake
    g. Bread intake (whole grain or refined)
    h. Breakfast skipping habit
    i. Meal frequency
    j. Dietary diversity score
    k. Food variety score
    l. Animal source food consumption

3. Behavioral
    a. Smoking
    b. Alcohol consumption
    c. Khat chewing
    d. Physical activity
4. Clinical factors
    a. Hypertension control status
    a. Duration of hypertension since diagnosed
    b. Duration of follow up
    c. Co-morbidity
    d. Type of comorbidity
    e. Knowledge of hypertension control

4.7. Data Collection Tool and Procedures

A structured interviewer-administered questionnaire adapted with minor modification from the WHO STEP(51) was used to collect data on socio-demographic characteristics, behavioral factors and dietary factors. Dietary patterns were also assessed using a validated food frequency questionnaire containing 30 food items that are commonly consumed in Jimma zone.

The questionnaire has six parts. The first part is the socio-demographic characteristics of the participants which include age, sex, occupation, educational status and monthly household income. The second part assesses the medical profile of the study participants such as family history of hypertension, duration of time passed since being diagnosed with hypertension, length of follow up, presence of hypertension related comorbidities. The third part assesses hypertension control knowledge, the fourth part assesses behavioral characteristics of the participants such as level of physical exercise, alcohol intake, smoking status and khat chewing habit and The fifth part assesses the dietary pattern of the participants. Thus, in atypical week the participants were asked about frequency of meal, breakfast skipping habits, the type of bread they usually consume, sweet, fast-food consumption and their salt intake status were assessed.

Anthropometric measurements

Seca digital weighing scale was used to measure weight of participants and was checked and adjusted at Zero level between each measurement, with participants standing without shoes and wearing light clothing. Weight was recorded to the nearest 100gram. Height was measured using a portable Stadiometer. Heights of subjects were measured to the nearest 0.5centimeters, with subjects standing in the upright position, and without wearing shoes. To ensure that an upright position is maintained, each subject was told to stand tall, looking straight forward, with the head of participants at the Frankfurt plane, knees straight and the heels buttocks and the shoulders blades touching the vertical surface of the stadiometer. BMI was computed by weight by dividing kilograms by height in meters squared (weight (kg)/ (height (m)2).

Khat chewing practice measurement

Khat chewing was measured as life time chewers those who chewed in their life time and those who chewed in the last 12 months and frequency of chewing in the last 12 months.

Tobacco use and alcohol consumption was

Tobacco and alcohol we reassessed according to WHO steps instrument (47

Physical activity

The level of physical activity was measured using WHO steps Questionnaire. The questionnaire collects information on the level of physical activity in three domains: (1) at work; (2) during transport; and 3) at leisure/recreational activity). Ultimately each individual was classified as physically active based on >=600 MET-min/week. Or physically inactive <600MET-min/(51)

Dietary assessment

Dietary diversity [DD] was assessed using a validated food frequency questionnaire containing 30 food items that are commonly consumed in Jimma zone(52). Participants were asked to report the frequency of consumption of each food per day, per week or per month using the past 1 month as a reference. Given the large variation of dietary habits in the local community over the days of the week, the consumption of each food item per day was not taken as a cut-off point to define consumers. The participants were coded as a ‘‘consumer’’ of a food item if they had consumed the food item at least once per week.

The 30 food items of the food frequency questionnaire were grouped into nine groups (starchy staples, dark green leafy vegetables, vitamin A rich fruit, vegetables and tubers, other fruits and vegetables, organ meat, meat and fish, eggs, legumes, nuts and seeds, milk and milk products) which was adapted from FAO(53).A Dietary Diversity Score (DDS) was constructed by counting the intake of the food groups over a period of one week based on the definition that it is the sum of food groups consumed over the reference period. For example, study participant who consumed one item from each of the food groups at least once during the week would have the maximum DDS of 9. The DDS was converted into tertiles and the highest tertile was used to define ‘‘high’’ dietary diversity score, while the two lower tertiles combined were labeled as ‘‘low’’ dietary diversity score. Food Variety Score [FVS] is the frequency of individual food items consumed in the reference period. It was calculated by counting the consumption of each of the 30 individual food items over the reference period of one week with the maximum FVS to be thirty. Animal Source Food [ASF] intake was assessed by summing the number of times each animal source food was consumed over the days of the week. Frequency of ASF consumption

was divided into tertiles and the highest tertile was used to define ‘‘high’’ frequency of consumption of ASF, while the two lower tertiles were labeled as ‘‘low’’ frequency of ASF consumption.

Fruit consumption was measured by adding the number of times each fruit food was consumed over the days of the week. Frequency of fruit consumption was divided into tertiles and the highest tertile was used to define ‘‘high’’ frequency of consumption of fruit, while the two lower tertiles were labeled as ‘‘low’’ frequency of fruit consumption. Vegetable consumption was measured by adding the number of times each Vegetable food was consumed over the days of the week. Frequency of Vegetable consumption was divided into tertiles and the highest tertile was used to define ‘‘high’’ frequency of consumption of Vegetable, while the two lower tertiles were labeled as ‘‘low’’ frequency of vegetable consumption

Knowledge about blood pressure control

Knowledge about blood pressure control was measured by eight interviewers administered questions and were computed by coding the correct responses as “1” and the incorrect ones as “0”. Then, the correct answers were added up and participants who scored the mean(4) and above were labeled as having good knowledge and those who scored below the mean were labeled as having poor knowledge (54).

Blood pressure measurement

Client’s chart was reviewed to retrieve the representative BP, which was the BP reading from the last three consecutive appointments including data collection day(19)

4.8.DataAnalysis

Data was cleaned, assessed for missing data and was entered using Epi-data version 3.1 and analyzed using SPSS for windows version 25. Descriptive analysis was undertaken and the result is presented by tables and graphs. Bivariate analyses were performed to assess the association of each independent variable with the outcome variable and to identify candidate variables for multivariable analysis. Before inclusion of candidate variables in the final model multi collinearity was checked using the cut-off point of Variance inflation (VIF) <10 and all of the candidate variables have VIF of less than two which is less than the settled cut off point. Candidate variables with p-value less than 0.25 in the bivariate analysis was entered to

multivariable logistic regression model to identify independent predictors .The magnitude of association between the different variables in relation to the outcome variable was measured by adjusted odds ratio (AOR) with 95% confidence interval (CI). The goodness of fit of the final logistic model was tested by using Hosmer-Lemeshow test at p- value of > 0.05 and Omnibus test at p-value < 0.05.A P-value less than 0.05 at 95% CI as cut of point was used to declare the observed association is statistically significant.

4.9. Data Quality Control

Quality of data was assured through the use of structured questionnaire, which was translated into Amharic and Afan-Oromo languages. One day training was given for data collectors before data collection regarding the objective of the study, interview techniques, anthropometric measurements, examination and ethical issue during data collection and overall activities for data collectors. The questionnaire was pretested on 5% of the sample size before 1 week before the actual data collection in order to assess its clarity, length, completeness and consistency and necessary modifications was made. The principal investigator was checking the data daily for completeness, accuracy and consistency. The instruments were standardized and checked about their functioning.

4.10. Operational Definitions

Overnutrition: BMI ≥**25**

Obese: a BMI greater than or equal to 30 kg/m2.

Over-weight: a BMI ≥25<30 kg/m2.(9)

Hypertension: a systolic or diastolic blood pressure (SBP/DBP) of ≥140/90 mmHg

Uncontrolled Hypertension: after three consecutive measurements were taken if an average systolic blood pressure of ≥140 mmHg or an average diastolic blood pressure of ≥90 mmHg(55).

4.11. Ethical Considerations

Ethical clearance was obtained from Institutional Review board of Jimma University, institute of health, A formal letter written by Institutional Review board of Jimma university was submitted to JUMC management prior to data collection, and permission was gained to carry out the study. Informed verbal consent was obtained from each participant. Questionnaires were coded to remove personal identifiers and information was kept confidentially. Assurance was given for participants to withdraw or not to participate in the study without any prejudice.

4.12. Dissemination Plan

The final report of this study will be presented, and a comprehensive report will be submitted to Jimma University, department of nutrition and dietetics. It is also planned to communicate the Finding to relevant and concerned/ responsible bodies. It will be ready for users at the health science library of Jimma University. Lastly, efforts will be made to publish the paper in an international journal.

CHAPTER 5: RESULTS

5.1. Socio-demographic Characteristics

A total of 292 study subjects aged 18 and above who came to Jimma University Medical Center internal medicine department for hypertension follow up were included in the study. The age of the participants ranged from 26 to 89 years, with a mean (standard deviation) age of 54 ±12 where, (43.8%) of them were aged 45-59 years and (38 %) were in the age group of 50 and above years, the rest 18.2% were <45 years. Majority of participants were urban dwellers (84.9%). Among the study participants, 80.1% of them were married and primary and below in education.

Table 2: Socio-demographic characteristics of participants JUMC, Jimma Southwest Ethiopia, June 2022- July 2022.

		Frequency	Percent
Sex (n=292)	Female	156	53.4
	Male	136	46.6
Age	18-29	6	2.1
	30-44	47	16.1
	45-59	128	43.8
	50-69	80	27.4
	70-89	31	10.6
Education	No formal education	81	27.7
	Primary school education	107	36.6
	Secondary and above	104	35.6
Marital status	currently married	234	80.1
	currently unmarried	58	19.9
Occupation	Unemployed	128	43.8
	Government employee	69	23.6
	Farmer	56	19.23
	Private job	39	13.4
Residence	Urban	248	84.9
	Rural	44	15.1
Income (N=118)	<1000	6	5.1

	1000–2250	45	38.1
	2251–3300	19	16.1
	≥ 3301	48	40.7

5.2. Respondents Medical History

From 282 respondents 29.1% had family history of hypertension. The mean ±SD of years since diagnosed with hypertension was 7.4 ± 6years. In addition, the participants reported that the mean duration of follow up was 6.4 ± 5.4years. About 97.3 % (284) of the participants have good knowledge on hypertension control. About50.7% (148) of the participants have controlled hypertension. Also, about39.7% (116) of participants had comorbidities. Diabetes was the most common co-morbidity accounting for 62.1%.

Table 3Respondents Medical history at hypertensive follow-up clinic JUMC, Jimma Southwest Ethiopia, June 2022- July 2022.

Medical History	Response	Frequency	Percent
Family history of hypertension (N=282)	Yes	82	29.1
	no	200	70.9
Diagnosis(N=292)	<5 Years	123	42.1
	5-10Years	105	36.0
	>10 Years	64	21.9
Follow up (N=292)	<5 Years	139	47.6
	5-10 Years	105	36.0
	>10 Years	48	16.4
Knowledge of hypertension control(N=292)	Poor knowledge	8	2.7
	Good knowledge	284	97.3
HTN control status(N=292)	Uncontrolled	144	49.3
	Controlled	148	50.7
Co-morbidity (N=292)	Yes	116	39.7
	No	176	60.3
Type of co-morbidity (N=116)	DM	72	62.1
	Cardiac	15	12.9
	Asthma	8	6.9

	Renal	6	5.1
	Others	15	12.9

5.3. Behavioral Characteristics

From 292 study participants 50.7 % (148) were life time khat chewer of whom 42.6 % (63) have chewed in the last 12 months, 36.5% (23) of them chew khat every day of the week while 39.7%(25) of them were chewing one to two days per week. Among the participants 1.4 % (4) were current smokers, of whom only two participants were smoking tobacco products daily. Among the study participants 5.8% (17) were past smokers and 2.7% (8) were passive smokers. Of the 292 participants 14% (41) of the participants reported they consumed alcohol during life time. Among those who confirmed of drinking alcohol in life time 58.5 % (24) had drank in the last 12 months at least one standard drinks. Among those whom 83.3% (20) had drank at least one standard drink in the past thirty days. Regarding physical exercise 58.2 % (170) were physically active.

Table 4: Behavioral and lifestyle characteristics of hypertensive patients on follow-up at JUMC, Jimma Southwest Ethiopia, June 2022- July 2022.

Behavioral and lifestyle characteristics		Frequency	Percent
Ever chewed chat(N=292)	Yes	148	50.7
	No	144	49.3
Chewed chat within the past	Yes	63	42.6
12 months (N=148)	No	85	57.4
Frequency of chewing in the	Daily	23	36.5
last 12 months (N=63)	Five to six days per we	5	7.9
	Three to four days per week	8	12.7
	One to two days per week	25	39.7
	One to three days per month	2	3.2
Currently smoking(N=282)	Yes	4	1.4
	No	288	98.6
Do you smoke daily(N=4)	Yes	2	50.0

	No	2	50.0
Past smoking (N=282)	Yes	17	5.8
	No	275	94.2
Passive smoking home(N=292)	Yes	8	2.7
	No	284	97.3
Passive smoking	Yes	8	2.7
workplace(N=292)	No	284	97.3
Ever consumed any	Yes	41	14.0
alcohol(N=292)	No	251	86.0
	Yes	24	58.5
Consumed any alcohol within the past 12 month(N=41)	No	17	41.5
Frequency(N=24)	One to seven days per week	12	50
	One to three days per month and below	12	50
Consumed within past 30	Yes	20	83.3
days(N=24)	No	4	16.7
	Total	24	100.0
During the past 30 days, on	1-4	13	72.2
how many occasions did you drink(N=18)	5-30	5	17.8
How many drinks during one	1-2	14	70
drinking occasion? (N=20)	3-4	6	30
Physical Activity	Physically inactive	122	41.8
status(N=292)	Physically active	170	58.2

5.4. Dietary Pattern

Nearly one third of the participants had high animal source food consumption, food variety score fruit consumption and dietary diversity score. We have assessed meal frequency, type of bread, eating out, skipping breakfast, fast food consumption, sweet consumption, salt intake, fruit consumption and vegetable consumption about 27% have high vegetable consumption. Regarding meal frequency majority of the participants (89%) eat three meals a day. The type of bread most of the participants (69.2%) usually consume refined non whole grain bread. Concerning the habit of eating out the vast majority of the participants (92.8%) usually consume food prepared at home and majority of them (89.7%) do not skip breakfast. In a typical week, about 96.2% of the participants do not consume fast food in a week and 97.9% of the participant do not eat sweet in a typical week. Among the participants 65.4% reported that they restricted salt in their diet.

Table 5: Dietary pattern among hypertensive patients on follow-up at JUMC, Jimma Southwest Ethiopia, June 2022- July 2022.

		Frequency	Percent
Animal source food consumption	High	95	32.5
	Low	197	67.5
Food variety score	High	108	37
	Low	184	63
	Total	292	100
DDS	High DDS	102	34.9
	Low DDS	190	65.1
Fruit consumption	High fruit consumption	98	33.6
	Low fruit consumption	194	66.4
Vegetable consumption	High vegetable consumption	79	27.1
	Low vegetable consumption	213	72.9
Meal frequency	Once	1	0.3
	Twice	24	8.2
	Three times	260	89
	Four times and above	7	2.4
Eating out	One to three days per week	10	3.4
	Four to seven days per week	4	1.4
	Don't remember	7	2.4
	Don't eat out	271	92.8
Skipping break fast	One to two days per week	15	5.1
	Three to seven days per week	5	1.7

	Don't remember	10	3.4
	Don't skip breakfast	262	89.7
Type of bread	Whole grain bread	24	8.2
	Refined flour bread	202	69.2
	I don't eat bread	39	13.4
	Whole grain and refined	27	9.2
Fast food consumption	One to two days per week	4	1.4
	Three to six days per week	3	1
	I don't remember	4	1.4
	I don't eat fast food	281	96.2
Sweet consumption per week	One to five days per week	2	0.7
	I do not eat sweets	286	97.9
	I don’t remember	4	1.4
Salt intake	Total avoidance of salt	60	20.5
	Limited intake of salt	191	65.4
	No limit salt	41	14
	Total	292	100

5.5. Overnutritional Status

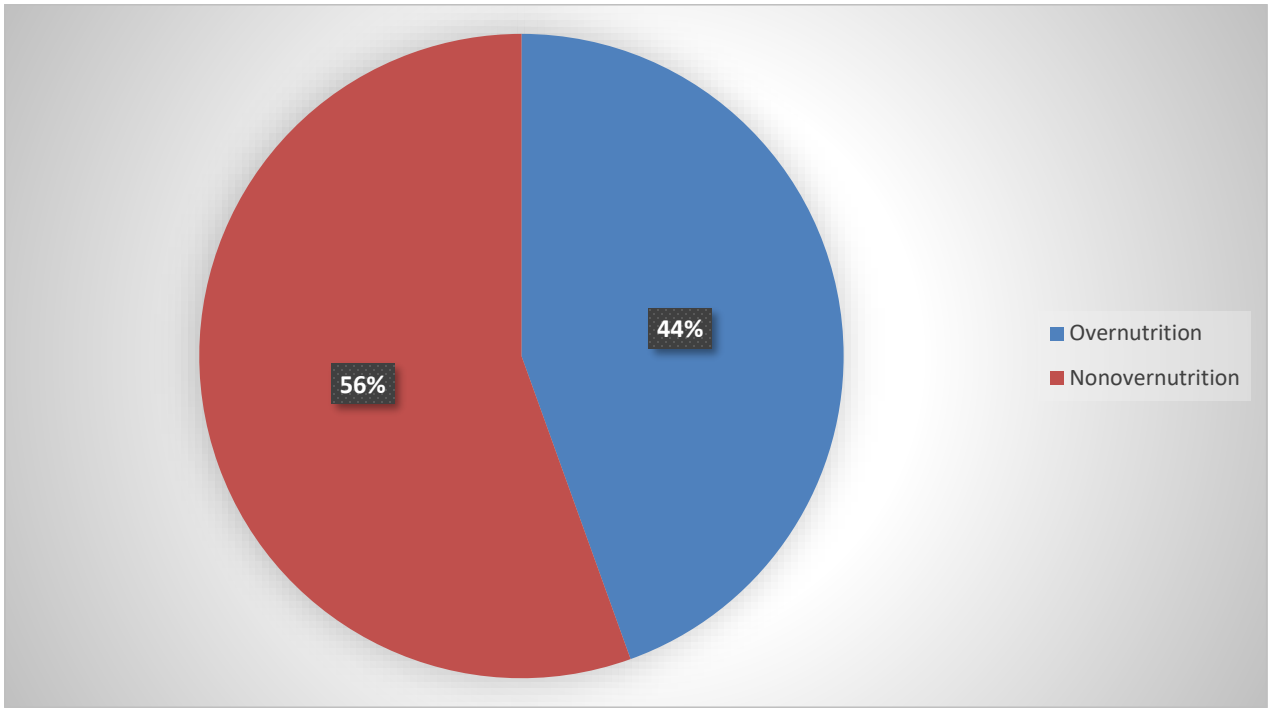

Figure 2: Overnutritional status of hypertensive patients under follow up at JUM

5.6. Bivariate and Multivariate Analysis

5.6.1. Factors Associated with overnutrition

Bivariate logistic regression analysis was conducted first to assess any association between individual independent variables there by to select candidate variable:age,sex,education,marital status ,residence, occupation ,comorbidity, type of co-morbidity hypertension control status,HTN follow up duration ,duration since diagnosed HTN,knowledge of hypertension control, physical activity, khat chewing ,alcohol consumption ,smoking habit, breakfast skipping ,eating out ,kind of bread fast food consumption, sweet consumption, fruit consumption ,vegetable consumption, salt intake ,Dietary diversity score ,food variety score, animal source food consumption score and magnitude of overnutrition. Variables having a p-value less than 0.25 in the bivariable logistic regression analysis were selected as a candidate variable to be included in multivariable logistic regression analysis. In bivariate analysis outcome, sex of the respondent, educational status, place of residence, type of occupation, marital status, having co-morbidity and dietary diversity score were associated with outcome variable.

Table 6: Bivariate analysis for factors associated with the magnitude of overnutrition at JUMC, Jimma Southwest Ethiopia, June 2022- July 2022.

Variables	Overnutrition		COR (95%CI)	P-value
	YES	NO		
Sex				
Male	42(30.9%)	94(69.1%)	1	
Female	88(56.4%)	68(43.6%)	2.90(1.79-4.69)	<0.001
Education				
No formal Education	31(38.3%)	50(61.7%)	1	
Primary school	44(41.1%)	63(58.9%)	1.13(0.62-2.03)	0.693
Secondary School and above	55(52.9%)	49(47.1%)	1.81(1.00-2.27	0.049
Marital status				
Currently married	97(41.5%)	137(58.5%)	1	
Currently not married	33(56.9%)	25(43.1%)	1.86(1.04-3.33)	0.036
Residence				
Rural	12(27.3%)	32(72.7%)	1	
Urban	118(47.6%)	130(52.4%)	2.42(1.19-4.92)	0.014
Occupation				
Unemployed	65(50.8%)	63(49.2%)	1	
Government employee	35(50.7%)	34(49.3%)	0.998(0.56-1.79)	0.994
Farmer	11(19.6%)	45(80.4%)	0.24(0.11-0.499)	<0.001
Private	19(48.7%)	20(51.3%)	0.92(0.45-1.89)	0.822
Comorbidity				
No	67(38.1)	109(61.9)	1	
Yes	63(54.3%)	53(45.7%)	1.93(1.20-3.11)	0.007
Dietary Diversity				

Score				
Low	87(40.3%)	129(59.7%)	1	
High	43(56.6%)	33(43.4%)	1.93(1.14-3.28)	0.015

After controlling the effect of confounding factors on multivariable analysis, sex of the participant, educational status and having co-morbidity were found to be significantly associated with magnitude of overnutrition at p-value <0.05.Accordingly women were 2.74 times more likely to have overnutrition compared to males (AOR=2.74 :95%CI: 1.50-4.99).Odds of having overnutrition among those who had secondary school and above education were 2.79 times likely to have overnutrition compared with to those who had no formal educational (AOR=2.79 : 95%CI:1.23-6.34.) hypertensive patients who have co-morbidity were 1.9 3timesas likely to have overnutrition compared to those without co-morbidity (AOR=1.9 :95%CI:1.14-3.26).

Table 7: Multivariable logistic regression analysis showing factors associated with overnutrition among hypertensive patients who are on follow up at JUMC, Jimma Southwest Ethiopia, June 2022- July 2022.

Variables		Overnutrition		COR(95%CI)	AOR (95%CI)	P-value
		Yes	No			
Sex	Male	42(30.9%)	94(69.1%)		1	
	Female	88(56.4%)	68(43.6%)	2.90 (1.79-4.69)	2.74(1.50-4.99)	**0.001**
Education	No formal Education	31(38.3%)	50(61.7%)		1	
	Primary school	44(41.1%)	63(58.9%)		1.62(0.79-3.30)	0.181
	Secondary School and above	55(52.9%)	49(47.1%)	1.81(1.00-2.27)	2.79(1.23-6.36)	**0.014**

Marital status	Currently married	97(41.5%)	137(58.5%		1	
	Currently not married	33(56.9%)	25(43.1%)	1.86(1.04-3.33)	1.41(0.72-2.78)	0.321
Residence	Rural	12(27.3%)	32(72.7%)		1	
	Urban	118(47.6 %)	130(52.4%	2.42(1.19-4.92)	0.89(0.35-2.22)	0.783
Occupation	Unemployed	65(50.8%)	63(49.2%)		1	
	Government employee	35(50.7%)	34(49.3%)		0.90(0.45-1.81)	0.777
	Farmer	11(19.6%)	45(80.4%)	0.24(0.11-0.499)	0.44(0.18-1.11)	0.083
	Private	19(48.7%)	20(51.3%)		0.95(0.43-2.12)	0.896
Comorbidity	No	67(38.1)	109(61.9)		1	
	Yes	63(54.3%)	53(45.7%)	1.93(1.20-3.11)	1.93(1.14-3.26)	**0.014**
DDS	Low	87(40.3%)	129(59.7%		1	
	High	43(56.6%)	33(43.4%)	1.93(1.14-3.28)	1.74(0.98-3.08)	0.059

CHAPTER 6: DISCUSSION

This study demonstrated that the overall magnitude of overnutrition95% CI [38.7%-50.4%] among hypertensive patients who are at follow up at JUMC was found to be 44.5% of which 29.8% were overweight and 14.7% were obese respectively. The finding of this study is consistent with community-based studies. In northwest Ethiopia the prevalence of overweight was 32.4% while the prevalence of obesity was 16.2% (56).In Kerman, Iran prevalence of overweight and obesity was 43.0%(57). But our finding is different with other studies. Study conducted in Saudi among hypertensive patients the combined prevalence of overweight and obesity was 96.6% , 75.4%,21.2% were overweight and obese respectively(20).In a study conducted among hypertensive patients attending tertiary healthcare facilities in Nigeria (27) combined prevalence of overweight and obesity was found to be 72%.In China the combined prevalence of overweight and obesity among hypertensive patients aged 45-74 was 54%(31). In Sri Lanka the magnitude of overnutrition among hypertensive patients was 64%(32). The possible reasons for such difference might be due to differences in residence, life style, socio-economic, genetic factor, population.

In this study females were more likely to be overweight / obese as compared to males. The finding is consistent with the study done in northwest Ethiopia (58). In Addis Ababa City a community-based cross-sectional study revealed that males were 90% less likely to be obese when compared to females (40).Another study conducted in Hawasa city women had 2.56 times increased odds of overweight /obesity(35). A study in a rural of Cameron indicate that being female was associated with higher odds of overnutrition(37).Also similar finding has been reported in north India (59)Such findings have been reported from elsewhere as well and fits in with the global trend (3)

The observed difference of overweight/obesity between the two genders can be due to both biological and social factors. In developing countries males are more frequently engage in physically demanding activities than women do, hence they may have reduced risk of obesity. Further, studies suggested that female sex hormones have a great impact on deposition of fat, females can carry more amount of fat as compared to males and hence risk of obesity(60).

However Being male was associated with overnutrition in a study that was done in Wolaita Sodo town (38).In another Study in North Lebanon, male gender was found to be a risk factor for overnutrition(39). These disparities may be due to socio-demographic differences.

Furthermore, we found that having completed higher levels of education such as secondary or tertiary education compared to no formal or primary education were associated with higher odds of being overweight or obese even though one would expect educated people to be more informed and prone to adopting healthy lifestyles this finding is consistent with the study done in Addis Ababa city in which illiterate individuals were 94% less likely to be obese compared to those who were literate(40). Having secondary or tertiary education were associated with higher odds of overnutrition in a study done in Hawassa city (40). Similar findings were noted in Botswana (61). In developing countries Individuals with higher levels of education are more likely to acquire non-manual jobs which require lesser energy expenditure compared with their counterparts with lower levels of education, who are more likely to resort to manual jobs. In addition, those with higher levels of education, who acquire skilled jobs are more likely to receive better pay checks and therefore spend more money on processed foods despite the relatively lower physical activity, thereby aggravating the burden of overweight and obesity. However, our findings differ from some studies, conducted in developed countries whereby having a low education was instead associated with being overweight or obese(62).

The reason for the difference could be that in high-income countries highly educated individuals eat healthier diets while low educational level is connected to diets high in carbohydrates ,sweets red meats , low in fiber but high educational level is linked to a greater consumption of fruits, vegetables, and fish,(63)and higher education is related with physically active life style(64) may be due to increased health literacy and having better financial and emotional support .

The magnitude of overweight /obesity was significantly higher among those patients with co-morbidity especially with Diabetes. This is in line with other studies (65). Hypertension is strongly associated with obesity in diabetics, hypertension diabetes co-morbidity is more associated with body fat than diabetes and hypertension alone (66). Having diabetes and diabetes-related cardiovascular (CVD) comorbidities increases with Body Mass Index (54).

This relation could be justified as obesity is associated with both the occurrence of hypertension and diabetes(67)those who have comorbidity of hypertension and diabetes might have more probability to have more overweight and obesity.

CHAPTER 7: CONCLUSION AND RECOMMENDATION

7.1.Conclusion

This study has shown high prevalence of overnutrition which is risk factor for uncontrolled hypertension and other cardio vascular diseases among hypertensive patients. Being female, having high school educational level and above and co-morbidity increase the risk of overweight and obesity significantly.

7.2. Recommendation

Based on the finding of the current study, the following recommendations were forwarded.

To ministry of health

- In its hypertension prevention and control effort focus should be given to the high prevalence of overnutrition and special attention should be given to hypertensive patients who are women, with comorbidity and with educational level of high School and above.

To Jimma zone health office

- To incorporate BMI measurement as part of the follow up routine for hypertensive patients with special attention for females, those with comorbidity and with educational level of high Scholl and above.
- Implement screening of overweight and obesity
- **To medical practitioners**
- To incorporate screening and management of overnutrition in their care for hypertension patients with special attention for females, those with comorbidity and with educational level of high Scholl and above.

To study subjects

- To have regularly check their body mass index in order to maintain healthy weight.

To Researchers

- Researchers should do further study in deferent locations, assess the nutritional status of hypertensive patients with more accurate fat percentage measuring instruments, identify variables that are predictors of overnutrition among hypertensive patients

Limitation of the Study

The temporal link between the outcome and explanatory variables could not be established because of the cross-sectional study design. Blood pressure measurement was taken from chart by taking an average of three successive follow-up blood pressure measures which has its own limitation. Social desirability might also have influenced the results. Because the study participants' behavior was relied on self-reports, there could be recall bias.

REFERENCE

1. World Health Organisation (WHO). Cardiovascular diseases. 2014;127(June):6–7.

2. Angaw DA, Ali R, Tadele A, Shumet S. The prevalence of cardiovascular disease in Ethiopia: a systematic review and meta-analysis of institutional and community-based studies. BMC Cardiovasc Disord [Internet]. 2021;21(1):1–9. Available from: https://doi.org/10.1186/s12872-020-01828-z

3. Ali S, Misganaw A, Worku A, Destaw Z, Negash L, Bekele A, et al. The burden of cardiovascular diseases in Ethiopia from 1990 to 2017: Evidence from the Global Burden of Disease Study. Int Health. 2021;13(4):318–26.

4. Mensah GA. Epidemiology and global burden of hypertension. In Oxford, UK: Oxford University Press; 2018. Available from: https://oxfordmedicine.com/view/10.1093/med/9780198784906.001.0001/med-9780198784906-chapter-61

5. Gu D, Kelly TN, Wu X, Chen J, Duan X, Huang JF, et al. Blood pressure and risk of cardiovascular disease in chinese men and women. Am J Hypertens. 2008;21(3):265–72.

6. Flora GD, Nayak MK. A Brief Review of Cardiovascular Diseases, Associated Risk Factors and Current Treatment Regimes. Curr Pharm Des. 2019;25(38):4063–84.

7. Risk NCD, Collaboration F. Articles Worldwide trends in hypertension prevalence and

progress in treatment and control from 1990 to 2019 : a pooled analysis of 1201 population-representative studies with 104 million participants. 2021;398.

8. World Health Organitation. Hypertension 25. 2022;(August 2021):1–4.

9. WHO. Obesity and overweight. 2020;

10. Ross C. Modern Nutrition in He [Internet]. Vol. 40, Angewandte Chemie International Edition. 2001. 9823 p. Available from: http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:No+title#0%5Cnhttp://doi.wiley.com/10.1002/1521-3773%2820010316%2940%3A6%3C9823%3A%3AAID-ANIE9823%3E3.3.CO%3B2-C

11. Kelly T, Yang W, Chen CS, Reynolds K, He J. Global burden of obesity in 2005 and projections to 2030. Int J Obes. 2008;32(9):1431–7.

12. Ranking NOP. World Obesity Atlas 2022. 2022;(March).

13. Kassie AM, Abate BB, Kassaw MW. Prevalence of overweight / obesity among the adult population in Ethiopia : a analysis systematic review and meta- -. 2020;1–10.

14. Kotchen TA. Obesity-Related Hypertension : Epidemiology , Pathophysiology , and Clinical Management. Am J Hypertens [Internet]. 2009;23(11):1170–8. Available from: http://dx.doi.org/10.1038/ajh.2010.172

15. (WHO) WHO. Hypertension 25. World Heal Organ [Internet]. 2022;(August):2022. Available from: https://www.who.int/news-room/fact-sheets/detail/hypertension

16. Haldar RN. Global Brief on Hypertension: Silent Killer, Global Public Health Crisis. Indian J Phys Med Rehabil. 2013;24(1):2–2.

17. Tesfa E, Demeke D. Prevalence of and risk factors for hypertension in Ethiopia: A systematic review and meta-analysis. Vol. 4, Health Science Reports. 2021.

18. Amare F, Hagos B, Sisay M, Molla B. Uncontrolled hypertension in Ethiopia: A systematic review and meta-analysis of institution-based observational studies. BMC Cardiovasc Disord. 2020;20(1):1–9.

19. Tesfaye B, Haile D, Lake B, Belachew T, Tesfaye T, Abera H. Uncontrolled hypertension and associated factors among adult hypertensive patients on follow-up at Jimma University Teaching and Specialized Hospital: cross-sectional study. Res Reports Clin Cardiol. 2017;Volume 8:21–9.

20. AlMarri E, Al-Hamad J. Prevalence of obesity among hypertensive patients in Primary Care Clinic, Security Forces Hospital, Riyadh, Saudi Arabia 2017–2018: A prospective cross-sectional study. J Fam Med Prim Care. 2020;9(4):1885.

21. Hall ME, Cohen JB, Ard JD, Egan BM, Hall JE, Lavie CJ, et al. Weight-Loss Strategies for Prevention and Treatment of Hypertension: A Scientific Statement from the American Heart Association. Hypertension. 2021;(November):E38–50.

22. Legese N, Tadiwos Y. Epidemiology of hypertension in ethiopia: A systematic review. Integr Blood Press Control. 2020;13:135–43.

23. Harsha DW, Bray GA. Weight loss and blood pressure control (Pro). Hypertension. 2008;51(6):1420–5.

24. Health Effects of Overweight and Obesity in 195 Countries over 25 Years. N Engl J Med. 2017;377(1):13–27.

25. Table S, Lowering P, Comparing T, Intervention A, Cad MI. Body-mass index and all-

cause mortality. 2015;6736(15):1–24.

26. Dai H, Alsalhe TA, Chalghaf N, Riccò M, Bragazzi NL, Wu J. The global burden of disease attributable to high body mass index in 195 countries and territories, 1990–2017: An analysis of the Global Burden of Disease Study. PLoS Med. 2020;17(7):1–19.

27. Deji SA, Olayiwola IO, Fadupin GT. Assessment of nutritional status of a group of hypertensive patients attending tertiary healthcare facilities in Nigeria. East Afr Med J. 2014;91(3):99–104.

28. Length F. PREVALENCE OF OBESITY AND HIGH LEVEL OF CHOLESTEROL IN HYPERTENSION. 2003;6(January 1998):2001–4.

29. Memish ZA, Bcheraoui C El, Tuffaha M, Robinson M, Daoud F, Jaber S, et al. Obesity and Associated Factors — Kingdom of Saudi Arabia , 2013. 2014;1–10.

30. Cosín Aguilar J, Hernándiz Martínez A, Masramón Morell X, Arístegui Urrestarazu R, Aguilar Llopis A, Zamorano Gómez JL, et al. [Overweight and obesity in hypertensive Spanish patients. The CORONARIA study]. Med Clin (Barc). 2007 Nov;129(17):641–5.

31. Qin X, Zhang Y, Cai Y, He M, Sun L, Fu J, et al. Prevalence of obesity, abdominal obesity and associated factors in hypertensive adults aged 45-75 years. Clin Nutr [Internet]. 2013;32(3):361–7. Available from: http://dx.doi.org/10.1016/j.clnu.2012.08.005

32. Mayurathan P. PREVALENCE OF OVERWEIGHT , OBESITY AND HYPOTHYROIDISM AMONG COLOMBO , SRI LANKA GARI International Journal of Multidisciplinary Research. 2021;(September 2020).

33. Bogale KA, Zewale TA. Determinant factors of overweight / obesity among federal

ministry civil servants in Addis Ababa , Ethiopia : a call for sector - wise occupational health program. BMC Res Notes [Internet]. 2019;1–6. Available from: https://doi.org/10.1186/s13104-019-4489-4

34. Tebekaw Y. Rising Overweight-Obesity and Its Socio-Demographic Correlates in Addis The Rising Overweight-obesity and Its Socio-Demographic Correlates in Addis Ababa , Ethiopia , 2000-2011. 2013;(November 2014):2000–11.

35. Darebo T, Mesfin A, Gebremedhin S. Prevalence and factors associated with overweight and obesity among adults in Hawassa city , southern Ethiopia : a community based cross-sectional study. 2019;1–10.

36. Ahmed KY, Abrha S, Page A, Arora A, Shiferaw S, Tadese F. Trends and determinants of underweight and overweight / obesity among urban Ethiopian women from 2000 to 2016. 2020;1–13.

37. Simo LP, Agbor VN, Temgoua FZ, Fozeu LCF, Bonghaseh DT, Mbonda AGN, et al. Prevalence and factors associated with overweight and obesity in selected health areas in a rural health district in Cameroon: a cross-sectional analysis. BMC Public Health. 2021;21(1):1–12.

38. Tadesse M. Determinants of obesity among working adults in Wolaita Sodo town , Determinants of Obesity among Working Adults in Wolaita Sodo. 2019;(April).

39. El-kassas G, Ziade F. Exploration of the Risk Factors of Generalized and Central Obesity among Adolescents in North Lebanon. 2017;2017.

40. Hailemariam TW, Ethiopia SS, Alamdo AG, Hailu HE. Emerging nutritional problem of adult population: Overweight/obesity and associated factors in Addis Ababa city communities, Ethiopia-a community-based cross-sectional study. J Obes. 2020;2020.

41. Gelaw YA. Factors associated with overweight and obesity among adults in northeast Ethiopia : a cross - sectional study. 2019;391–9.

42. Serna-Gutiérrez A, Castro-Juarez AA, Romero-Martínez M, Alemán-Mateo H, Díaz-Zavala RG, Quihui-Cota L, et al. Prevalence of overweight, obesity and central obesity and factors associated with BMI in indigenous yaqui people: a probabilistic cross-sectional survey. BMC Public Health [Internet]. 2022;22(1):1–11. Available from: https://doi.org/10.1186/s12889-022-12702-2

43. Ma X, Chen Q, Pu Y, Guo M, Jiang Z, Huang W, et al. Skipping breakfast is associated with overweight and obesity: A systematic review and meta-analysis. Obes Res Clin Pract [Internet]. 2020;14(1):1–8. Available from: https://doi.org/10.1016/j.orcp.2019.12.002

44. Oguoma VM, Coffee NT, Alsharrah S, Abu-Farha M, Al-Refaei FH, Al-Mulla F, et al. Prevalence of overweight and obesity, and associations with socio-demographic factors in Kuwait. BMC Public Health. 2021;21(1):1–13.

45. Wang Q. Smoking and body weight: Evidence from China health and nutrition survey. BMC Public Health [Internet]. 2015;15(1):1–8. Available from: http://dx.doi.org/10.1186/s12889-015-2549-9

46. Afrifa-Anane E, Agyemang C, Codjoe SNA, Ogedegbe G, De-Graft Aikins A. The association of physical activity, body mass index and the blood pressure levels among urban poor youth in Accra, Ghana. BMC Public Health. 2015;15(1):1–9.

47. Story O. Jimma University Medical Center (JUMC). Luca Incrocci Found [Internet]. 2018;8–11. Available from: https://www.lucaincroccifoundation.org/JUMC

48. Kebede Gudina E, Michael Y, Assegid S. Prevalence of hypertension and its risk factors in southwest Ethiopia: A hospital-based cross-sectional survey. Integr Blood Press

Control. 2013;6(February 2015):111–7.

49. Press D. Metabolic syndrome and associated factors among outpatients of Jimma University Teaching Hospital. 2016;47–53.

50. Ayza A, Tadesse E, Handiso YH. Prevalence of overweight / obesity and associated factors among adults in Wolaita Sodo Town , Southern Ethiopia Prevalence of overweight / obesity and associated factors among adults in Wolaita Sodo Town ,. Cogent Med [Internet]. 2021;8(1). Available from: https://doi.org/10.1080/2331205X.2021.1965709

51. Luis F, Moncayo G. WHO STEPS SERVEILLANCE MANUAL.

52. Belachew T, Lindstrom D, Gebremariam A, Hogan D, Lachat C, Huybregts L, et al. Food Insecurity, Food Based Coping Strategies and Suboptimal Dietary Practices of Adolescents in Jimma Zone Southwest Ethiopia. PLoS One. 2013;8(3).

53. FAO. Guidelines for measuring household and individual dietary diversity. Fao. 2010. 1–60 p.

54. Kassa Mekonnen C, Yimer Mekonnen B, Sewunet Mekonnen H. Knowledge and associated factors of blood pressure control among hypertensive patients attending chronic illness follow-up clinic at university of gondar, comprehensive specialized hospital, Northwest, Ethiopia. Vasc Health Risk Manag. 2019;15:551–8.

55. James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, et al. 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults: Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). JAMA [Internet]. 2014 Feb 5;311(5):507–20. Available from: https://doi.org/10.1001/jama.2013.284427

56. Moges B, Amare B, Fantahun B, Kassu A. High prevalence of overweight , obesity , and hypertension with increased risk to cardiovascular disorders among adults in northwest Ethiopia : a cross sectional study. 2014;1–10.

57. Najafipour H, Yousefzadeh G, Forood A, Karamouzian M, Shadkam M, Mirzazadeh A. Overweight and obesity prevalence and its predictors in a general population: A community-based study in Kerman, Iran (kerman coronary artery diseases risk factors studies). ARYA Atheroscler. 2016;12(1):17–27.

58. Mekonnen T, Animaw W, Seyum Y. Overweight / obesity among adults in North-Western Ethiopia : a community-based cross sectional study. 2018;1–6.

59. Rengma MS, Sen J, Mondal N. Socio-Economic, Demographic and Lifestyle Determinants of Overweight and Obesity among Adults of Northeast India. Ethiop J Health Sci. 2015;25(3):199–208.

60. Law J, Bloor I, Budge H, Symonds ME. The influence of sex steroids on adipose tissue growth and function. Horm Mol Biol Clin Investig. 2014 Jul;19(1):13–24.

61. Letamo G. The prevalence of, and factors associated with, overweight and obesity in Botswana. J Biosoc Sci. 2011 Jan;43(1):75–84.

62. Witkam R, Gwinnutt JM, Humphreys J, Gandrup J, Cooper R, Verstappen SMM. Do associations between education and obesity vary depending on the measure of obesity used? A systematic literature review and meta-analysis. SSM - Popul Heal [Internet]. 2021;15(April):100884. Available from: https://doi.org/10.1016/j.ssmph.2021.100884

63. Azizi Fard N, De Francisci Morales G, Mejova Y, Schifanella R. On the interplay between educational attainment and nutrition: a spatially-aware perspective. EPJ Data Sci [Internet]. 2021;10(1). Available from: http://dx.doi.org/10.1140/epjds/s13688-021-

00273-y

64. Kari JT, Viinikainen J, Böckerman P, Tammelin TH, Pitkänen N, Lehtimäki T, et al. Education leads to a more physically active lifestyle: Evidence based on Mendelian randomization. Scand J Med Sci Sport. 2020;30(7):1194–204.

65. Abdissa D, Dukessa A, Babusha A. Prevalence and associated factors of overweight/obesity among type2 diabetic outpatients in Southwest Ethiopia. Heliyon [Internet]. 2021;7(2):e06339. Available from: https://doi.org/10.1016/j.heliyon.2021.e06339

66. Saleem Z, Saeed H, Khan ZA, Khan MIH, Hashmi FK, Islam M, et al. Association of hypertension and dyslipidaemia with increasing obesity in patients with type 2 diabetes mellitus. Brazilian J Pharm Sci. 2019;55:1–9.

67. Patel SA, Ali MK, Alam D, Yan LL, Levitt NS, Bernabe-Ortiz A, et al. Obesity and its relation with diabetes and hypertension: a cross- sectional study across four low- and middle-income country regions. Glob Hear. 2016;11(1):71–9.

Annex I Questionnaire

Annex I: English version questionnaire

1. Information Sheet

How are you? I am_____. I am here on the behalf of MerehatsedekeFissha, student of JimmaUniversityInstitute of Health, department of nutrition and dietetics, who is conducting research obtaining permission from the University The aim of the study is to toknow the magnitude of overnutrition and associated factors among hypertensive patients attending Jimma University Medical Center.Therefore, this study will have a great contribution in the control and prevention of obesity among hypertensive patients. Besides, I believe this study was provide baseline information toattract governmental, non-governmental organizations and stakeholders to play their role tocontrolthese problems.

You are selected to participate in thisstudy. Your participation is voluntary and you are not obligated to answer any question whichyou do not wish to answer. If you feel discomfort with the interview, please feel free to drop any time you want. Your name was not be written in this form and no one will have access tothe non-coded data except the principal investigator. All information you provide was keptstrictly confidential. it was never be used for other purpose it is not intended for. The findings of the study are general for the study community and will not reflect anything particularly of individual persons. The questionnaire is coded to excludeshowing names. No reference is made in oral or written reports that could link participants to theresearch.

During the study, you will be interviewed about your personal characteristics, dietary information, eating habit, health related behaviors, physical activity.
Your height, weight and waist circumference was also be measured. The interview will take about 30 minutes. Remember, your willingness and active participation is very important for the success of this study. The risk of participating in this study is almost none, but only taking 30minutes from your time. There would not be direct payment for participating in this study.

Participation for this study is fully voluntary. You have the right to declare to participateor not in this study. If you decide to participate, you have the right to withdraw from the study atany time and this is not labeling you for any loss of benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

If you want to know more information about theresearch and its undertakings, you can contact the principal investigator through the followingaddress:

Name of the principal investigator: MerehatsedekeFissha

Email: mereye2009@gmail.com Mobile: 0912006069
Informed Consent Form

Based on the understanding of the information provided, are you willing to participate in this study?
(A) Yes… (1) ..... If "Yes", proceed to the questionnaire
(B) No.… (2) ..... If "No", skip to next participant

Questioner ID ---------- Date ----------Data collector's name ----------

Blood pressure and anthropometric measurement		
1	Blood pressure	Current_____2nd _____3rd _____
2	BMI	1.Height _____ meter 2. weight _____kg
3	Waist circumference	_____ cm
Socio demographic		
1	Age(in number)	1._____years 2. I do not know
2	Gender	Mal Female----------
3	Education	1.No formal education-2. Primary school education (Grade 3.Second school education (Grade) 4.College degree and above
4	Marital Status	1 Married. 2 Single /Never married. 3.Widowed 4. Separated 5. Div
5	What is your family's average monthly or yearly income	1.monthly _____Birr 2.yearly_____. Birr
6	Permanent place of residence	1. Jimma -2. Outside of Jimma (urban)-3. Outside of Jimma (Rural)
7	Number of household members	----------
8	Occupation / Employment Status	1.House wife 2. Gov't Employed 3.Non-gov't Employee 4. Mercha 5.Daily laborer 6. pensioned 7..Unemployed 8. farmer 9.self employe Other specify ---
Health status profile		
1	How long have you been diagnosed with Hypertension (in ye	|___|___| years
2	Stage of hypertension	1.stage one ……..2. stage two……..
3	Length of follow up	|___|___| years
4	What co-morbidities do you currently have?	1.Diabetes…2. 3.asthma …03.cardiac 4.Renal diseases 5.Others …..
5	Do you have a family history of Hypertension?	1.yes 2. No--------
Hypertension control knowledge		
1	Which of the following methods are used to control blood pressure?	1.Diet control 2. Drug therapy 3. Regular exercise 4. Diet, drug & regu exercise 5. Don't know
2	What is the nutritional therapy of hypertension?	1. Water restriction 2. Decrease salt intake 3. Increase salt intake 4.Decrease calorie reach foods 5. Don't know
3	Which of the following food should a hypertensive patient avo	1.Salt reach and salty foods 2. Spicy foods 3.Fatty foods 4.Vegetables know
4	How much salt is given to hypertensive patient/day?	_____gm
5	What form of exercise is good for blood pressure control?	1.Aerobics (walking, jogging) 2. Weight bearing 3.Driving 4.Dancing know
6	At what time hypertensive medications should be taken?	1.Under stress situation.2.As life long way to manage high blood press 3.When activities require 4.physical exertion.5.Whenever a patent feel bad.6.Don't know
7	How does hypertensive patient take medications?	1.As per information got from other hypertensive patents 2.As per information got from books and journals.3.Taking medications prescribed for the disease lor ago 4.Taking the medications which are currently prescribed by the doctor don't know
8	How often should a hypertensive patient rest?	1.Complete bed rest. 2. Rest after doing all the work.3. Rest in betwee activities.(3) 4.No need to exercise. 5.Don't know
	Khat use	
1	Have you **ever chewed chat**	1. yes 2. No if no go to go to tobacco section

	How long have you been chewing	_
2	Have you chewed chat within the past 12months	1. yes 2. No if no go to go to tobacco section
3	If yes how often	1.Daily 2. Five to six days per wee3. Three to four days per week 4.on two days per week 5.one to three days per month 6.Less than once a m
6	How many Zurbas/"esire"ononeof those days?	_____
Tobacco use		
1	Do you currently smoke any tobacco such as cigarettes, ci shisha or pipes, Gaya?	1. yes 2. No if no go to Q 5
2	Do you currently smoke tobacco products daily?	1. yes 2. No
3	How old were you when you first started smoking?	1 Age 2.dont't know
4	On average, how many of the following products do you smok day/week?	DAILY↓ WEEKLY↓ Manufactured --------- ---------- Pipes ---------- ---------- Hand-rolled ---------- ---------- Number of Shisha sessions ---------- ----------
5	In the past, did you ever smoke any tobacco products? *(includ shisha*	1. yes 2. No if no go to Alcohol section
6	In the past, did you ever smoke daily?	1. yes *If Q1=Yes, go to alcohol section , else go to next* 2. No *If Q1=Yes, go to alcohol section , else go to next*
7	How old were you when you stopped smoking?	1. 1.-----years old 2. Years ago
8	During the past 30 days, did someone smoke in your home?	1. yes 2. No
9	During the past 30 days, did someone smoke in closed areas ir workplace (in the building, in a work area or a specific office)?	1. yes 2. No I don't work in a closed area
	Alcohol Consumption	
1	Have you ever consumed any alcohol such as beer wine, tag, tele areke	1. yes 2. No if no go to physical activity section
2	Have you consumed any alcohol within the past 12months	1. yes 2. No if no go to physical activity section
3	During the past 12 months, **how frequently** have you had at le bottles/glasses/birile drink?	1.Daily 2. Five to six days per wee3. Three to four days per week 4.on two days per week 5.one to three days per month 6.Less than once a month 7. N
4	Have you consumed any alcohol within the past 30 days?	1. yes 2. No if no go to physical activity section
5	During the past 30 days, on how many occasions did you have least one bottles/glasses /birli alcoholic drink?	1. Number -----2. Don't know 3. If zero go to
6	During the past 30 days, when you drank alcohol, how many sbottles/glasses/birli drinks on average did you have during on drinking occasion?	1.Number -----2. Don't know
	Physical Activity	
	Activity in the Work type foratleast 10 min continously 1.vigorous ,2.moderate 3. Non	1.Number of days in typical week____2.per day_____Hours_____minutes_____
8	In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?	1.Number of days in typical week _____2.per day - Hours_____.minutes_____
9	How much time do you spend walking or bicycling for travel typical day?	1.Hours--------2.minutes-------
1	sports, fitness or recreation for atlest 10 min continiuslt1.vigor ,2.moderate 3. Non	1.Number of days in typical week-_____2.per day - .Hours____minutes_____
1	How much time do you usually spend sitting or reclining on a day?	1.Hours--------2.minutes-------
	Dietary practice Questions	
1	In a typical week Typical meal frequency per day	1.Onece 2. Twice 3. Three times 4. Four times and above

2	In a typical week Consumption of meal away from home per v	1.days/times------- 2. I do not remember 3. I do not eat out
3	In a typical week, how often do you eat snack	1.days/times------- 2. I do not remember 3. I do not eat
4	In a typical week, how often do you skip breakfast	1.days/times------- 2. I do not remember 3. I do no skip
5	In a typical week, what kind of bread do you eat	1.Whole grain bread, 2. White bread-3.I do not eat bread-------
6	What type of oil do you use for cooking	1.liquid 2. Solid 3.animal fat .butter
7	Which oil do you use Multiple Answer Possible	1.Olive oil 2. Sunflower oil—3.Nigger seed oil-4. Flax seed oil-5.Soy oil 6.Coconut oil /Peanut oil -7.Palm oil-8.Butter or ghee 9.Animal fat ---
8	In a typical week, how often do you eat Fast foods (e.g. cheeps, burger, pizza, deep fried foods	1.days/times------- 2. I do not remember 3. I do not eat
9	In a typical week, how often do you eat Sweets (e.g. sweets. Biscuits, cookies, cakes, chocolate bar)	1.days/times------- 2. I do not remember 3. I do not eat
1	How is your salt intake?	1.Total avoidance of salt in my diet 2.Limited intake of salt-3.no limit

In the past 30 days or in the past one month have you ever eaten ----if yes how often				
	1.Teff	Per day __.per week__ month_____	2.Maize	Per day __.per week____per month_____---
	3.Barley	Per day __.per week__ month_____	4.Wheat,including bread	Per day __.per week____per month_____---
	5.Sorghum/millet	Per day __.per week__ month_____---	6.Rice	Per day __.per week____per month_____---
	7.Beef	Per day __.per week__ month_____---	8.Pork	Per day __.per week____per month_____---
	9.Fish	Per day __.per week_ month_____---	10 .Chicken	Per day __.per week____per month_____---
	11.Goat/Lamb	Per day __.per week__ month_____	12.Liver	Per day __.per week____per month_____
	13.Milk	Per day __.per week__ month_____	14.Chees	Per day __.per week____pe month_____---
	15.Butter	Per day __.per week__ month_____--	16.Eggs	Per day __.per week____pe month_____---
	17.Nuts	Per day __.per week_ month_____-	18.Oil	Per day __.per week____pe month_____---
	19.Beans,peas,lentils	Per day __.per week_ month_____---	20.Sweet potatoes	Per day __.per week____pe month_____---
	21.Potatoes	Per day __.per week_ month_____---	22.Carrot	Per day __.per week____pe month_____---
	23.Tomato	Per day __.per week_ month_____---	24.Cauliflower	Per day __.per week____per month_____---
	25.Leafy green vegetables	Per day __.per week_ month_____	26.Avocado	Per day __.per week____pe month_____---
	27.Papaya	Per day __.per week_ month_____---	28.Bananas	Per day __.per week____pe month_____---
	29.Pineapple	Per day __.per week_ month_____---	30.Oranges	Per day __.per week____pe month_____---
	31.Coffee	Per day __.per week_ month_____---	32.Soft drinks	Per day __.per week____pe month_____---

Annex II: AfanOrmo version questionnaire

Gaaffii

Gaaffiiafaanoromootiinqopha'ee

Unkaodeeffannoo

Akkamjirtu? Ani maqaankoo ----------jedhama. Ani kananbakkabu'eedhufeMerehatsedekeFisshabarataaunibarsitiijimmaamuummeesooratanamaabarnootaisaabarataakanjirufcharraqorannoogeggessuufunibarsitiijimmaairraaayyamakanargateedha. Kayyoonqorannooisaasnamootadhiibbaadhiigaaqabaatanii mana yaalaaunibarsitiijimmaattihordooffiigochaajiranirrattihammagitadarbaasooratee fi wantootabaayyeesoorachuuwajjinhariirooqabanbaruudha. Kanaafqorannoonkunhirmaannaaguddaadhibee kana to'achuufittisuukeessattigochuudand'aa. Akkasumasodeeffannoohawwataadhabbatamootummaa, miti-mootumma fi himmaattotabiraafbu'uuratahuudanda'aankennuunrakkoo kana to'achuufnigargaara.

Isin mala siistemaanfilatamuusampalitokkoncarraaqorannoo kana keessaattihirmaachuuargattaniittu. Hirmaannankeessanisfedhiidhaanmaleedirqamagaffiikamiyyuuyooisinittihintolleedeebisuudhiisuuqabdu. Yoogaaffiinisingaafatamtanisinittihintolleadaraagidduuttikuttaniibahuufduubattihindeebi'inaa!

Maqaakeessanwaraqaagaaffii kana irrattihinkatabamuabbaaqorannookanaanalattinamnitookkoiyyuuodeeffannookoodiihinqabne kana argachuuhindanda'u.
odeeffannooisinnuuflaattanhundiyyuuofittiamanamuummaantahuuqaba.
Odeeffannoonkeessaniswaantabiraaqorannookanaanalattiwaantokkoofiyyuuhinoolu.
Bu'aanqorannookanaashawwaasaafmaleenamadhuunfaatokkokancalaqqisiisumiti.
Waraqaangaaffiikunismaqaadhiisuudhaankoodiiqoftiittilaatama. Afaniinistahee, barreffamaanqaamahirmaate/tterageeffachuunhindanda'amu.

Yerooqorannookanaattiskangafatamtanwa'eeamaladhuunfaa, odeeffannoosoorata, haalasooratаa, amalootafayyaawajjiinhaliirooqabaniifiishaakalaqaamaaisinqabdanta'a. akkasumahojjaan (dheerinni), ulfaatinni fi bal'innimudhiikeessaniinisafarama. Gaffiinkunnaannoodaqiiqaa 30 isinfudhata. Yaadadhaa, fedhiifhirmaannaankeessanqorannoo kana milkeessuufiddooguddaaqaba.
Miidhaanqorannookanattihirmaachuukeessaniinisinirragahudaqiiqaa 30 isinnuufjettaniigubdaniialattihinjiru. Baasiinqaamahimraatekanaafkennamutokkoshinjiru.

Hirmaannaanqorannookanaaftahusfedhiiguutuudhaan. Mirgaqorannoo kana keessattihirmaachuufdhabuukeessaniisibsachuudandeesssu.
Yoohirmaachuufmurteesssitanisergajalqabdaniiboodayooisinittihintolleyeroobarbaaddanittigidduuttikutta niibahuufmirgaguutuuqabdu. Kana waangootaniifbu'aanisindarbutokkolleehinjiru.
Gaaffiideebisuuhinbarbaannesdeebisuuhinqabdan.

Odeeffannoo gadi fagoowaa'eeqorannookanaafakkataaadeemsaisaairrattiyoobarbaaddan, abba qorannookanaakaraateessooarmaangadiiquunnammuudandeesssu.
Maqaaabbaaqorannookanaa**MerehatsedekeFisshajedhama**

Email: mereye2009@gmail.com , Mobile: 0912006069

Unkawaliigalteefqophaa'e

Odeeffannoohubannoofkennnameirrattihundaa'uudhaa, hirmaataa/ttuuqorannookanaatahuuffedhiiqabduu?

A) Eeyyee……..yoo "eyyyee" gaaffiiittifufi

B) Lakki ……. Yoo ”lakki” hirmataa/ttubiraattidarbi

Safartuudhiibbaadhiigaa fi anthropometric

1 Dhiibbaadhiigaa Ammaa_____1ffaa_____2ffaa_____ .

2 BMI 1.Dheerinnimeetira _____2. ulfaatina_____kg 3 Naannoomudhii _____ cm

Hawaasummaadimogiraafii

1 Umurii(lakkoofsaan) 1._____waggaa 2. Hinbeeku

2 Saala Mal Dubartii----------

3 Barnoota1.Barnootaidileehin qabu-2. Barnootasadarkaatokkoffaa(Kutaa 3.Barnoota sadarkaalammaffaa (Kutaa) 4.Digirii kolleejjii fi isaaol

4 HaalaGaa’ilaa 1 Fuudhaa fi heerumaa. 2 Qeenxee /Takkaafuudheehinbeekne. 3.Haadha abbaanmanaairraadu’e 4. Gargarba’e 5. Hiikaaba’e

5 Galiimaatiikeetiiji’aji’aanyknwaggaattigiddugaleessaanmaali1.ji’atti__Birr 2.waggaatti_____. Birrii

6 Bakkajireenyaadhaabbataa 1. Jimmaa -2. Jimmaan ala (magaalaa)-3. Jimmaan ala (Baadiyyaa) .

7 Baay'inamiseensotamaatii---------- .

8 Hojii / HaalaHojii1.Haadhamanaa 2. Gov’t Hojjete3.Hojjetaamootummaahintaane 4. Daldalaa5.Hojjetaa guyyaaguyyaa 6. soorama7..Hojii hinqabne 8. qonnaanbulaa9.of hojjete10 Other specify --- .

Profaayiliihaalafayyaa

1 DhiibbaaDhiigaa(Hypertension) qabaachuunkeeyerooyoomiitti adda baafame (waggootakeessatti) |___|___| waggoota

2 Sadarkaadhiibbaadhiigaa1.sadarkaatokko .....2. marsaalammaffaa.....

3 Dheerinnihordoffii |___|___| waggoota

4 Yerooammaadhukkubootawaliindhufanakkamiiqabdu? 1.Dhukkuba Sukkaaraa...2. 3.asmii ...03.onnee4.Dhukkubakalee 5.Kanneen biroo .....

5 SeenaamaatiikeessaniiDhiibbaaDhiigaaqabduu? 1.eeyyee 2. Lakki------

Beekumsato'annoodhiibbaadhiigaa

1 Kanneenarmaangadiikeessaakam

mala dhiibbaadhiigaato’achuufittifayyadamaa? 1.Nyaata to'achuu 2. Wal'aansa qoricha3. Sochiiqaamaayeroohunda gochuu4. Nyaata, qoricha&sochiiqaamaayeroohunda5. Hinbeeku

2 Yaaliinsoorataadhiibbaadhiigaamaali? 1. Bishaandaangessuu 2. Soogiddafudhachuuhir’isuu3. Soogiddafudhachuudabaluu 4.Nyaata kalooriigahuhir'isuu5. Hinbeeku

3 Dhukkubsataandhiibbaadhiigaaqabunyaataarmaangadiikeessaa isa kamirraafagaachuuqaba? 1.Soogidda dhaqqabuu fi nyaatasoogiddaqabu 2. Nyaatami'aawaa3.Nyaatacoomaqabu 4.Kuduraa 5.Hin beeku

4 Dhukkubsataa/guyyaadhiibbaadhiibbaadhiigaaqabuufsoogiddameeqakennama? _____gm jedhamuunbeekama

5 Sochiiqaamaagosaakkamiidhiibbaadhiigaato’achuufgaariidha? 1.Aerobics (deemsa, fiigicha) 2. Ulfaatina baachuu3.Konkolaachisuun 4.Shubbisuu 5.Hin beeku

6 Qorichootnidhiibbaadhiigaayerookamfudhachuuqabu?1.Haala dhiphina jala.2.Akkajireenyadheeraakaraamagehighdhiibbaadhiigaa.3.Yeroo sochiiwwan barbaadan4.dhaffii qaamaa.5.Yeroopaatentiintokkomiirahamaaittidhaga'amu hunda.6.Hin beeku

7 Dhiibbaadhiigaaakkamittidhukkubsataanqorichafudhachuu? 1.Akkuma odeeffannoopaatentiidhiibbaadhiigaabirooirraa argame2.Akkuma odeeffannooirraaarganne

kitaabaafi barruulee.3.Qorichootayeroodheeraa dura dhukkubakanaafajajamanfudhachuu

4.Qorichoota yerooammaadoktoraanajajamu fudhachuu.5.ani hinbeeku

8 Yeroomeeqa aboqonnaadhukkubsataadhiibbaadhiigaa? 1.Boqonnaa siree guutuu. 2. Hojiihundaergahojjetteebooda boqochuu.3. Hojiiwwangidduuttiboqodhu.(3) .

4.Sochii qaamaagochuunhinbarbaachisu. 5.Hin beeku

Caatifayyadamuu

1 Caatidaakteebeektaa 1. eeyyee 2. Lakkiyoohintaanekutaatamboodhaqi

Yerooyoomiittidaakuun_ .

2 Ji'oota 12 darbankeessa chat daaku 1. eeyyee 2. Lakkiyoohintaanekutaatamboodhaqi

3 Yooeeyyeeta'eyeroomeeqa1.Guyyaaguyyaan 2. Wee tokkottiguyyaashanhanga ja'aa3. Torbanittiguyyaasadiihangaafuriitti4.torbanittiguyyaatokkoohangalamaa 5.ji'attiguyyaatokkoohanga sadii6.Ji'atti al tokkoo gadi

6 GuyyootasanakeessaatokkotokkoZurbas/"esire" meeqa? _____ .

Fayyadamatamboo

1 Yerooammaa kana tambookanakkasigaaraa, sigaaraa, shiishaayknttuubookamiyyuuxuuxxuu, Gaayyaa? 1. eeyyee 2. Lakkiyoohintaanegara Q 5 deemi

2 Yerooammaaoomishaaleetambooguyyaaguyyaantambooxuuxuu? 1. eeyyee 2. Lakkii

3 Yeroojalqabaaftambooxuuxuujalqabdeumuriinkeemeeqature? 1 Umurii 2.hin beeku

4 Giddugaleessaanguyyaatti/torbanittioomishaaleearmaangadiikeessaameeqatambooxuuxa? GUYYAA↓ TORBEE↓

Kan oomishame ---------- ---------- .

Ujummoolee ---------- --- .

Harkaankanmarfame ---------- ---------- .

Baay'inawalgahiiShiishaa ---------- ---- .

5 Duraanoomishatambooxuuxteebeektaa? (shiishaadabalatee 1. eeyyee 2. LakkiyoohintaanekutaaAlkooliidhaqi

6 Duraanguyyaaguyyaadhaantambooxuuxteebeektaa? 1. eeyyeeYoo Q1=Eeyyee, kutaaalkooliideemi ,yoo kana hintaanegaraittiaanuttideemi

2. LakkiYoo Q1=Eeyyee, kutaaalkooliideemi ,yoo kana hintaanegaraittiaanuttideemi

7 Yerootambooxuuxuudhiiftuumuriinkeemeeqature? 1. 1.------waggaa 2. Waggoota dura

8 Guyyoota 30 darbankeessattinamnitokko mana keessankeessattitambooxuuxaaturee? 1. eeyyee 2. Lakkii

9 Guyyoota 30
darbankeessattinamnitokkobakkahojiikeessanittibakkacufameettitambooxuuxaaturee

(gamookeessatti, bakkahojiiyknwaajjiramurtaa'ekeessatti)? 1. eeyyee 2. LakkiIddoocufamettihinhojjedhu

DhugaatiiAlkoolii

1 Alkooliikanakkabiiraakamiyyuudhugdeebeektaa

wayinii, tag, tele arekee 1. eeyyee 2. Lakkiyoohintaanekutaasochiiqaamaadeemi

2 Ji'oota 12 darbankeessattialkooliikamiyyuudhugdeejirtaa 1. eeyyee 2. Lakkiyoohintaanegaraphysideemi

1.Teff Guyyaatti __.torbanitti____ji'atti_____

2.Boqqolloo Guyyaatti __.torbanitti____ji'atti_____---

3.Barlii Guyyaatti __.torbanitti____ji'atti_____

4.Qamadii,daabboodabalateeGuyyaatti __.torbanitti____ji'atti_____---

5.Sorghum/millet Guyyaatti __.torbanitti____ji'atti_____

6.RuuziiGuyyaatti __.torbanitti____ji'atti_____--- .

7.Foon LooniiGuyyaatti __.torbanitti____ji'atti_____

8.FoonallaattiiGuyyaatti __.torbanitti____ji'atti_____--- .

9.Qurxummii Guyyaatti __.torbanitti____ji'atti_____--

10 .ChickenGuyyaatti __.torbanitti____ji'atti_____--- .

11.Re'ee/HoolaaGuyyaatti __.torbanitti____ji'atti____

12.KaleeGuyyaatti __.torbanitti____ji'atti_____ .

13.Aannan Guyyaatti __.torbanitti____ji'atti_____

14.Daabboo Guyyaatti __.torbanitti____ji'atti_____--- .

15.Dhadhaa Guyyaatti __.torbanitti____ji'atti_____

16.HanqaaquuGuyyaatti __.torbanitti____ji'atti_____--- .

17.Naatiiwwan Guyyaatti __.torbanitti____ji'atti_____

18.ZayitiiGuyyaatti __.torbanitti____ji'atti_____--- .

19.Baaqelaa,baaqelaa,baaqelaa Guyyaatti __.torbanitti____ji'atti_____--- .

20.Boqqolloo mi'aawaaGuyyaatti __.torbanitti____ji'atti_____--- .

21.Boqqolloo Guyyaatti __.torbanitti____ji'atti_____-

22.KaarotaaGuyyaatti __.torbanitti____ji'atti_____--- .

23.Timaatima Guyyaatti __.torbanitti____ji'atti____

24.KaalifoorniyaaGuyyaatti __.torbanitti____ji'atti_____--- .

25.Kuduraalee magariisabaalaqabanGuyyaatti __.torbanitti____ji'atti___

26.AvokaadooGuyyaatti __.torbanitti____ji'atti_____--- .

27.Papaya Guyyaatti __.torbanitti____ji'atti_____--

28.BananaGuyyaatti __.torbanitti____ji'atti_____--- .

29.Aanaanii Guyyaatti __.torbanitti____ji'atti_____-

30.BurtukaanaGuyyaatti __.torbanitti____ji'atti_____--- .

31.Buna Guyyaatti __.torbanitti____ji'atti_____-

32.DhugaatiilallaafaaGuyyaatti __.torbanitti____ji'atti_____--- .

Annex III Questionnaire Amharic version

የተሣታፊመረጃወረቀትእናበመረጃየተደገፈየስምምነትቅጽ፡
እንዴትነህ/ነሽ? እኔ _____እባላለሁ. እኔእዚህየተገኘሁት
የጅማዩኒቨርሲቲተማሪመረሃፀደቀፍስሀንወክዬነው።የጤናኢንስቲትዩት፣የሥነ-
ምግብእናየአመጋገብየማስተርስተማሪየሆነመረሃፀደቀፍስሀከዩኒቨርሲቲውፈቃድበማግኘትየማስተርስዲግሪመመረቂያጥናትእ
ያካሄደነውየጥናቱዓላማየጅማዩኒቨርሲቲየሕክምናማዕከልንየሚከታተሉየደምግፊትበሽተኞችመካከልያለውንዉፈረትናእናተያያ
ዥምክንያቶችንማወቅነው።
ስለዚህይህጥናትበከፍተኛየደምግፊትበሽተኞችመካከልያለውንውፍረትበመቆጣጠርእናበመከላከልረገድትልቅአስተዋፅኦይኖረዋ
ል።
በተጨማሪም፣ይህጥናትየመነሻመረጃንይሰጣልብዬአምናለሁ።መንግስታዊ፣
መንግስታዊያልሆኑድርጅቶችእናባለድርሻአካላትየድርሻቸውንእንዲወጡማድረግእነዚህንችግሮችመቆጣጠር.በዚህ
ጥናትውስጥለመሳተፍበስልታዊየናሙናዘዴተመርጠዋል።
የእርስዎተሳትፎበፈቃደኝነትነውእናእርስዎለመመለስየማይፈልጉትንማንኛውንምጥያቄለመመለስአይገደዱም.
በቃለመጠይቁላይምችትካልተሰማዎት፣እባክዎን
በፈለጉትጊዜልማቋረጥነፃነትይሰማዎ።ስምዎበዚህቅጽአይጻፍምእናማንምሰው
ኮድየሌለዉመረጃከዋናውመርማሪበስተቀርማግኘትአይችልም።ሁሉምየሚያቀርቡትመረጃ
በጥብቅበሚስጥርይጠበቃል።ላልተፈለገበትዓላማፈጽሞአይውልም።
የጥናቱግኝቶችለጥናቱማህበረሰብባአጠቃላይናቸውእንጂየግለሰቦችንመረጃምንምአያንፀባርቅም።
መጠይቁስምአይሞላብተምኮድተደርጎበታል።
ከተሳታፊዎችጋርሊያገናኝየሚችልየቃልወይምየጽሁፍዘገባዎችምንምአይነትማጣቀሻየለም።

በጥናቱወቅትስለእርስዎየግልባህሪያት, የአመጋገብ
መረጃ, የአመጋገብልማድ, ከጤናጋርየተያያዙባህሪያት, የአካልብቃትእንቅስቃሴዎችቃለመጠይቅይደረግልዎታል.
ቁመትዎ፣ክብደቶእናሆድዎይለካል።ቃለመጠይቁ 30 ደቂቃያህልይወስዳል።ያስታውሱ፣
የእርስዎፍላጎትእናንቁተሳትፎለዚህጥናትስኬትበጣምአስፈላጊነው።በዚህጥናትውስጥየመሳተፍአደጋምንምአይደለም፣
ነገርግንከእርስዎጊዜ 30 ደቂቃዎችንብቻይወስዳል።በዚህጥናትውስጥበመሳተፎከፍያአይኖሮትም።

የዚህጥናትተሳትፎሙሉበሙሉበፈቃደኝነትነው. በዚህጥናትለመሳተፍምሆነላለመሳተፍየማወጅመብትአልዎት።
ለመሳተፍከወሰኑበማንኛውምጊዜከጥናቱየመውጣትመብትአልዎትእናይህእርስዎያለዎትንጥቅማጥቅሞችማጣትአያስከትልም።
መመለስየማትፈልገውንማንኛውንምጥያቄመመለስየለብህም።

የበለጠመረጃለማግኘትከፈለጉ
ዋናውንተመራማሪበሚከተለው
አድራሻማነጋገርይችላሉ፡የዋናተመራማሪስም፡መረሀፀደቀፍስሀ

ኢሜል፡ mereye2009@gmail.com ሞባይል፡ 0912006069

2. በመረጃየተደገፈየስምምነትቅጽ

የቀረበውንመረጃበመረዳትላይበመመስረትበዚህጥናትለመሳተፍፈቃደኛኖት?
(A) አዎ… (1) ..... “አዎ” ከሆነ፣ወደመጠይቁይቀጥሉ
(ለ) ቁጥር… (2) .... “አይ” ከሆነ፣ወደቀጣዩተሳታፊይዝለሉ።

ኮድ _____ ቀን _____ የመረጃሰብሳቢስም_____		
የደምግፊትእናአንትሮፖሜትሪክመለኪያ		
1	የደምግፊት	አሁንያለው_____2 ኛ_____ 3 ኛ_____
2	የደምግፊትደረጃ	1.ደረጃአንድ …… 2. ደረጃሁለት ……3. አል …… .
3	በአሁኑጊዜምንተጓዳኝበሽታዎችአሉዎት?	1. የስኳርበሽታ…2. አስም … 03.ካርዲያክ 4. ይኩላሊትበሽታዎች 5. ሌሎች 6.አ ….
4	BMI	1.ቁመት _____ _ ሜትር 2. ክብደት _____ኪ.ግ
6	የወገብዙሪያ	_____ ሴ.ሜ
ሶሺዮሰነ-ሕዝብ		
1	ዕድሜ	1._____አመት 2. አላውቅም
2	ጾታ	1.ወንድ2.ሴት
3	ትምህርት	1.ምንምመደበኛትምህርትያላገኘ -2. የመጀመሪያደረጃትምህርት 3. የሁለተኛደረጃትምህር የኮሌጅዲግሪእናከዚያበላይ
4	የጋብቻሁኔታ	1 ባለትዳር። 2 ያላገባ። 3.መበለት 4. ተለያይቷል 5. የተፋታ
5	የቤተሰብዎአማካይወርሃዊወይምአመታዊገቢስንትነው።	1.ወርሃዊ ___ብር2.ዓመት _____. ብር
6	ቋሚየመኖሪያቦታ	1. ጅማ -2. ከጅማውጪ(ከተማ) -3. ከጅማውጪ (ገጠር)
7	የቤተሰብአባላትብዛት	----
8	የስራ/የቅጥርሁኔታ	1.የቤትመቤ 2. መንግስትተቀጥራ3.የመንግስትያልሆነሰራተኛ4.ነጋዴ 5.የእለትሰራተኛ 6.ጠ 7..ስራአጥ 8.ገበሬ 9.በግልተዳዳሪ 10 ሌላይግለጹ ---
የጤናሁኔታመገለጫ		
1	የደምግፊትእንዳለብዎትካወቁምንያህልጊዜሆኖት	_____ ዓመታት _____ወራት
2	ክትትልከጀመሩምንያህልጊዜሆኖት	_____ ዓመታት _____ወራት
3	የደምግፊትየቤተሰብታሪክአለህ?	1.አዎ 2. አይደለም----
የደምግፊትመቆጣጠሪያእውቀት		
1	ከሚከተሉትዘዴዎችውስጥየትኞቹየደምግፊትንለመቆጣጠርይጠ	1.በአመጋገብማስተካከል 2. በመድሃኒት 3. መደበኛየአካልብቃትእንቅስቃሴ 4. አመጋገብ፣መድሀኒትእና .የአካልብቃትእንቅስቃሴ4.አላውቅም
2	የደምግፊትበአመጋገብየምናከመውአንዴትነዉ	1. ውሃመቀነስ 2. የጨውመጠንመቀነስ 3. የጨውመጠንመጨመር 4.በካሎሪየበለጸጉምግቦችመቀነስ 5. አላውቁም
3	ከሚከተሉትምግቦችውስጥየደምግፊትህመምተኛከየትኛውመራ	1.ጨውየበዛበትናእናጨዋማምግቦች 2. ቅመምየበዛባቸውምግቦች 3. ቅባትየበዛባቸውምግቦች4. አትክልት 5. 5. አላውቁም
4	የደምግፊትላለውህመምተኛበቀንምንያህልጨውይሰጣል?	--- gm
5	የደምግፊትንለመቆጣጠርምንዓይነትየአካልብቃትእንቅስቃሴጥሩ	1.(መራመድ፣ሶምሶማመሮጥ) 2. ክብደትማንሳት3.መኪናመንዳት4.ዳንስ 5.አላውቅ
6	የደምግፊትመድሃኒቶችበየትኛውጊዜመወሰድአለባቸው?	1.በጭንቀትሁኔታውስጥ2..የድሜልክየደምግፊትንመቆጣጠሪያመንግድ 3.እንቅስቃሴዎችሲፈልጉ4.ከባድስራወይምከባድአንቅስቃሴለማድርግ. 5 .መጥፎስሜትበሚሰማበትጊዜ6.አላውቅም
7	የደምግፊትበሽተኛእንዴት መድሃኒቶችንይወስዳል?	1. ከሌሎችየደምግፊትያላቸውሰዎችበተገኘመረጃ 2. ከመፅሃፍቶችእናሌሎችጹሁፎችበተገኘ መረጃ . 3ከረጅምጊዜበፊት.ለበሽታውየታዘዙመድሃኒቶችን መውሰድ4.በአሁኑጊዜበሀኪምየታዘዙመድሃኒቶችንመውሰድ.5.አላውቅም.
8	የደምግፊትበሽተኛምንያህልጊዜማረፍአለበት?	1.ሙሉበሙሉሁልጊዜበአልጋይላማረፍ. 2. ሥራውንሁሉከጨረስኩበኋላማረፍ. 3. በእንቅስቃሴዎችመካከልእረፍትያድርጉ(3) 4. የአካልብቃትእንቅስቃሴማድረግአያስፈል 5. አላውቅም
	የጫትአጠቃቀም	
1	**ጫትቅመህ**ታውቃለህ	1. አዎ 2. አላዉቅምካልሆነወደትምባሆከፍልይሂዱ
	ምንያህልጊዜትቅምነበር።	_
2	ባለፉት 12 ወራትውስጥ**ጫትቅመህል**	1. አዎ 2. አይሆንምካልሆነወደትምባሆከፍልይሂዱ
3	አዎከሆነስንትጊዜ	1.ዕለታዊ 2. ከአምስትእስከስድስትቀናትበ wee3. በሳምንትከሶስትእስከአራትቀናት 4. በሳምንትከአንድእስከሁለትቀናት 5. በወርአንድእስከሶስትቀን 6. በወርከአንድጊዜያነሰ
6	ስንትዙርባስ /" ኢሲሬ" ላይከእነዚያቀናትበአንዱ ?	____
የትምባሆአጠቃቀም		
1	በአሁኑጊዜእንደሲጋራ፣፣ሺሻ፣ጋያያሉትንባሆያጨሳሉ?	1. አዎ 2. አይሆንምካልሆነወደ Q 5 ይሂዱ
2	በአሁኑጊዜየትምባሆምርቶችንበየቀኑያጨሳሉ?	1. አዎ 2. አይደለም
3	ማጨስለመጀመሪያጊዜስትጀምርስንትአመትህነበር?	1 ዕድሜ 2. አላውቅም

4	በአማካይ፣በቀን/ሳምንትከሚከተሉትምርቶቸውስጥምንያህሉን	በየቀኑ↓ በየሳምንቱ↓ ተመረተ ---------- ቧንቧዎች ---------- በእጅየተጠቀለለ ---------- የሺሻከፍለጊዜዎችብዛት ----------
5	ከዚህቀደምየትምባሆምርቶችንአጨስታውቃለህ? (ሺሻንጨም	1. አዎ 2. አይሆንምካልሆነወደ Q 8 ይሂዱ
6	ቀደምባሉትጊዜያትበየቀኑታጨስነበር?	1. አዎQ1=አዎከሆነ፣ወደአልኮሆልከፍልይሂዱ፣ካልሆነወደሚቀጥለውይሂዱ 2. አይQ1=አዎከሆነ፣ወደ Q 8 ይሂዱ፣ካልሆነወደሚቀጥለውይሂዱ
7	ማጨስስታቆምስንትአመትህነበር?	2. 1.-----አመቴነበር 2. _____ ከአመታትበፊት
8	ባለፉት 30 ቀናትውስጥበቤትዎውስጥያጨሰሰዉነበረ?	1. አዎ 2. አይደለም
9	ባለፉት 30 ቀናትውስጥበስራቦታዎውስጥ (በተዘጉቦታዎችበህንፃውውስጥ, በስራቦታወይምበተለየቢሮው ያጨሰሰዉነበር?	1. አዎ 2. አይበተዘጋቦታአልሰራም።
	የአልኮልፍጆታ	
1	አንደወይን፣, ተጅ፣, ጠላ፣አረኬ፣ቢራ፣ያለአልኮልጠጥተውያውታ	1. አዎ 2. አይሆንምካልሆነወደየአካልብቃትእንቅስቃሴከፍልይሂዱ
2	ባለፉት 12 ወራትውስጥአልኮልጠጥተዋል?	1. አዎ 2. አይሆንምካልሆነወደየአካልብቃትእንቅስቃሴከፍልይሂዱ
3	ባለፉት 12 ወራትውስጥቢያንስአንድጠርሙስ/ብርጭቆ/ቢርሌ መለኪያ**ምንያህልበተደጋጋሚ**ጠጥተዋል ?	1በየቀኑ 2.በሳምንትከአምስትእስከስድስትቀናት 3. በሳምንትከሶስትእስከአራትቀናት 4።በሳ .አንድእስከሁለትቀናትበሳምንት 5. በወርከአንድእስከሶስትቀን 6. በወርከአንድጊዜያነሰ 7. በ
4	ባለፉት 30 ቀናትውስጥአልኮልጠጥተዋል?	1. አዎ 2. አይሆንምካልሆነወደየአካልብቃትእንቅስቃሴከፍልይሂዱ
5	ባለፉት 30 ቀናትውስጥ፣ቢያንስአንድጠርሙስ/ብርጭቆ/ቢርሌ መለኪያየጠጡበት ስንትኢጋጣሚዎችአሎትነበሩ	2. ቁጥር ---2. አላውቅም3 .ዜሮ
6	ባለፉት 30 ቀናትውስጥ፣አልኮልሲጠጡ፣ በአንድየመጠጥወቅትበአማካይስንትአንድጠርሙስ/ብርጭቆ/ቢ መለኪያጠጡ ?	1.ቁጥር --2. አላውቅም
	አካላዊእንቅስቃሴ	
1	1.ቢያንስ 10 ደቂቃያለማቋረጥ .ኃይለኛእንቅስቃሚጠይቅስራት 1አዎ 2.አየደለም 2. ቢያንስ 10 ደቂቃያለማቋረጥ .መካከለኛእንቅስቃሚጠይቅስራትሰራለህ 1 አዎ 2.አየደለም 3. አልሰራም	1.በተለመደውሳምንትየቀናትብዛት ------ 2.በቀን ------.ሰዓታት --------.ደቂቃ---------
2	ወደቦታዎችለመሄድቢያንስለ 10 ደቂቃዎችያለማቋረጥ?በእግርወይም(	1. አዎ 2. አይደለም
3	ወደቦታዎችለመሄድቢያንስለ 10 ደቂቃዎችያለማቋረጥ?በእግርወይምበብስክሌትመንዳትምንያህልጊዜያ	1.በተለመደውሳምንትየቀናትብዛት ------ 2.በቀን ------.ሰዓታት --------.ደቂቃ---------
4	ስፖርት፣የአካልብቃትወይምመዝናኛቢያንስ 10 ደቂቃቀጣይነትያለውአንቅስቃሴ 1. ኃይለኛ ,2. መካከለኛ 3. አልሰራም	1.በተለመደውሳምንትየቀናትብዛት ------ 2.በቀን -.ሰዓታት --------.ደቂቃ---------
5	በተለመደውቀንምንያህልጊዜበመቀመጥያሳልፋሉ?	1.ሰዓት ---- 2.ደቂቃ -------
	የአመጋገብልምምድጥያቄዎች	
1	በተለመደውሳምንትውስጥየተለመደበቀንስንትጊዜይመገባሉ	1.አንድ 2. ሁለትጊዜ3 .ሶስትጊዜ 4. አራትጊዜእናከዚያበላይ
2	በተለመደውሳምንትውስጥበሳምንትከቤትውጭይመገባሉ	1.ቀን/ጊዜ ---- 2. አላስታውስም 3. ከቤትወጥቼአልበላም።
3	በተለመደውሳምንትውስጥምንያህልጊዜመክሰስይበላሉ	1.ቀን/ጊዜ---- 2. አላስታውስም 3. አልበላም።
4	በተለመደውሳምንትቁርስምንያህልጊዜይዘለላሉ	1.ቀን/ጊዜዎች---- 2. አላስታውስም 3. አልዘልምም።
5	በተለመደውሳምንትውስጥምንዓይነትዳቦይበላሉ	1.ያልትፈተገዳቦ፣ 2. ነጭዳቦ - 3. ዳቦአልበላም ---
6	ለማብሰልምንዓይነትዘይትይጠቀማሉ	1.ፈሳሽ 2. የሚረጋን3 .የእንስሳትስብ .4.ቅቤ
8	በተለመደውሳምንትውስጥምንያህልጊዜፈጣንምግቦችንይመገባ (ለምሳሌቺፕስ፣በርገር፣ፒዛ፣የተጠበሱምግቦች	1.ቀን/ጊዜ---- 2. አላስታውስም 3. አልበላም።
9	በተለመደውሳምንትውስጥጣፋጮች (ለምሳሌጣፋጮች፣ብስኩት፣ኩኪሶች፣ኬኮች፣ቸኮሌትባር) በየስንትጊዜይበላሉ	1.ቀን/ጊዜ---- 2. አላስታውስም 3. አልበላም።
1	የጨውአጠቃቀምዎእንዴትነው?	1.በምግቤውስጥየጨውመጠንንሙሉበሙሉማስወገድ2.የተገደበየጨውመጠን-3.ጨውአይ

ባለፉት 30 ቀናትወይምባለፈውአንድወርውስጥበልተህታውቃለህ ---- አዎከሆነበየስንትጊዜው		
	1.ጤፍበቀን __.በሳምንት _____ በወር_____ አልብላሁም	2.በቆሎበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	3.ገብስ(ገበስ) በወር_____ አልብላሁም	በቀን __.በሳምን 4. ስንዴዳቦንጨምሮ _ በቀን __.በሳምንት _____ በወር_____ አልብላሁም_____---
	5. ማሼላ / ዘንጋዳበቀን __.በሳምንት _____ በወር_____ አልብላሁም	6.ሩዝበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	7.የብሬስጋበቀን __.በሳምንት _____ በወር_____ አልብላህ	
	9. አሳበቀን __.በሳምንት _____ በወር_____ አልብላሁም_	10 .ዶሮበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	11.ፍየል/ በግስጋበቀን __.በሳምንት _____ በወር_____ አ	12.ጉበትበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	13. ወተትበቀን __.በሳምንት _____ በወር_____ አልብላህ	14አይብበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	15.ቅቤበቀን __.በሳምንት _____ በወር_____ አልብላሁም	16.እንቁላልበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	17. ለውዝበቀን __.በሳምንት _____ በወር_____ አልብላህ	18.ዘይትበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	19. ባቄላ፣አተር፣ምስስርሽሮበቀን __.በሳምንት _____ በወር_ አልብላሁም	20. ስኳርድንችበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	21. ድንችበቀን __.በሳምንት _____ በወር_____ አልብላሁ	22.ካሮትበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	23.ቲማቲምበቀን __.በሳምንት _____ በወር_____ አልብላ	24አበባጎመንቁሩምቦበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	25. ጎመንሰላጣ፣ቆስጣ አረንጓዴበቀን __.በሳምንት _____ በወር_____ አልብላሁም	26.አቮካዶበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	27.ፓፓያበቀን __.በሳምንት _____ በወር_____ አልብላሁ	28.ሙዝበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	አናናስአናናስበቀን __.በሳምንት _____ በወር_____ አልብላ	30.ብርቱካንበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	31. ቡናበቀን __.በሳምንት _____ በወር_____ አልብላሁም	32.ለስላሳመጠጦችበቀን __.በሳምንት _____ በወር_____ አልብላሁም
	33.ማንጎበቀን __.በሳምንት _____ በወር_____ አልብላሁ	34.አፕልበቀን __.በሳምንት _____ በወር_____ አልብላሁም

DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

Name: _____

Signature: _____

Name of the institution: _____

Date of submission: _____

This thesis has been submitted for examination with my approval as university advisor

Name and Signature of the first advisor _____

_____

Name and Signature of the second advisor _____

_____