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# DIETARY PRACTICE AND ASSOCIATED FACTORS AMONG HYPERTENSIVE PATIENTS IN ADDIS ZEMEN PRIMARY HOSPITAL AND HEALTH CARE CENTER: NORTHWEST ETHIOPIA

HUSSIEN, SULEYMAN

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**BAHIR DAR UNIVERSITY**

**BAHIR DAR INSTITUTE OF TECHNOLOGY**

**SCHOOL OF RESEARCH AND POSTGRADUATE STUDIES**

**FACULTY OF CHEMICAL AND FOOD ENGINEERING**

**DIETARY PRACTICE AND ASSOCIATED FACTORS AMONG  
HYPERTENSIVE PATIENTS IN ADDIS ZEMEN PRIMARY HOSPITAL  
AND HEALTH CARE CENTER: NORTHWEST ETHIOPIA**

**BY;**

**SULEYMAN HUSSIEN**

**JUNE, 2019**

**BAHIRDAR, ETHIOPIA**

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PATIENTS IN ADDIS ZEMEN PRIMARY HOSPITAL AND HEALTH CARE CENTER:  
NORTHWEST ETHIOPIA**

**BY;  
SULEYMAN HUSSIEN**

A research thesis submitted to the school of Research and Graduate Studies of Bahir Dar  
Institute of Technology, BDU in the partial fulfillment of the requirements for the degree of  
Master of Science in applied human nutrition in the faculty of chemical and food engineering

**Main Advisor name- Prof. Reddy PCJ Prasad**

**Co-advisor name- Mr. Girma Nega**

JUNE, 2019  
BAHIRDAR, ETHIOPIA

## DECLARATION

I, the undersigned, declare that the thesis comprises my own work. In compliance with internationally accepted practices, I have acknowledged and refereed all materials used in this work. I understand that non-adherence to the principles of academic honesty and integrity, misrepresentation/ fabrication of any idea/data/fact/source will constitute sufficient ground for disciplinary action by the University and can also evoke penal action from the sources which have not been properly cited or acknowledged.

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Date of submission: \_\_\_\_\_

Place: Bahir Dar

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

Advisor Name: \_\_\_\_\_

Advisor's Signature: \_\_\_\_\_

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**Bahir Dar Institute of Technology**  
**School of Research and Graduate Studies**  
**FACULTY OF CHEMICAL AND FOOD ENGINEERING**  
**THESIS APPROVAL SHEET**

Student: Suleyman Hussien [Signature] 20/06/19  
Name Signature Date

The following graduate faculty members certify that this student has successfully presented the necessary written final thesis and oral presentation for partial fulfillment of the thesis requirements for the Degree of Master of Science in applied human nutrition

Approved By:  
Advisor: Prof. Reddy Prasad [Signature] 18/07/2019  
Name Signature Date  
External Examiner: Amane Torsku [Signature] 18/07/2019  
Name Signature Date  
Internal Examiner: Dr. Hint Asaye [Signature] 18/07/2019  
Name Signature Date  
Chair Holder: Dr. Masfin Wogayehu [Signature] 18/07/2019  
Name Signature Date  
Faculty Dean: Ali Seid [Signature] 29/07/2019  
Name Signature Date

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## **ABSTRACT**

**Back ground-** Hypertension is a major worldwide public health problem because of its high prevalence with vascular disease, premature death, stroke, renal diseases and retinopathy. It is the most important risk factor for cardiovascular diseases which kill about 12 million annually worldwide, more than any other diseases.

The **aim** of the study mainly focuses on the assessment of dietary practice and associated factors among hypertensive patients.

**Methods:** Facility-based cross-sectional study was conducted among 356 hypertensive patients in Addis Zemen primary hospital and health care from June-July 2018. Simple random sampling was used to select study participants. Data were entered to Epi-info 7 and exported to Statistical Package for Social Sciences (SPSS) version 20.0 for analysis. A binary Logistic regression model was fitted to determine independent predictors of dietary practice among hypertensive patients. Adjusted odds ratio at 95%CI was used to declare the independent effect of each variable on the outcome variable.

**Result:** The study revealed that 94(27.4%) of patients practiced healthy dietary activity and majority (90.9%) of patients lead sedentary life. The study found that Age (Adjusted Odds Ratio [AOR]=0.33,95% Confidence Interval [CI):(0.14-0.76), Residence area (AOR=0.34,95% CI: 0.15-0.78), Duration since diagnosis(AOR=1.8, 95%CI:1.3-2.6), Educational status(AOR = 1.5, 95% CI:1.08-1.52) and Physical activity (AOR = 0.22, 95%CI: 0.054-0.89)were factors significantly associated with healthy dietary practice ( $p < 0.05$ ).

**Conclusion:** Majority of hypertensive patients in Addis Zemen primary hospital and health care center had unhealthy dietary practices due to poor knowledge about recommended dietary practice poor diversification of feed types. Therefore, creation of awareness about recommended dietary practice and diversification of feed types for hypertensive Patients should be conducted that may help them to control their blood pressure.

**Keywords:** Hypertension, Lifestyle modification, Practice, Hospital, Addis Zemen, Amhara

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## **LIST OF ABBREVIATIONS**

BP: - Blood Pressure

CVD: - Cardiovascular Diseases

CO: - Central Obesity

CNCD: - Chronic non communicable disease

CSA: - Central Statistical Agency

DALY: - Disability adjusted life years

DASH: - Dietary Approaches to Stop Hypertension

DBP: - Diastolic Blood Pressure

EDHS: - Ethiopian Demographic and Health Survey

ESC: -European Society of Cardiology

HTN: - Hypertension

MmHg: - Millimeters of Mercury

NCD: - Non Communicable Disease

NHANES: - US National Health and Nutrition Examination Survey

SBP: - Systolic Blood Pressure

SPSS: - Statistical Package for Social Science

SSA: - Sub Saharan Africa

WHO: - World Health Organization

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# **1. INTRODUCTION**

## **1.1. Back ground**

Hypertension is defined as sustained elevated arterial blood pressure measured indirectly by an inflatable cuff and pressure manometer.

Hypertension is an important public health challenge in both economically developing and developed countries and is one of the most important risk factor for cardiovascular and cerebrovascular morbidity and mortality accounting for an estimated 54% of all strokes and 47% of all ischemic heart disease events globally (CM Lawes, 2001). It is also one of the most frequent chronic conditions in medical consultation (SR Nichols, 1996). In developed world about 330 million people worldwide have hypertension as do around 640 million in the developing world.

The prevalence of HTN is also increasing in Sub-Saharan African countries as well. The disease has been found to be more prevalent among people of urban residence. According to a recent finding, there were ~75 million adults living with HTN in sub-Saharan Africa. This study estimated that the figure will rise to 125.5 million in the coming 10–15 years (Nshisso LD, 2012, Ogah OS, 2013, Warren-Findlow J, 2011).

In Ethiopia, out of the total number of deaths in people aged, 70 years, 66.5% (males) and 63.2% (females) of deaths are accountable to non-communicable diseases. Findings of studies conducted in Ethiopia show gradual increment in the total number of HTN cases. According to a recent study, HTN was found to be the most prevalent non-communicable disease with an overall prevalence of 19.1%. This increment is attributed to the rise of risk

factors including smoking, obesity, harmful use of alcohol, and sedentary lifestyle. (Alwan A, 2010, Nshisso LD, 2012, Ogah OS, 2013).

Lifestyle modification, previously termed non-pharmacologic therapy, has important roles in hypertensive as well as non-hypertensive individuals. In hypertensive individuals, lifestyle modifications can serve as initial treatment before the start of drug therapy and as an adjunct to medication in persons already on drug therapy. In hypertensive individuals with medication-controlled BP, these therapies can facilitate drug step-down and drug withdrawal in highly motivated individuals who achieve and sustain lifestyle changes. In non-hypertensives, lifestyle modifications have the potential to prevent hypertension, and more broadly to reduce BP and thereby lower the risk of BP-related clinical complications in whole populations. Indeed, even an apparently small reduction in BP, if applied to an entire population, could have an enormous beneficial effect on cardiovascular events (Stamler J, 1889).

It is recommended that at least 4-5 servings of fruits and vegetables should be consumed per day. A diet rich in fruits and vegetables, low-fat dairy foods and reduced saturated and total fat can substantially lower blood pressure. This type of diet also helps to prevent and treat hypertension. In a randomized controlled clinical trial conducted by Appel et al. (1997), it was found that a diet rich in fruits, vegetables, and low-fat dairy products and with reduced saturated and total fat (combination diet) reduced the blood pressure by 5.5/3.0 mm Hg more than the control diet (low in fruits, vegetables, and dairy products). A diet rich in fruits and vegetables reduced systolic blood pressure by 2.8 mm Hg and diastolic blood pressure by 1.1 mm Hg more than the control diet (Appel et al. 1997).

## **1.2. Problem statement**

Diets rich in fruits, vegetables, and low-fat dairy products that include whole grains, poultry, fish, and nuts, that contain only small amounts of red meat, sweets, and sugar-containing beverages, and that contain decreased amounts of total and saturated fat and cholesterol have been found to have a protective effect against CVDs (Sacks et al., 2001 and Yusuf et al., 2012). Nutrition transition has resulted in replacement of these diets with diets that are high in saturated fats, sugars, and salt. Consumption of foods high in saturated fats, sugars and salt coupled with decreased physical activity has resulted in increased prevalence of NCDs.

Because of hypertensive patients are facing many health care issues and challenges such as less awareness and health education which increase difficulties to change their lifestyle behaviors such as; modification of diet, stop smoking, increase physical activity and decrease weight (Khatib O.M, 2005), therefore these patients should be targeted for specific assessment and interventions to overcome any challenges and obtain adequate health awareness about hypertension and understanding of lifestyle behavior modifications which play an important role in the ability to successfully control of disease, its symptoms and prevent short and long term complications.

Thus the aim of this study was focused on the assessment of dietary practice and associated factors in the study area due to little known about the dietary practices of hypertensive patients and the factors having a relation with the dietary activity.

### **1.3. Objectives of the study**

#### **1.3.1. General objective**

The general objective of the study mainly focused on the assessment of dietary practice and associated factors among hypertensive patients in Addis Zemen primary hospital and health care center.

#### **1.3.2. Specific objectives**

1. Assessment of dietary practices of hypertensive patients
2. Investigation of associated factors with dietary practice



#### **1.4. Scope of the study**

Nutrition-based approaches are recommended as first-line therapy for the prevention of hypertension in individuals with high normal blood pressure (BP) and to control BP in patients with Stage 1 hypertension. To date, most recommendations for life style modifications have focused on reducing salt intake, weight loss, and moderation of alcohol consumption.

Dietary assessment is necessary to investigate the association between health and diet and to find out which dietary recommendations are being followed. The role of dietary factors singly or in combination in blood pressure regulation and to what extent each contributes has been a subject of research for many decades, and despite this, it remains controversial. Modifying one's diet can be a difficult and significant change in life, and many patients oppose this or fail despite several attempts.

Given how frequently clinicians have to provide patients with this recommendation and the potential impact on the overall outcome in patient health, it is of great benefit to study the current evidence in nutritional practice to hypertension management.

In this study the adherence of hypertensive patients to recommended healthy dietary practices and associated factors that play a role in determining the severity of the disease were assessed in hypertensive individuals in the target area.

## **1.5. Significance of the study**

The lifestyle factors that are recommended for reducing hypertension include: losing weight, regular physical exercise, moderate alcohol consumption, a change in diet and reduced sodium intake (Eskridge, 2010). The dietary approaches to stop hypertension (DASH) diet recommends lots of fruits and vegetables, low-fat dairy products, low in total fat, saturated fat and cholesterol. DASH diet has produced effective results in lowering hypertension (Reedy, J., 2008).

In spite of emerging empirical evidence of the efficacy of lifestyle modification in blood pressure control, little is known about the practice of dietary activity and associated factors among hypertensive patients in Ethiopia particularly in our study setting.

The study gives first line information about actual dietary practice and associated factors of hypertensive patients in the study area. Intern; this should enable relevant health administrators to develop comprehensive and appropriate community-based health promotion strategies to encourage healthy lifestyles and appropriate dietary practice for prevention and control of hypertension among its population. This document will also serve as a comprehensive evaluation for the nature of dietary practice of hypertensive patients.

Above all, since there is no research conducted in similar area of the interest in the study area, the finding of this study may be used as a reference line data for those who are interested in carrying out further research.

## **2. LITREATURE REVIEW**

### **2.1. Dietary Practices**

Dietary practices are influenced by demographic and socio-economic status, and environment (Perkovic et al., 2007). Many hypertensive patients have been found to have unhealthy dietary practices. A study by Suliburska et al. (2012) in Poland involving 308 hypertensive patients revealed that a majority (87%) of the patients consumed diets high in fat, low in fruits and vegetables and had inadequate physical activity. Ogedegbe et al. (2014) reported that most hypertensive patients had high dietary salt intake. In a study by Wyka et al. (2012) it was reported that development of heart diseases was connected to inadequate consumption of vitamin C, calcium and fiber.

A study by Okwuoni et al. (2014) in Nigeria involving 252 hypertensive patients found that 80% of the patients consumed unhealthy foods high in sodium, fat and low in dietary fiber. In addition, another study by Leon-Munoz et al. (2012) on dietary habits of hypertensive patients in Spain found that 60% of the patients were not following dietary recommendations. Findings from another study by Yehia et al. (2015) in Gaza on 120 hypertensive patients indicated that 65.1% of the patients never honored dietary change advice in their food intake. The study further blamed the low levels of compliance to diet recommendations on patient's ignorance and socio-demographic factors.

Potassium is a nutrient that regulates blood pressure by balancing out the negative effects of sodium. Deficiency in dietary potassium intake raises sodium levels in the blood resulting in fluid retention increasing blood pressure (Opie & Seedat, 2005). Potassium and calcium work together to regulate blood pressure, increased potassium and adequate calcium intake lowers

blood pressure (Houston, 2011). Potassium aids in achievement of optimal sodium levels in the cells (Houston, 2011; Opie & Seedat, 2005). According to Houston (2011) a daily dietary intake of 0.6 g of potassium lowers systolic blood pressure by 1.0 mmHg and diastolic blood pressure by 0.52 mmHg.

The type of dietary fat consumed also influences blood pressure and nutrition status. Blood pressure is raised by excess consumption of saturated fats and trans-fats since they increase low density lipoproteins (Larstorp and Tonstad, 2016). Consequently a fatty plaque is formed that reduces arteries flexibility thus increasing blood pressure (Baumer, 2007; Hall et al., 2015).

Carbohydrates can also influence blood pressure in that overconsumption of carbohydrates results in overproduction of insulin, a hormone that stimulates conversion of excess glucose to body fat resulting in overweight and obesity (Howard et al., 2008; Kayima et al., 2015). Dietary fiber plays a protective role in heart functions. B-glucan, the main soluble fiber component in dietary fiber lowers plasma cholesterol and triglyceride levels contributing to weight loss which in turn reduces blood pressure level (Pal and Radavelli, 2012). A study by Jiménez et al. (2008) on 34 hypertensive patients reported that antioxidant fiber lowered total cholesterol by 9% and decreased SBP and DBP by 6% and 5% respectively.

## 2.2. Physical Activity

Unhealthy dietary behaviors often occur in association with other unhealthy behaviors such as physical inactivity and smoking. Furthermore, unhealthy dietary practices such as high consumption of saturated fats, salt and refined carbohydrates as well as low consumption of fruit and vegetables tend to cluster together. In contrast, persons who habitually adopt one healthy dietary practice are more likely to adopt other healthy dietary habits as well as practice regular physical activity and abstinence from smoking. Dietary behaviors may also reflect patterns influenced by social class and may be influenced by stress levels. Dissociating the specific effects of individual dietary components from other dietary components, physical activity levels and other behaviors becomes difficult outside the setting of a carefully controlled clinical trial (K Srinath R., 2004).

Physical activity has potential positive effect on blood pressure; reduces depression risk and improves cognitive function in turn achieving optimal blood pressure levels in hypertensive patients (Naser et al., 2016; Roberts & Barnard, 2005). Regardless of physical activity benefits, inadequate physical activity engagement has been observed a situation that has been blamed on urbanization and industrialization (WHO, 2011).

According to WHO (2011) about a third of adults globally are physically inactive. Sedentary lifestyle is an independent risk factor for increased blood pressure, diabetes mellitus and heart diseases (Asgedomet *et al.*, 2016; Gordon-larsen *et al.*, 2009). Sedentary lifestyle is associated with 30% cases of hypertension (Viera et al., 2008).

Globally physical inactivity contributes to 1.9 million deaths yearly (WHO, 2011). Sedentary lifestyle jointly with high energy intake contributes to weight gain leading to obesity (Aziz,

2016; Naser et al., 2016). A study by Okwuoni *et al.* (2014) found that 87% hypertensive patients had low physical activity levels. A study by Alsairafi et al. (2013) also reported that 75% of hypertensive patients were sedentary.

Regular engagement in physical activity lowers blood pressure by 15% independent of weight loss (Chase and Sui, 2009). A study by Bento (2015) reported that regular aerobic exercise lowered blood pressure in previously inactive individuals. Antonio et al. (2006) reported that regular exercise reduced SBP by 7.5 mmHg and DBP by 6.7 mmHg.

### **2.3. Alcohol Consumption and tobacco use**

A strong positive relationship between regular, heavier (more than 2 drinks per day) alcohol intake and hypertension has been reported in several cross-sectional and prospective studies. The relationship is evident in both sexes and several races and is independent of the type of alcoholic beverage, adiposity, education, smoking, salt intake, and several other traits (Klatsky, 1996). Results from clinical experiments show that blood pressure falls when one stops drinking and that it rises again within days after resuming drinking. Excessive alcohol consumption is an important and insufficiently recognized risk factor of hypertension (Saunders et al., 1981).

In 2008, Sesso et al., found that light-to-moderate alcohol consumption decreased hypertension risk in women and increased it in men. In women, the risk starts to appear when consuming more than 4 drinks per day and in men it starts to appear when moderately drinking (more than 1 drink per day). However, when other factors such as body mass index, diabetes, and high cholesterol were factored, the benefits of alcohol in the light-to-moderate range disappeared and strengthened the adverse effects of heavy alcohol intake. More studies

presenting evidence of the relationship between alcohol intake and hypertension and its related cardiovascular complications are reviewed in Klatsky and Gunderson (2008).

Complete cessation of smoking by both pre-hypertensive and hypertensive individuals is recommended. In a study conducted by Paffenbarger et al., (1991) smoking and hypertension were the strongest risk factors for mortality within an individual. A combination of smoking and lack of physical activity were the most dangerous risk factors among the studied population. Krauss *et al.*, (2000) recommends that there is need to prevent weight gain among habitual smokers who stop smoking.

## 2.4. Conceptual frame work

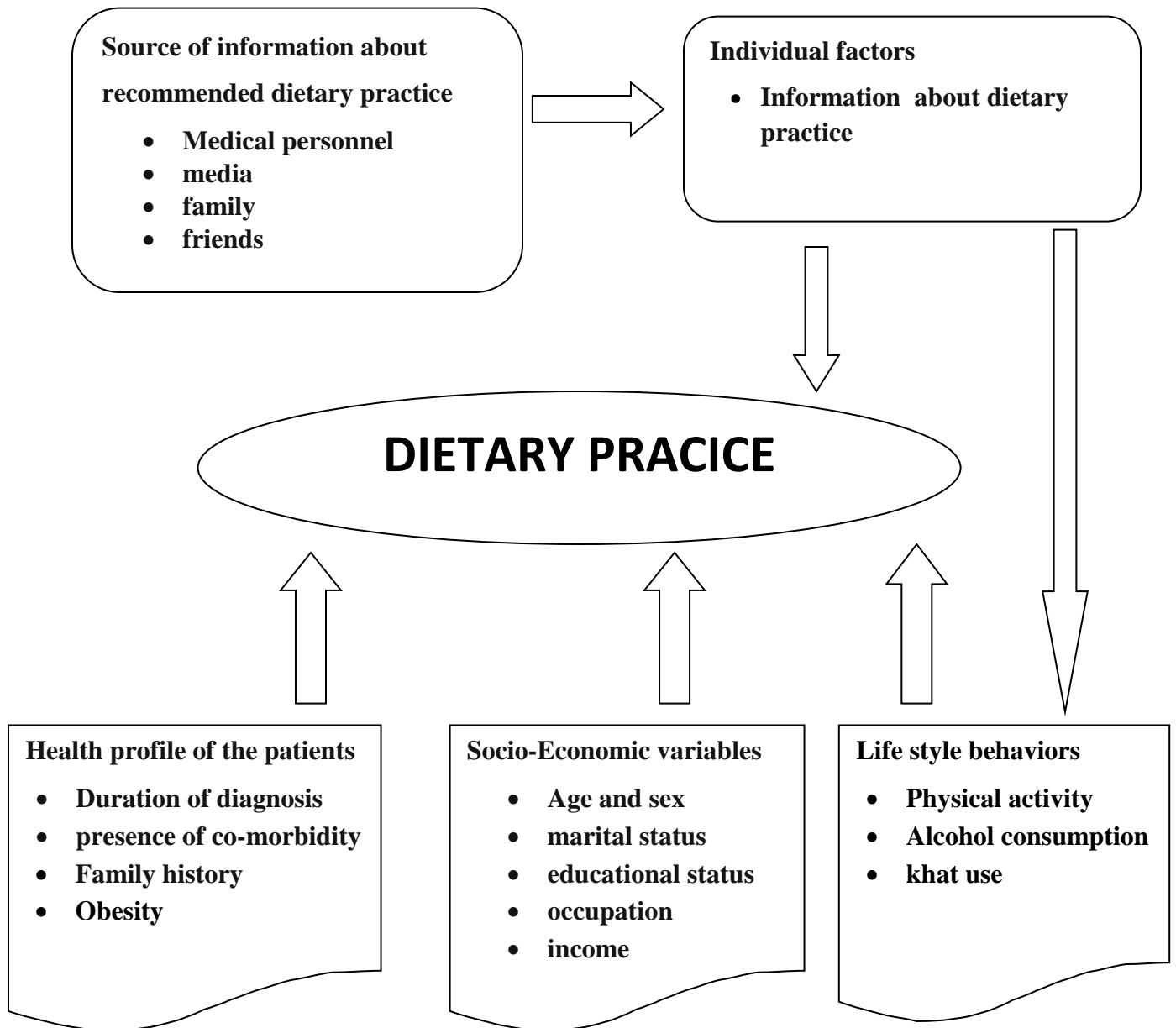


Figure 1: Conceptual frame work indicating factors associated with dietary practice. This conceptual frame work is developed after through literature review



### **3. METHDOLOGY**

#### **3.1. Study area and period**

Addis Zemen is a town in northern central Ethiopia. Located in the Debub Gondar Zone of the Amhara Region, on the road connecting Gondar and Bahir Dar

Based on figures from the Central Statistical Agency in 2005, this town has an estimated total population of 24,849, of whom 12,245 were males and were 12,604 females. The 1994 census reported this town had a total population of 14,342 of whom 6,443 were males and 7,899 were females (CSA, 2012). Addis Zemen has one primary hospital and one health care center owned by the government and two private owned medium clinics.

The study was conducted in a period from June to half of July 2018 in Addis Zemen primary hospital and health care center for the assessment of dietary practices and associated factors among hypertensive patients.

#### **3.2. Study design and population**

A facility-based cross-sectional study was conducted in Addis Zemen Primary Hospital and health care center. The source population was hypertensive patients in Addis Zemen Primary Hospital and Health care center. The study population was hypertensive patients who were following their treatment during the study period.

#### **3.3. Inclusion and exclusion criteria**

All hypertensive patients having the age  $\geq 18$  years were included in the study. Patients who were severely ill and not able to communicate were excluded from the study.

### 3.4. Sample size determination

The sample size was determined using a single population proportion by taking that 27.3% proportion of the patients perform proper dietary practice from previous work (Eyasu S, 2016) with 95% confidence interval and 5% margin of error. Using population correction formula and adding 10% non-response rate the sample size was 356 and calculated as the following:-

$$n = \frac{Z^2 pq}{d^2}$$

Where n = minimum size required for the study.

Z = standard normal deviate.

P = prevalence of hypertension = 27.3% (from a study carried out in southern Ethiopia)

q = 1-p

d = level of accuracy; which is set at 5%.

### 3.5. Sampling technique

Total adult hypertensive follow-up patients were 280 in Addis Zemen primary hospital and 168 in Addis Zemen health care center. Therefore, the total patients registered for follow up in both the hospital and health care center were 448 and the sample size was allocated proportionally. All previously registered 448 patients were included in the sampling frame. Then the study respondents were selected using random sampling technique. The list of patients (sampling frame) was obtained from the registration books of the patients registered

for follow up in the hospital and the health care center then the study subjects were selected by systematic random sampling method.

### **3.6. Variables of the study**

#### **Dependent variable**

The dietary practice of hypertensive patients

#### **Independent variables**

Socio-Economic variables: - Age, sex, income, marital status, educational status, religion, occupation, residence.

Health profile of the patients: - Duration of diagnosis, presence of co-morbidity, family history of hypertension.

### **3.7. Data collection instruments**

The questionnaire had socio-Economic, questions related with knowledge and source of information about dietary practice, question related to work behavior and physical activity and questions about health profile of the patients. The dietary practices were measured using questionnaires adapted from hypertension self-care practice questions which are recommended by joint national committee on detection, prevention evaluation and treatment of hypertension(JNC7) and WHO STEPS questionnaires (JNC,2004 and WHO, 2003).

### **3.8. Measurements**

**Low-salt diet** - 4 items were used to assess practices related to eating a healthy diet, avoiding salt while cooking and eating, and avoiding foods high in salt content. A mean score was

calculated. Scores of 4 or more indicate that patients followed the low-salt diet and considered as having good low salt diet practice.

**Physical activity** - Physical activity was assessed by two items. “How many of the past 7 days did you do at least 30 minutes total of physical activity?” and what you do around the house or as part of your work?” Responses were summed (Range 0–24) patients who scored 12 and above were coded as having a good physical activity practice (physically active). All others coded as poor physical activity.

**Smoking** - Smoking status was assessed with one item, “smoking cigarette in the last 7 days or who do not smoke at all”.

**Dietary practices** -A 7-day food frequency questionnaire (FFQ) was used to obtain information about the number of times different food groups were consumed in the past 7 days. The FFQ was based on foods typically consumed in the locality and grouped in such a way to enable assessment of whether study participants’ intake is in accordance with the DASH dietary pattern.

**Alcohol** - Alcohol intake was assessed using 2-items. Participants who report not drinking any alcoholic drinks at all or who indicated that they usually drink in the last seven days.

**Height** was measured using portable stadiometer without participant wearing shoes to the nearest 0.5 cm. reading was taken after the participant was requested to have feet together heels against the back board, knees straight and look straight forward. In addition, weight to the nearest 0.1 kg. Body mass index (BMI) was calculated from the weight and height. BMI (kg/m<sup>2</sup>) was categorized as normal weight ( $18.5 \leq \text{BMI} < 24$ ), overweight ( $24 \leq \text{BMI} < 28$ ), and obese ( $\text{BMI} \geq 28$ ) using the WHO recommendations (WHO, 2011).

### **3.9. Data collection procedures**

Data was collected by two trained diploma nurses and using face to face interview method. One BSc nurse supervisor was assigned to the hospital and health care center. The socio-demographic, health profiles of participants, knowledge on dietary practice, and source of information of the study participants were collected using an interview based structured questionnaire adapted from the WHO manual and reviewing different literatures (WHO, 2011). Physical characteristics (height, weight, waist and hip circumference) were measured. Dietary practice was measured using Dietary information collected via in-person interview using a food frequency questionnaire (FFQ). The FFQ included food items commonly used in the area. For each food item, participants were asked how frequently (never, once a week, two-three times a week, daily) they consumed the food, followed by a question on amount of consumption.

The dietary practice was classified as a 'healthy dietary practice' and 'un healthy dietary practice'. Respondents were labeled to have "healthy dietary practice" if they scored above the mean in all recommended dietary practice questions.

Weight and height of the patients were measured and BMI was calculated and classified using WHO guideline as normal weight, overweight and obese. Weight and height measurements were taken during data collection.

### **3.10. Operational definition**

**Healthy dietary practice:** -when patients respond the mean or above out of the dietary practice questions ( $\geq 10$  points) from a total of 20 points.

**Un-healthy dietary practice:** - when patients respond below the mean score on the dietary practice questions (<10 points).

**Alcohol:** -related healthy dietary practice in which daily consumption of any alcoholic drinks in the past seven days.

**Salt** related dietary practice is defined as consumption of never or less than 6 g salt per food palate. The metric-measurement system is converted to the equivalent household measurement system (thus never or less than half teaspoon) for data collection.

**Smoking:**-related dietary practice is defined as self-report of never smoked or smoked in the last seven days.

The healthy weight is when the calculated BMI of the individual is within the range of 18.5 and 24.9 from the measured height and weight and the others are unhealthy weight including overweight ( $24 \leq \text{BMI} < 28$ ), and obese ( $\text{BMI} \geq 28$ ).

### **3.11. Data analysis**

Data were checked, cleaned, and fed into Epi-info version 7 software, and then imported to SPSS version 23.0 software for analysis. Incomplete and inconsistent data were excluded from the analysis. Descriptive statistics were used to describe the sample. The results of the descriptive statistics were expressed as percentages and frequencies. Associations between independent and dependent variables were analyzed first using bivariate analysis to identify factors associated with the outcome variable. Those variables which were found to have an association with the outcome variable at  $P < 0.2$  were used in multivariate logistic regression to test for independent association. The magnitude of the association between different independent variables in relation to the dependent was measured using odds ratios, 95% confidence interval (CI) and  $P$ -values  $< 0.05$  were considered to be statistically significant.

### **3.12. Ethical approval and consent to participate**

Ethical approval of the research proposal was obtained from the school of chemical and food engineering Bahir Dar University. The confidentiality paper was obtained from Amhara national regional community health bureau and Addis Zemen primary hospital medical director. Written consent was obtained from the study subjects and an interview was held only with those who gave written consent to participate. The participants could withdraw from the study at any stage.

## **4. RESULTAND DISCUSSION**

### **4.1. Result**

#### **4.1.1. Socio-demographic characteristics**

Out of 359 hypertensive patient participants, 343 participated in the study with 95.5% response rate. Almost half 174(50.6%) of the participants were females. About 67% of study participants were 65 and above years old. The mean age of respondents was 57.6(SD  $\pm$ 15.3). More than half 230 (66.9%) of study participants were married. The educational status of study groups constitute 231 (67.2%) has no formal education, 33(9.6%) were college completed. Considering the employment status, 171(49.7%) were private workers. Orthodox is the predominant religion in the study participants accounting 281(81.7%). While considering their residence area 205(59.6) were urban dwellers. The average monthly income in study participants around 210(61.2%) were greater than1000 ETB (Table 1).



**Table 1: Socio-demographic characteristics of hypertensive patients in Addis Zemen primary hospital and health center Amhara, 2019 (N = 343)**

<b>Variables</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Age</b>		
>65 year	230	67
<65 year	113	33
<b>Sex</b>		
Female	174	50.6
Male	169	49.4
<b>Marital status</b>		
Non married	11	3.2
Married	230	66.9
Divorced	38	11.0
Widowed	64	18.6
<b>Educational status</b>		
No formal education	231	63.7
primary school	55	16.0
secondary school	24	7.0
college complete	33	9.6
<b>Job</b>		
Employed	45	13.1
Private worker	171	49.7
House wife	117	34.1
Non employed	10	2.9
<b>Religion</b>		
Orthodox	281	81.9
Muslim	45	13.1
Protestant	17	5

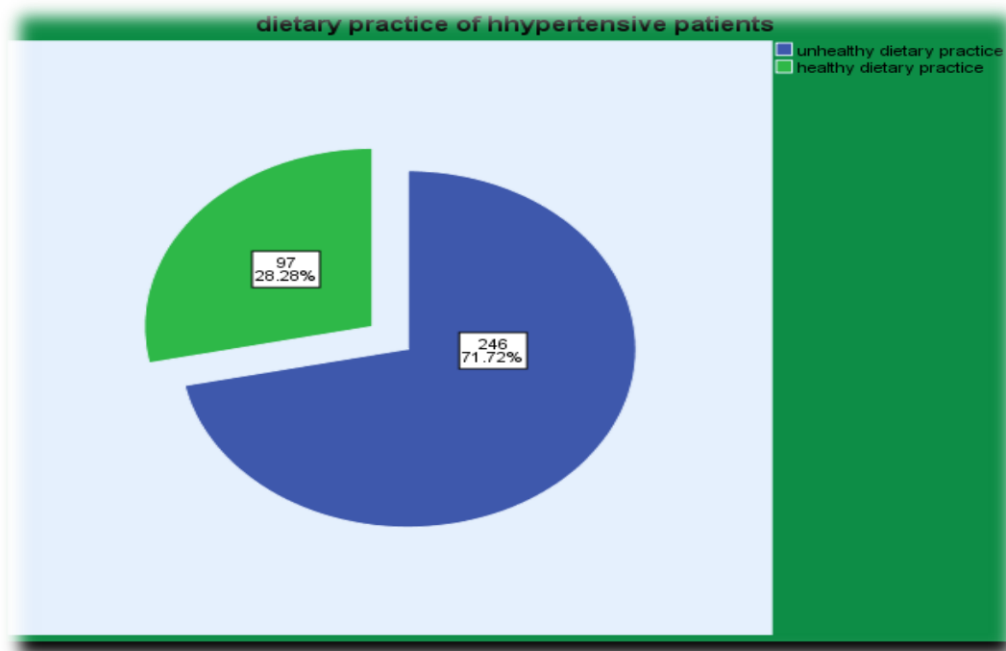
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<b>Residence</b>		
Urban	205	59.9
Rural	138	40.1
<b>Average monthly income</b>		
<500	25	7.3
500-1000	108	31.5
>1000	210	61.2

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#### **4.1.2. Dietary practice and associated factors**

From the total 343 participants only 94(27.4%) hypertensive patients had healthy dietary practice. The mean score for healthy dietary practice was 6.08(SD±3.486) with maximum score of 20. The mean (+SD) score for physical activity was 9.71(±4.82) with the maximum score of 24. From the total of study participants only 34 (9.9%) practiced physical activity for at least 30 min per day. The mean (±SD) score for low salt diet was 3.09(±1.41), from the total 343 patients 156 (45.3%) practiced recommended low diet salt. Two hundred sixty nine (78.2%) did not drink any alcoholic drinks at all in the last 7 days. Twenty six (7.6%) were chat chewers (Table 2).



**Figure 2: Dietary practices of hypertensive patients in Addis Zemen primary hospital and health center, Amhara, 2019 (N = 343)**

**Table 2: Dietary practices of hypertensive patients in Addis Zemen primary hospital and health center, Amhara, 2019 (N = 343)**

Variables	Frequency	Percentage
<b>Fruit consumption</b>		
1-3 times/week	112	91.8
3-5 times/week	10	8.2
5-7 times/ week	0	0
<b>Vegetable consumption</b>		
1-3 times/week	57	25.8
3-5 times/week	102	46.15
5-7 times/week	62	28.05

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**Fat of meat consumption**

Yes	135	39.5
No	208	60.5

**Fish consumption**

Yes	48	14
No	295	86

**Fried food consumption**

Yes	55	15.7
No	289	84.3

**Regular physical exercise 30 min per day (N=343)**

Yes	34	9.6
No	310	90.4

**Practice recommended low salt diet (N = 343)**

Yes	156	45.6
No	187	54.4

**Alcohol consumption**

Yes	74	21.6
No	269	78.4

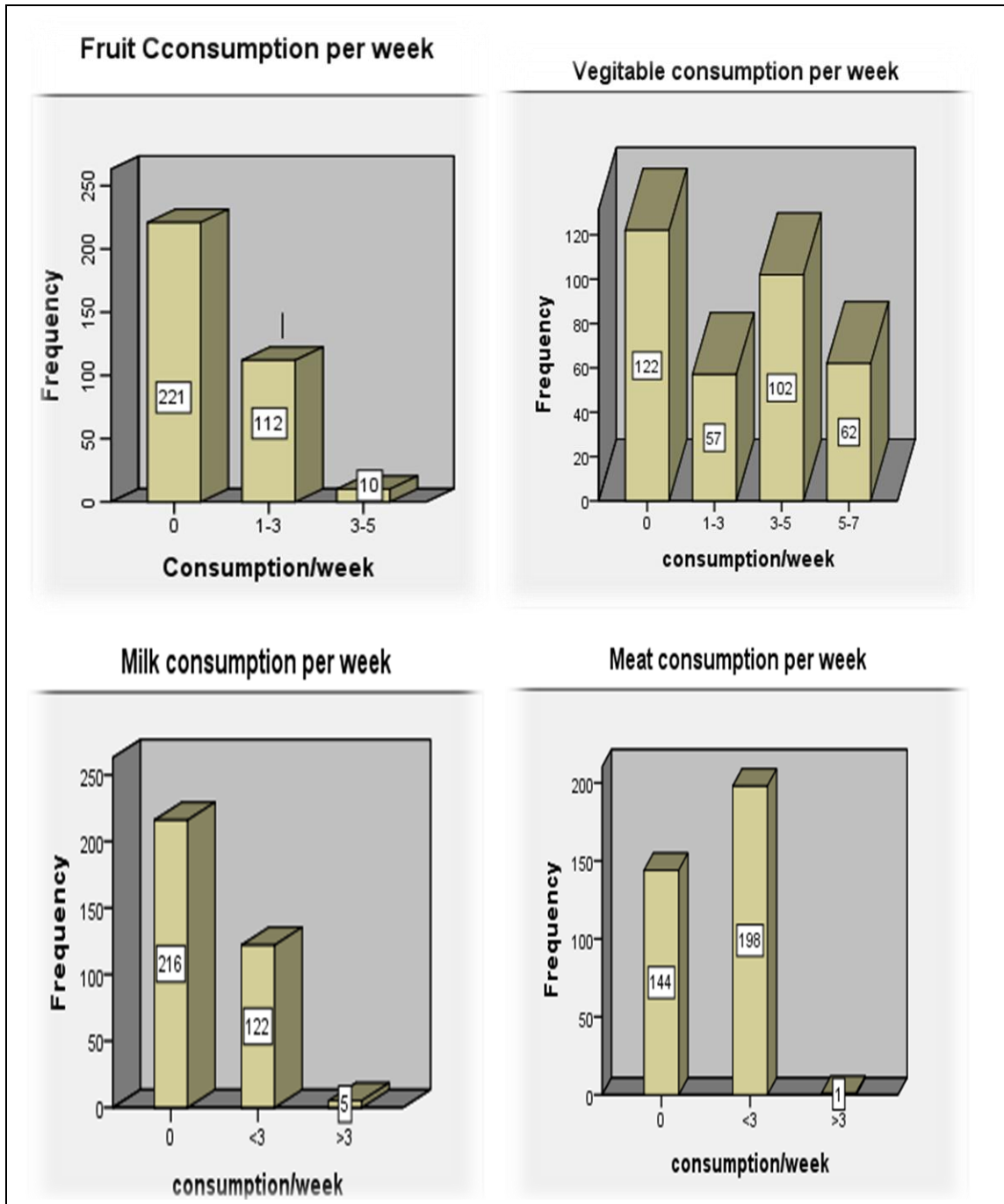
**Chewing khat**

Yes	26	7.6
No	317	92.4

**Smoking**

Yes	5	1.5
No	338	98.3

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**Figure 3: Dietary practices of hypertensive patients in Addis Zemen primary Hospital and health care center, Amhara, 2019 (N=343)**

### 4.1.3. Health profile, individual and source information related factors

From 97 patients who had basic knowledge about recommended dietary practice 63(57.3%) practiced healthy dietary habit and about 52(53.1%) of study participants who were informed about recommended dietary practice by health professionals practiced healthy dietary activity. Study participants those who were in treatment for 2 to 5 years 23(23.7%) practiced healthy dietary habit. From those who had a family history of hypertension 21(44.7%) practiced healthy dietary practice. No participant from obese study subjects practiced healthy dietary activity while 19(48.8%) from overweight hypertensive patients have healthy dietary practice (Table 3).

**Table 3: Health profile, individual and source information related factors among hypertensive patients in Addis Zemen primary hospital and health center, Amhara, 2019 (N = 343)**

Variables	Dietary practice	
	Healthy DP N (%)	Unhealthy DP N (%)
<b>Duration since diagnosis</b>		
<2 years	38(17.4)	180(82.6)
2-5 years	23(23.7)	74(76.3)
5-10 years	7(36.8)	12(63.2)
>10 years	1(11.1)	8(88.9)
<b>Family history of hypertension</b>		
Yes	21(44.7)	26(55.3)
No	59(19.9)	237(80.1)
<b>Body mass index</b>		
<18	25(25.26)	74(74.74)
18-24.9	84(42.2)	115(57.8)
25-29.9	19(48.8)	20(51.2)
>30	0	6(100)

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**Source of information about RDP**

Health professionals	52(53.1)	46(46.9)
Different medias	10(90.9)	1(9.1)

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RDP: Recommended Dietary Practice DP: Dietary Practice N: Total Number of respondents

**4.1.4. Factors associated with dietary practice**

Age, residence area, Marital status, educational status, monthly income, duration of diagnosis, had information about recommended dietary practice, source of information, co-morbidity, body mass index were entered into the final model. According to the result from multivariate analysis age, average monthly income, duration since diagnosis, educational status, residence area were independent predictors of healthy dietary practice among hypertensive patients.

Study participants having >65 years were 67% less likely to practice recommended dietary practice than younger participants (<65 year) (AOR=0.33, 95% CI: 0.14-0.76). Study participants with 5-10 years since diagnosis were 2 times more likely to practice dietary activity (AOR=1.8, 95% CI: 1.3-2.6). Physically inactive study participants were 78% less likely to practice recommended dietary habit than physically active study individuals. Rural dwellers in the study participants were 66% less likely to practice dietary activity than urban residents (AOR=0.34, 95% CI: 0.15-0.78). Study participants having a length of 10 and above years since diagnosis have 1.8 times more likely to practice healthy dietary activity than those who had less than 2 years (AOR=1.8, 95% CI: 1.3-2.6)

## 4.2. Discussion

The study was conducted with the intention to assess dietary practices and associated factors among hypertensive patients. Unhealthy dietary practice is a major modifiable risk factor of hypertension. Foods rich in calories and fat are risk factors of cardiovascular diseases. Diets low in saturated fat, trans-fat and cholesterol decrease the risk of cardiovascular disease by decreasing LDL cholesterol (K Srinath., 2004).

In this study very fewer patients 94(27.4%) had healthy dietary practice indicating majority of patients fallow unhealthy different from recommended dietary activity. This result supported by a study done in Nigeria involving 252 hypertensive patients found that 80% of the patients consumed unhealthy foods (Okwuoni et al. 2014) and a study done in Saudi Arabia indicating that 88.2% of study participants do not follow recommended dietary practice for hypertensive patients. This study finding also lower when compared a study done in Harrar, Bishoftu/Ethiopia and china (Nadewu AN, Daniel D., 2016 and Hong Y., 1994) in which 81.8%, 64.4%and 70% of participants follow recommended dietary practice respectively. This might be due to difference educational back ground of patients and level of awareness about healthy dietary practice and its effect in hypertension prevention and control. They might also gave little consideration for healthy dietary practice in controlling blood pressure as they are in medication and consider it as the only solution for disease control.

Increased consumption of vegetables can cause a decline in diastolic blood pressure. Previous studies have shown an inverse relationship between vegetable consumption and hypertension. In our study, participants who had healthy dietary practice only 186(54.2%)



consume vegetables  $\geq 3$  times/week while 41(12%) consume fruit  $\geq 3$  times/week which is similar with other study findings (Anteneh Z, 2015) and 77(63.8%) participants consume fruits  $\leq 3$  times per week and 100% of participants consume cereals daily, but this finding is lower when compared with other study results conducted in Thailand and Nepal(Ganesh K, 2009 and Archana S., 2012), this might be due to difference in educational back ground of patients and level of awareness about healthy dietary practice and its advantage in prevention and control of hypertension. The other reason may be unless they are in season; most hypertensive patients found fruits to be expensive to buy hence cannot afford to eat fruits on daily basis. As for vegetables, they are priced affordably even when they are off-season, but most individuals have an attitude of not wanting to eat vegetables.

About 48(14%) of respondents were consume fish from this 99.7% were consume  $< 3$  times per week even if there is an access it might be due to poor knowledge about health promoting effect of fish and other related benefits. A systematic review and meta-analysis of elevated blood pressure and consumption of dairy foods showed that consumption of low-fat dairy foods was associated with a 13% reduction in risk of high blood pressure (R.A. Ralston, 2012).The intake of dairy foods, which are good sources of calcium and potassium, was very low among the study participants. Majority of rural study participants use milk and dairy products due better access than urban residents which constitute 87(67.4%). From those who consume milk 122(98.5%) consume  $< 3$  times per week. In this study 199(58%) study participants consume meat and 100% of the study participants consume cereals per day.

The mean (+SD) practice score of low salt diet was 3.09( $\pm 1.46$ ). One hundred eighty seven study subjects (54.4%) have poor low salt diet practice. This finding was supported by study finding done in southern Ethiopia in which 57.5% of participants had poor low salt diet

practice (Buda *et al.*, 2017). But this finding is lower than the finding of a study done in Jimma University Specialized hospital (Ethiopia) which showed that 80% of hypertensive patients practice recommended salt use (Tesema S, 2016). This poor low salt diet practice might be due to the socio-cultural practice of the community and poor knowledge about the effect of high salt diet in blood pressure control. It could be due to the intention of individuals to make the food tastier by adding salt that is common in Africa (Ogedegbe, G., 2014).

**Table 4: Predicators of healthy dietary practice among hypertensive patients in Addis Zemen primary hospital and health center, Amhara, 2019 (N = 343)**

Variable	Dietary practice		COR(95%CI)	AOR(95%CI)	P-value
	Healthy N (%)	Unhealthy N (%)			
Age					
>65 year	73(31.7)	157(68.3)			
<65year	24(21.2)	89(78.8)	0.46(0.27-0.78)*	0.33(0.14-0.76)	0.004
Income					
<500	9(36)	16(64)			
5001-999	18(16.7)	90(83.3)			
>1000	70(33.3)	140(66.7)	1.63(1.1-2.4)*	0.81(0.43-1.52)	0.501
Religion					
Orthodox	55(19.6)	226(80.4)			
Muslim	21(46.7)	24(53.3)			0.009
Protestant	12(70.6)	5(29.4)	4.5 (2.7-7.4)**	2.17(1.2-3.9)	
Marital status					
None	7(63.6)	4(36.4)			
Married	70(30.4)	160(69.6)	0.5(0.37-0.71)**	0.58(0.38-0.88)	0.001
Divorced	7(18.4)	31(81.6)			
Widowed	4(6.2)	60(93.8)			
Duration since diagnosis					
<2 years	38(17.4)	180(82.6)			
2-5 years	23(23.7)	74(76.3)			

5-10 years	7(36.8)	12(63.2)	1.2(0.89-1.64)	1.8(1.3-2.6)	
>10 years	1(11.1)	8(88.9)			0.001
Education					
None	34(14.7)	197(85.3)			
Elementary	20(36.4)	35(63.6)			
High school	10(41.7)	14(58.3)			
College and above	24(72.7)	9(27.3)	1.8(1.55-2.17)**	1.8(1.16-1.75)	0.001
Residence					
Urban	76(37.1)	129(62.9)			
Rural	12(8.7)	126(91.3)	5.8(3.25--985)**	3.15(1.64-6.1)	0.001
Physical activity					
Active	22(66.7)	11(33.3)	5.6(2.6-10.3)**	4(1.6-0-9.6)	0.002
In active	66(21.3)	244(78.7)			

\* < 0.005

\*\* < 0.001

Among individuals who had healthy dietary habit only 34(9.6%) of the participants practiced regular exercise  $\geq 30$  min per day for most of the days in a week which indicate majority of study participants lead sedentary life. Similar study result founded by Okwuoni et al. (2014) in which 87% hypertensive patients had low physical activity levels in Nigeria. Our study result is lower than study done in Addis Ababa (65.1%), Jimma (89%) (Ethiopia) and India (14%), (Hareri HA. 2013, Tesema S., 2016 and Durai V., 2015).

A possible explanation could be lack of organized setups that are favorable for exercise. Another possible explanation could be poor knowledge on the importance of physical activity in the management of hypertension and limitation in creation of awareness about importance of physical activity during their follow up. A similar study done in Saudi Arabia showed that only (11.1%) of patients practiced physical activity most of the days in a week. Another study was done in the USA in African Americans also showed the majority of the patients practiced physical activity that is higher than this study's finding (Warren-Findlow J., 2011).

The study identified that higher age (>65 years) had significant association with healthy dietary practice in hypertensive Patients. Study participants having age above 65 years old were 67% less likely to practice healthy dietary activity than patients having less than 65 years (AOR = 0.33, 95% CI: 0.14-0.76). The result is in line with the study done in China and Saudi Arabia (Elbur AI.2015, Hu H., 2013). This could be due to older persons are less educated, decreased cognitive function and have more co morbidities which may affect to practice recommended dietary activity and other good life style activities for hypertension control.

The result from this study showed that patients having higher educational level (certificate and above) were 1.8 times more likely to practice healthy dietary activity (AOR = 1.8, 95% CI: 1.06-1.52) as compared to those who had no formal education. This is consistent with the study done Nigeria and Botswana in which as educational status increase practice of healthy dietary habit and good life style medication was higher.

Average monthly income has not significantly association with healthy dietary practice in this study (AOR=0.809, 95%CI: 0.43-1.52). This is inconsistent with finding from a study done in Saudi Arabia in which level of monthly income was highly significantly associated with adherence to dietary practice (Elbur AI., 2015).

Study participants living in urban areas had 3 times more likely following up to recommended dietary practice than rural dwellers (AOR=3.15, 95% CI: 1.64-6.1), this might be due to urban dwellers have better education and information about recommended dietary practice and other good life style activities than rural hypertensive patients. This result is in line with a study conducted in china which identifies that rural residents are poor in performing healthy dietary practice and other good life style practices (Hong Y., 2004).

Patients on treatment for 5-10 years were 2 times more likely to practice healthy dietary habit as compared to those patients who were in treatment for less than 2 years(AOR = 2, 95%CI: 1.3-2.6). This finding is supported by different studies done in Saudi Arabia (Elbur AI.2015) and Nigeria (Okwuoni et al., 2014) that show patients on longer duration of treatment had a better awareness about healthy dietary practice. This might be due to repeated counseling, advice and health education from their doctor and other sources creates opportunity for patients to have healthy feeding habit.

### **LIMITATION OF THE STUDY**

The main limitation of this study is lack of adequate similar studies in our country, which made comparison difficult for the lifestyle changes. In addition, the data was self-report from the participants; there may be the denial of poor practices from the respondents, which affects the result of the study.

The study also had other limitations like attitude of study participants towards some food groups, social desirability to some particular food types and market accessibility of foods in the particular study setting.

## 5. CONCLUSION AND RECOMMENDATION

The study founded that 27.4% of respondents practiced healthy dietary activity indicated that majority of respondents had high prevalence of unhealthy eating habits and led relatively inactive or sedentary life style. The factors impeding or enhancing the outcome variables were thoroughly analyzed. Age, residence area, knowledge about recommended dietary practice, physical activity was found to be significantly associated with dietary practice. A high number of participants were unaware about recommended dietary practice and no dietary guide line for hypertensive patients,

- Hypertensive patients need to be encouraged for healthy life style activities in control of hypertension like regular physical exercise, moderation of alcohol and salt consumption and healthy dieting.
- Utilize mass communication channels to promote national and community-based nutrition education.
- Changing long standing eating habits is a gradual process and could be very challenging and difficult for most patients. As such, there is need for continued awareness to hypertensive patients about the importance of changing their eating habits such as diversifying their diets and the need to reduce overconsumption of proteins, carbohydrates and sometimes fats.
- There is strong need to have specific dietary guidelines that are feasible to hypertensive patients and easy to use by all health workers. This could standardize the nutrition advice that is given to hypertensive patients and help to foster good eating habits among hypertensive patients.

## APPENDIX

### Appendix 1: information sheet and informed consent

**Title of the project: Dietary practice and associated factors among hypertensive patients in Addis Zemen primary Hospital and health care center: Northwest Ethiopia**

**Name of investigator:** Suleymnsn Hussien

**Name of the organization:** Bahir Dar University, Institute Of Technology, School Of Chemical And Food Engineering.

**Funding Organization:** Bahir Dar University, Institute of Technology, School of Chemical and Food Engineering faculty of applied human nutrition

**Introduction:** The information sheet and consent form prepared by the investigator with the aim of explaining the research project that you are asked to join by the group of research investigators. The main aim of this research project is to assess the dietary practice and associated factors of hypertensive patients. Decision on your involvement will be made by you and only you. The investigator includes 4 data collectors, 2 supervisors and two advisors from Bahir Dar University.

**Purpose:** to assess the dietary practice and associated factors of hypertensive patients and recommend possible interventions based on the finding.

**Procedure:** To assess Dietary practice and associated factors among hypertensive patients, you are invited to participate in the project. If you are willing to participate in this project you need to understand and sign the agreement form. Then you will be requested to give response to some questions that will take few minutes (about 30 minutes) and then there will be height, weight, hip and waist circumference measurement. All the responses given by you will be kept confidentially by using coding system whereby no one will have access to your response.

**Risk:**

By participating in this study you may feel that it has some discomfort especially on wasting your time (20-30 mints) to respond questions but this may not be too much as you are one of the member of the communities, your response will help as important input to determine the

dietary practice other related factors in hypertensive patients. However there is no physical or psychological risk expected being involved in the study.

**Benefits:** If you participate in this study, you may not gain direct benefit but your participation will help us to assess dietary practice and associated risk factors in the occurrence of hypertension and to take measures based on the finding.

**Confidentiality:** Information about you will be collected without your name but a cod number assigned to it will be stored in a file and kept secured. Your personal information will only be used for the purpose of the study. Your response will be aggregated to yield summary data, but your individual response will not be reported.

**Participation:** You have to know that your participation is largely based on your willingness and approval. There are questions to be answered by you .you are expected to answer all of the questions but you have the right to say “no” and not participate in the study (you can choose not to respond to some or all of the questions). You have also a full right to withdrawal from this study at any time you wish without losing any of your right and without any penalty.

**Person to contact:** This research project will be reviewed and approved by the ethical committee of Bahir Dar University. If you want to know more information and ask any questions at any time you went you can contact with the following address.

1. Prof. Reddy PCJ Prasad Bahir Dar University
2. MR. GIRMA NEGA Bahir Dar University

**Email-sulexhuss@gmail.com**

**Phone No-0920499795**



## Appendix 2: English version of questionnaire

Step 1				
A. Socio demographic Information of Respondent				
No	Questions	Alternative Choices for Response	code	
1	What is your Sex?	1. Male 2. Female	A1	
2	How old are you?(enter number)	.....years	A2	
3	When do you born?	..../..../....Day/Moth/yr(EC)	A3	
4	What is your Religion?	1. Orthodox Christian 2. Protestant 3. Catholic 4. Muslim	A4	
5	What is your Marital status?	1. Never Married (single) 2. Currently Married 3. Divorced 4. Widowed	A5	
6	What is your Education status?	1. No formal schooling 2. Primary school 3. Secondary school 4. College/University completed	A6	
7	Where do you live?	1. Urban 2. Rural	A7	
8	What is your job description?	1. Employed 2. Private worker 3. House wife 4. Non employed	A8	
9	What is your family's total monthly income?	1. ----- Birr 77. Don't know	A9	
10	Do you or any first degree relative* of yours suffer from any chronic disease such as hypertension?	1. Yes 2. No 77. Don't know	A10	
11	If yes to On 11, specify which relative(s) and nature of disease(s)	Relative	Nature of Disease	A11
<b>*A first-degree relative refers to: your actual father/mother (not step-), full brother/sister and full child.</b>				

B. Behaviors risk factors Smoking or Tobacco Use and khat			
12	Do you currently smoke any tobacco product such as cigarettes, cigars, or pipes?	1. Yes, daily 2. Yes, but not daily 3. No, never if no go to B5	B1
13	Do you chew Khat?	1. Yes 2. No, if no go to C1	B2
14	How often do you chew khat?	1. Daily 2. Some times 3. Often	36
C. Alcohol consumption			

15	Have you ever taken any type of alcoholic drink? (Beer, wine, spirit, ,, tella", ,, tej" etc)	1. Yes 2. Yes, but not in the past 12 months 3. No, I have never if no go to D1	C1
16	In the past one month, how frequently have you taken at least one alcoholic <b>drink</b> ? *This refers to one standard drink(1 bottle beer 280 ml,1 glass of wine 120 ml,1 glass of traditional areke)	1. 5 or more days a week 2. 1-4 days a week 3. Less than three days this month 4. Less than every month	C2
17	When you drink alcohol, what is your average consumption at a sitting?	----- (number of drinks)	C3
<b>D. Physical Activity-work</b>			
18	Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like <i>carrying or lifting heavy loads, digging or construction work, cutting fire and other wood</i> for at least 10 minutes continuously?	1. Yes 2. No, if no go to D3	D1
19	In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	-----no of days	D2
20	How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> Hours Min	D3
21	Does your work involve/ or do you do moderate-intensity activity, that causes small increases in breathing or heart rate such as brisk walking <i>or carrying light loads, washing clothes</i> for at least 10 minutes continuously?	1. Yes 2. No	D4
22	In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Number of days <input type="text"/>	D5
23	How much time do you spend doing moderate-intensity activities at work on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> Hours Minutes	D6
<b>E. Travel to and from places</b>			
24	Do you walk or use a bicycle ( <i>pedal cycle</i> ) for at least 10 minutes continuously to get to and from places (to move from place to place)?	1. Yes 2. No	E1
25	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 (to move from place to place)?	Number of days <input type="text"/>	E2
26	How much time do you spend walking or bicycling for travel on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> Hours Minutes	E3
<b>F. Recreational activities</b>			
27	Do you do any vigorous-intensity sports, fitness or recreational ( <i>leisure</i> ) activities that cause large increases in breathing or heart rate like <i>running or football, local dancing</i>	1. Yes 2. No, if no go to F4	F1

	for at least 10 minutes continuously?		
28	In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational ( <i>leisure</i> ) activities?	Number of days <input type="text"/>	F2
29	How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> Hours Minutes	F3
30	Do you do any moderate-intensity sports, fitness or recreational ( <i>leisure</i> ) activities that cause a small increase in breathing or heart rate such as brisk walking, cycling, swimming, volley ball for at least 10 min. continuously?	1. Yes 2. No, if no go to G1	F4
31	In a typical week, on how many days do you do moderate intensity sports, fitness or recreational ( <i>leisure</i> ) activities?	Number of days <input type="text"/>	F5
32	How much time do you spend doing moderate-intensity sports, fitness or recreational ( <i>leisure</i> ) activities on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> Hours Minutes	F6
<b>G. Sedentary behavior</b>			
33	How much time do you usually spend sitting or reclining on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> Hours Minutes	G1
<b>H. Dietary information</b>			
34	In a typical week, on how many days do you eat fruit?	Number of days Don't Know 77 <input type="text"/> If Zero days, go to H3	H4
35	How many servings of fruit do you eat on one of those days? ( 1 medium sized piece of fruit, ½ cup fruit juice, ¼ cup dried fruit, ½ cup fresh, frozen or canned fruit)	Number of servings Don't Know 77 <input type="text"/>	H5
36	In a typical week, on how many days do you eat vegetables?	Number of days Don't Know 77 <input type="text"/> If Zero days, go to I	H6
37	How many servings of vegetables do you eat on one of those days? (1 cup raw, leafy vegetable such as spinach, ½ cup cooked vegetable, ½ cup vegetable juice)	Number of servings Don't know 77 <input type="text"/>	H7
38	In a typical week, on how many days do you eat milk and other dairy products like milk, yogurt...?	Number of days <input type="text"/> If Zero days, go to H3 Don't Know 77	H8
39	How many servings of milk and other dairy products do you eat on one of those days?( 1 cup milk, 1 cup yogurt, 1 ½ oz cheese)	Number of servings <input type="text"/> Don't Know77	H9

40	In a typical week, on how many days do you cereals?	Number of days <input type="text"/> <input type="text"/> If Zero days, go to H3 Don't Know 77	H10
41	How many servings of cereals do you eat on one of those days? (1 slice bread , ½ cup cooked rice, pasta, cereal)	Number of servings <input type="text"/> <input type="text"/> Don't Know77	H11
42	In a typical week, on how many days do you meat, poultry and fish?	Number of days <input type="text"/> <input type="text"/> If Zero days, go to H3 Don't Know 77	H12
43	How many servings of meat, poultry and fish eat on one of those days? (3 oz cooked meat, poultry or fish).	Number of servings <input type="text"/> <input type="text"/> Don't Know77	H13
<b>I. Dietary salt</b>			<b>I</b>
44	How often do you add salt or a salty sauce such as soy sauce to your food right before you eat it or as you are eating it?	1. Always 2. Often 3. Sometimes 4. Never 77. Don't know	I1
45	How often is salt, salty seasoning or a salty sauce added in cooking or preparing foods in your household?	1. Always 2. Often 3. Sometimes 4. Never 77. Don't know	I2
46	How often do you eat processed food high in salt?, such as packaged salty snacks, canned salty food including pickles and preserves, salty food prepared at a fast food restaurant, cheese, bacon	1. Always 2. Often 3. Sometimes 4. Never 77. Don't know	I3
47	How much salt or salty sauce do you think you consume?	1. Far too much 2. Too much 3. Just the right amount 4. Too little 77. Don't know	I4
<b>Step 2. Physical Measurements</b>			<b>J</b>
48	Height (measured 2 times)	-----cm	J1
49	Weight (kg)	-----Kg	J2

**Thank you for your participation!!!**

**Identification**

Identification number of the respondent \_\_\_\_\_

Name of data collector \_\_\_\_\_ signature \_\_\_\_\_

Name of Supervisor \_\_\_\_\_ signature \_\_\_\_\_

Date of data collection \_\_\_\_\_ / \_\_\_\_\_

**Appendix 3: information sheet and informed consent Amharic version**

**የመረጃና የስምምነት ፎርም**

**የምርምር ፕሮጀክቱ ርዕስ:**

በአማራ ብሄራዊ ክልላዊ መንግስት በደቡብ ጎንደር ክልል ተዳደር ዞን በአዲስ ዘመን የመጀመሪያ ደረጃ ሆስፒታል የደም ጤና ምርመራ ስርዓት ለማረጋገጥ የሚያደርጉ ሰዎች ያላቸውን የስነምግብ ሁኔታ እና ተያያዥነታቸውን መዳሰስ

**የዋናው ተመራማሪው ስም: ሱላይማን ሁሴን**

**የድርጅቱ ስም:** በባህር ዳርዩ ንብርሰቲ ቴክኖሎጂ ንስቲት ወትኬ ሚካል እና ምግብ ምህንድስና ትምህርት ቤት

**ወጪውን የሚሸፍነው:** በባህር ዳርዩ ንብርሰቲ

**መግቢያ:**

ይህ የመረጃና የስምምነት ቅጽ የተዘጋጀው ለአላማኒ ምርምር ፕሮጀክቱ እና ለሌሎች ምርመራዎች ለማረጋገጥ ነው።

የፕሮጀክቱ ስም አላማኒ ምርምር ፕሮጀክቱ በደቡብ ጎንደር ክልል ዘመን የመጀመሪያ ደረጃ ሆስፒታል የደም ጤና ምርመራ ስርዓት ለማረጋገጥ የሚያደርጉ ሰዎች ያላቸውን የስነምግብ ሁኔታ እና ተያያዥነታቸውን መዳሰስ ሆኖ ተገምግሞ ለመሰማራት ይሆናል።

ይህ አጥኝ ስርዓት ለሌሎች ምርመራዎች ለማረጋገጥ ነው።

ሁለት የባህር ዳርዩ ንብርሰቲ መምህራን በሚሰጡት ምርመራዎች ያሳተቡ ናቸው።

**የጥናት ፕሮጀክቱ የሚካሄድበት ምክንያት**

**የጥናቱ ዋና አላማ:**

በአማራ ብሄራዊ ክልላዊ መንግስት በደቡብ ጎንደር ክልል ዘመን የመጀመሪያ ደረጃ ሆስፒታል የደም ጤና ምርመራ ስርዓት ለማረጋገጥ የሚያደርጉ ሰዎች ያላቸውን የስነምግብ ሁኔታ እና ተያያዥነታቸውን ማረጋገጥ ሲሆን ሌሎች ምርመራዎች ለማረጋገጥ ይሆናሉ።

**አተገባበር:**

የደም ጤና ምርመራ ስርዓት ለማረጋገጥ የሚያደርጉ ሰዎች ያላቸውን የስነምግብ ሁኔታ እና ተያያዥነታቸውን ለማረጋገጥ እርስዎን ለማረጋገጥ ይሆናል።

በፕሮጀክቱ ለመሳተፍ ፈቃደኛ ከሆኑ ወሎ ሊገባዎት ይችላል።

ከዚያም በመረጃ ሰጪዎች ጥቂት ደቂቃዎች (ሰዓት) ለሚወስዱ ጥያቄዎች መልስ እንዲሰጡ በአክብሮት ይጠየቃል።

ሉ፣ የቁመት፣ የክብደት፣ ልኬትም ይደረግሎታል።

ለእያንዳንዱ ጥያቄ ለሚሰጡት ምላሽ ማንም ሰማያዊ ገዥው መለያ ቁጥር ሚስጥራዊነቱን ተጠብቆ ይሆናል።

**ሊገጥም የሚችል ችግር/አለመመቻት፡**

በዚህ ጥናት በመሳተፍ ያመጡ ነፍሳዊ አለመመቻት ማለት ምን ስለሆነው በክንት (30 ደቂቃዎች) ሊሰማዎት ይችላል።  
ቢሆንም ግንዛቤ ህብረተሰቡ አካል እንደ መሆኖ መጠንና የሚሰጡት መረጃ የደም ግፊት ህክምናን የሚከታተሉ ሰዎች  
ንግድ ስለሚገቡ ለእናተ ያያዥ ነገሮች ንግድ ጥናት እንደ ግብአት ስለሚጠቅም የሚያጠፉት ጊዜ በዙላይ ሆን ይችላል።  
ስለሆነም በምርምር ፕሮጀክቱ በመካፈል ያለው የሚደርስ ብዙ አካላዊ ምሆን ስለሌለውና የሚታወቁ ችግሮች ለምን።

**ጥቅሞች፡** ከዚህ ጥናት እርስዎ በቀጥታ ተጠቃሚ ላይ ሆኑ ይችላሉ ነገር ግን የእርሶ መሳተፍ የደም ግፊት ታማሚ  
ዎች የስነ ምግብ እና ተያያዥ ነገሮች ንግድ ጥናት እና በጥናቱ ውጤት መሰረት በሽታው ንግድ ለሌሎች እና ለመቋቋ  
ም የሚያስችሉ ምርጫዎች ያመለክታሉ።

**ስለተሳትፎ፡** በጥናቱ ለመሳተፍ ያለው ሰው ልዩ ልዩ ቃዳ እንደሆነው ለሚጠየቁት ጥያቄዎች ሁሉ ይመልሱ ለብ  
ዬ ተስፋ አደርጋለሁ ነገር ግን ከሚጠየቁት ጥያቄዎች ለተወሰኑት አሊያ ለሁሉም መልስ ያለመስጠት አለዎ  
ት። እንዲሁም ያለምንም ቅጣትና መብት መንደር በፈለጉ ሰዓት ጥናቱን የማቋረጥ ሁሉ መብት አለዎት።

**ረጅም ላይ፡** ይህ የምርምር ፕሮጀክት በባህር ዳርዩ ንብርስ ቴታር ሞና ተከልሶ ይጸድቃል።

ተጨማሪ መረጃ ስለ ለግዎትና ማንኛውንም ጥያቄ በማንኛውም ሰዓትና ጊዜ መጠየቅ ከፈለጉ በሚከተሉት አድራ  
ሻዎች የፈለጉትን አካል ማነጋገር ይችላሉ።

- 1. ፕ/ር ፕራሳድ፡ ከባህር ዳርዩ ንብርስ ቴታር ሞና ተከልሶ 09 18 16 82 75 98
- 2. አቶ ግርማነጋ፡ ከባህር ዳርዩ ንብርስ ቴታር ሞና ተከልሶ 09 18 71 39 52

ኢ-ሜል [sulexhuss@gmail.com](mailto:sulexhuss@gmail.com)

በጥናቱ ተሳታፊ ለመሆን ቃዳ ያደኛኛት

አዎ \_\_\_\_\_ አዎ ከሆነ ይቀጥሉ

አይደለም \_\_\_\_\_ አመስግነው ወደ ሚቀጥለው ተሳታፊ ይሂዱ.

## Appendix 4: Amharic version of questionnaire

### ለደምግፊት ታማሚዎች የተዘጋጀ መጠይቅ

ተ/ቁ	የጥያቄው አይነት	አማራጭ መልስ	ኮድ
<b>ማህበራዊና ስነ ህዝብ ሁኔታ</b>			
1	የታዎምን ድንገት?	1. ወንድ 2. ሴት	1
2	እድሜዎ ስንት ነው?	_____ ዓመት	2
3	የተወለዱት መቸኑ?	_____ ቀን _____ ወር _____ ዓ/ም	3
4	የሚከተሉት ሀይማኖት ምን ድንገት ነው?	1. ሙስሊም 2. ኦርቶዶክስ 3. ፕሮቴስታንት 4. ካቶሊክ	4
6	የጋብቻ ሁኔታዎ እንዴት ነው?	1. ያላገባ 2. ያገባ 3. የተፋታ 4. ሚስቱ/ባሉ ዋና ተቆይታ/ባት	5
7	የትምህርት ደረጃዎ ምን ይመስላል?	1. ዘመናዊት ምህርት ያልተማረ 2. የመጀመሪያ ደረጃ 3. ሁለተኛ ደረጃ 4. የንበርሲ.ቲ/ኮሌጅ ያጠናቀቀ	6
8	በአሁኑ ጊዜ ስራዎ ምን ድንገት ነው?	1. ተቀጣሪ 2. የግል ስራ 3. የቤት አመቤት 4. ስራ ፈላጊ	7
9	መኖሪያ ቦታዎ የት ነው?	1. ከተማ 2. ገጠር	8
10	የቤተሰብ ዎ የወር ገቢ በአማካኝ ስንት ነው?	1. _____ ብር 2. አይታወቅም	9
11	የደምግፊት ተጠቂ መሆንዎን መቻላዎቹ ስንት አመት ምንበር?	በ _____ በ _____ ዓ መቱ	10
12	ከቤተሰብ ዎ ውስጥ የደምግፊት ወይም የስክራታ ማሟላት?	1. አለ 2. የለም 3. አላውቅም	11
13	መልስ ያለ አስሁን ያላችሁ የዝምድና ሁኔታ እና በሽታውን ይግለጹ?	የዝምድና ሁኔታ      የበሽታው አይነት	12
<b>ግላዊ ባህሪን የሚመለከቱ</b>			
14	ባሁኑ ጊዜ የትምህርት ምርቶችን (ለምሳሌ ሲጋራ፣ ፒፓ፣ ሽሻወዘተ) ይጠቀማሉ?	1. አዎ በየቀኑ 2. አዎ አልፎ አልፎ 3. በጭራሽ አልጠቀምም	1
18	ጫት ይቅማሉ?	1. አዎ እቅማለሁ 2. በጭራሽ አልጠቀምም	5

19	መልሰዎአዎከሆነሙሽሙሽነውጫትየሚቅሙት?	1. ሁልጊዜ 2. አንድአንድጊዜ 3. አልፎአልፎ	6
20	የአልኮልመጠጥ(ለምሳሌቢራ፤ውስኪ፤ወይን፤ጠላ፤ጠጅወዘተ) ጠጥተውያውቃሉ?	1. አዎ 2. አዎግንካለፈው 1 ዓመትበፊት 3. በጭራሽጠጥቸአላውቅም	7
21	ባለፈው 1 ወርቢያንስአንድየአልኮልመጠጥበምንያህልጊዜይጠጣሉ (1 ያልኮሎ መጠጥ 1 ጠርሙስቢራ፤ 1 ብርጭቆወይን፤ 1 መለኪያውስኪ፤አረቂ?)	1. በሳምንት 5/በላይቀናት 2. በሳምንት 1-4 ቀናት 3. በወርበ3 ቀናትበታች 4. በወርከ1 ጊዜበታች	8
22	አልኮልበሚጠጡበትጊዜበአማካኝበአንድጊዜምንያህልይጠጣሉ?	_____ መጠጥ	9
<b>የአካል-ብቃት እንቅስቃሴ ለ</b>			
24	የአለትተአለትስራ-ዎከባድጉልበትየሚጠይቅየልብምትንበከፍተኛመጠንየሚጨምሩ (ለምሳሌከባድሽከምመሽከም፤ቆፋሮ፤የግንባታስራ፤እንጨትመቁረጥወዘተ) ያለማቋረጥቢያንስለ10 ደቂቃይሰራሉ?	1. አዎ 2. አልሰራም	1
25	መልሰዎአዎከሆነይህንንአይነትስራ-በሳምንትለምንያህልቀናትየአለትስራ-ዎአካልአድርገውይሰራሉ?	_____ ቀናት	2
26	መልሰዎአዎከሆነይህንንአይነትስራ-በቀንውስጥለምንያህልሰዓታትይሰራሉ?	ሰዓት : ደቂቃ <input type="text"/> : <input type="text"/> ሰዓት ደቂቃ	3
27	የአለትተአለትስራ-ዎመጠነኛጉልበትየሚጠይቅየልብምትንበከፍተኛመጠንየሚጨምሩ (ለምሳሌፈጣንአርምጃ፤ቀላልአቃመሽከም፤ልብስማጠብወዘተ) ያለማቋረጥቢያንስለ10 ደቂቃይሰራሉ?	1. አዎ 2. አልሰራም	4
28	መልሰዎአዎከሆነይህንንአይነትስራ-በሳምንትለምንያህልቀናትየአለትስራ-ዎአካልአድርገውይሰራሉ?	_____ ቀናት	5
29	መልሰዎአዎከሆነይህንንአይነትስራ-በቀንውስጥለምንያህልሰዓታትይሰራሉ?	ሰዓት : ደቂቃ <input type="text"/> : <input type="text"/> ሰዓት ደቂቃ	6
30	አንድቦታለመሄድወይምከቦታቦታሲንቀሳቀሱያለማቋረጥቢያንስለ10 ደቂቃበእግርዎወይምበብስኬሌትጉዞያደርጋሉ?	1. አዎ 2. አላደርግም	7
31	የልብምትንበከፍተኛመጠንየሚጨምሩ-ከባድየአካል-ብቃት እናየመዘናኛ(የትርፍጊዜ) እንቅስቃሴዎችን(ለምሳሌሩጫ/እግርኳስጨዋታ፤ባህላዊጭፈራወዘተ) ያለማቋረጥቢያንስለ10 ደቂቃያደርጋሉ?	1. አዎ 2. አልሰራም	8
32	መልሰዎአዎከሆነይህንንአይነትእንቅስቃሴበሳምንትለምንያህልቀናትያደርጋሉ?	_____ ቀናት	9
33	መልሰዎአዎከሆነይህንንአይነትእንቅስቃሴበቀንውስጥለምንያህልሰዓታትያደርጋሉ?	ሰዓት : ደቂቃ <input type="text"/> : <input type="text"/> ሰዓት ደቂቃ	10
34	የልብምትንበመካከለኛመጠንየሚጨምሩ-መጠነኛየአካል-ብቃት እናየመዘናኛ(የትርፍጊዜ) እንቅስቃሴዎችን(ለምሳሌፈጣንአርምጃ፤ብስኬትመጋለብ፤መዋኘት፤ የእጅኳስጨዋታወዘተ) ያለማቋረጥቢያንስለ10 ደቂቃያደርጋሉ?	1. አዎ 2. አላደርግም	11
35	መልሰዎአዎከሆነይህንንአይነትእንቅስቃሴበሳምንትለምንያህልቀናትያደርጋሉ?	_____ ቀናት	12
36	መልሰዎአዎከሆነይህንንአይነትእንቅስቃሴበቀንውስጥለምንያህልሰዓታትያደርጋሉ?	ሰዓት : ደቂቃ <input type="text"/> : <input type="text"/> ሰዓት ደቂቃ	13



37	በቀንውስጥ በመቀመጥ ወይም በመተኛት ምን ያህል ጊዜ ያሳልፋሉ?	_____ ሰዓታት	14
<b>የአመጋገብ ሁኔታ</b> <span style="float: right;"><b>መ</b></span>			
43	በሳምንት ለምን ያህል ቀናት ፍራፍሬ ይመጣሉ?	_____ ቀናት (ከልተመገቡ የሚቀጥለውን ጥያቄ ይዘሉ)	5
44	በነዚህ ቀናት ምን ያህል መጠን ፍራፍሬ ይመጣሉ? (ሙዝ፣ በርቴካን፣ አፕል 1 መካከለኛ መጠን፣ ጭማቂ 1/2 ብርጭቆ)	_____ መጠን	6
45	በሳምንት ለምን ያህል ቀናት አትክልት ይመጣሉ?	_____ ቀናት (ከልተመገቡ የሚቀጥለውን ጥያቄ ይዘሉ)	7
46	በነዚህ ቀናት ምን ያህል መጠን አትክልት ይመጣሉ? (ትኩስ ቅጠላ ቅጠል 1 ብርጭቆ፣ የበሰለ/የተከተፈ ተማቲ ምግብ፣ አንኩርት፣ ካሮት፣ ጎማን 1 ብርጭቆ)	_____ መጠን	8
47	በሳምንት በአማካኝ ምን ያህል ወተት እና የወተት ተዋፅኦ (ለምሳሌ ወተት፣ እርጎ፣ አይብወዘተ) ይመጣሉ?	_____ ቀናት (ከልተመገቡ ተከታዮችን ጥያቄ ይዘሉ)	9
48	በነዚህ ቀናት ምን ያህል ከብዳ ወተት እና የወተት ተዋፅኦ ይመጣሉ?	_____ ብርጭቆ	10
49	በሳምንት በአማካኝ ምን ያህል ቀናት ጥራጥሬ ይመጣሉ?	_____ ቀናት (ከልተመገቡ ተከታዮችን ጥያቄ ይዘሉ)	11
50	በነዚህ ቀናት ምን ያህል መጠን ጥራጥሬ ይመጣሉ? (1 ቁራሽ ዳቦ፣ 1 ከብዳ ጥራጥሬ፣ 1/2 ከብዳ የበሰለ ፍዝ፣ ፓስታ፣ ጥራጥሬ)	----- መጠን	12
51	ምግብ ከመመገብ በፊት ወይም እየተመገቡ ጨው እና ጨው የበዛበት ስንት (ማጣፈጫ) የሚጨመሩት መቸመቻዎቻቸው?	1. ሁል ጊዜ 2. አብዛኛው ጊዜ 3. አልፎ አልፎ 4. አንድ አንድ ጊዜ 5. በጭራሽ አልመገብም 77. አላውቅም	13
52	ምግብ ሲበስል ወይም ሲዘጋጅ ጨው ወይም ጨው የበዛበት ስንት (ማጣፈጫ) የሚጨመረው መቸመቻዎቻቸው?	1. ሁል ጊዜ 2. አብዛኛው ጊዜ 3. አልፎ አልፎ 4. በጭራሽ አልመገብም 77. አላውቅም	14
53	የጨው ይዘታቸው ከፍተኛ የሆኑ የተዘጋጁ ምግቦች (ለምሳሌ በቆርቆሮ የታሸጉ ጨዋ ምግቦች፣ የተጠበሱ ምግቦች (ችፕስ፣ በምቦሊኖ)፣ ቶሎ የሚደርሱ ጨው የበዛባቸው የሬስቶራንት ምግቦች (ፒዛ፣ በርገር) የመሳሰሉትን መቸመቻ ይመጣሉ?)	1. ሁል ጊዜ 2. አብዛኛው ጊዜ 3. አልፎ አልፎ 4. በጭራሽ አልመገብም 77. አላውቅም	15
54	ምን ያህል መጠን ጨው አጠቃላይ ሁብለው ያስገባሉ?	1. እጅግ በጣም በዙ 2. በጣም በዙ 3. ልክኛ 4. በጣም ትንሽ 77. አላውቅም	16
<b>አካላዊ ሁኔታዎች</b>			
58	ክብደት	_____ ኪ/ግ	1
59	ቁመት	_____ ሴ/ሜ	2

## APPENDIX 5: food frequency questionnaire

Food type	Amount	Frequency of consumption in a week				
<b>Fruits</b> Fresh orange, banana, apple, Mango, grape fruit, avocado Fruit juice		Never	1 per week	2-3 per week	4-5 per week	Every day
<b>Vegetables</b> Fresh green vegetables (lettuce, broccoli, carrot, cabbage)						
<b>Cereals</b> Oat, bread, rice, pasta, biscuits						
<b>Milk and dairy products</b> Milk yogurt cheese butter						
<b>Meat and fish</b> Beef, pork or lamb Chicken, beckon fish						
<b>Beverages</b> beer(heavy and low alcohol wine( red and white)						

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Gereta Setu



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Research & PG & Community  
Service Coordinator