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# NUTRITIONAL STATUS AND ITS ASSOCIATED FACTORS AMONG ADULT EPLIPTIC PATIENTS AT PUBLIC HOSPITALS IN BAHIR DAR CITY, NORTH WEST, ETHIOPIA, 2024.

TAMIRU, MASTEWAL

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**BAHIR DAR UNIVERSITY**

**COLLEGE OF MEDICINE AND HEALTH SCIENCES**

**SCHOOL OF PUBLIC HEALTH**

**DEPARTMENT OF NUTRITION AND DIETETICS**

# NUTRITIONAL STATUS AND ITS ASSOCIATED FACTORS AMONG ADULT EPILEPTIC PATIENTS AT PUBLIC HOSPITALS IN BAHIR DAR CITY, NORTH WEST ETHIOPIA 2024

**BY: MASTEWAL TAMIRU (BSC)**

**A RESEARCH THESIS SUBMITTED TO DEPARTMENT OF NUTRITION AND DIETETICS, SCHOOL OF PUBLIC HEALTH, COLLEGE OF MEDICINE AND HEALTH SCIENCES, BAHIR DAR UNIVERSITY FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN PUBLIC HEALTH NUTRITION.**

**JULY, 2024**

**Bahir Dar University**

**BAHIR DAR UNIVERSITY**
**COLLEGE OF MEDICINE AND HEALTH SCIENCES**
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**Bahir Dar University**

# BAHIR DAR UNIVERSITY
# COLLEGE OF MEDICINE AND HEALTH SCIENCES
# SCHOOL OF PUBLIC HEALTH
# DEPARTMENT OF NUTRITION AND DIETETICS

## DECLARATION

This is to certify that the thesis entitles" nutritional status and its associated factors among adult epileptic patients at public hospitals in Bahir Dar city, north west Ethiopia'' submitted in partial fulfillment of the requirements for the degree of master of public health nutrition in department of nutrition and dietetics ,school of public health, College of medicine and health science Bahir Dar university, is a record of original work carried out by me and has never been submitted to this or any other institution to get any other degree or certificates. The assistance and help I received during the course of this investigation have been duly acknowledged.

| Name of investigator | Signature | Date |
|---|---|---|
| 1.Mastewal Tamiru | | 25/07/2024 |

# BAHIR DAR UNIVERSITY

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# DEPARTMENT OF NUTRITION AND DIETETICS

## APPROVAL OF THESIS DEFENSE

I hereby certify that I have supervised, read, and evaluated this thesis titled" nutritional status and its associated factors among adult epileptic patients at public hospitals in Bahir Dar city, north west Ethiopia'' prepared under my guidance. I recommend the thesis be submitted for oral defense.

| Name of Advisor(S) | Signature | Date |
|---|---|---|
| 1 Omer Seid(MPH, PhD fellow, Associate Professor) | ---------- | ---------- |
| 2 Mis Genet Endalk(MSc) | ---------- | ---------- |

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# ACRONYMS AND ABBERVATIONS

| | |
|---|---|
| APH | Addis alem Primary hospital |
| AOR | Adjusted Odds Ratio |
| AEDS | Anti Epileptic Dregs |
| APHI | Amhara public health institute |
| BMI | Body Mass Index |
| DALYs | Disability Adjusted Life Years |
| DDS | Datary Diversity Score |
| ETB | Ethiopian Birr |
| FANTA | food and nutrition technical assistance |
| FHCSH | Felege Hiot Comprehensive Specialised Hospital |
| GPAQ | Global Physical Activity Questioner |
| HDDS | Household Dietary Diversity Score |
| HFIAS | Household Food Insecurity Access Scale |
| HMIS | Health management Information System |
| MET | Metabolic Equivalent Tasks |
| OPD | Outpatient Department |
| SPSS | Statistical Package for Social Science |
| WHO | World Health Organization |

# TABLE OF CONTENTS

DECLARATION ..... ii

APPROVAL OF THESIS DEFENSE ..... iii

ACKNOWLEDGMENTS ..... iv

ACRONYMS AND ABBERVATIONS ..... v

TABLE OF CONTENTS ..... vi

LIST OF TABLES ..... ix

LIST OF FIGURES ..... x

1. INTRODUCTION ..... 1

1.1 Background ..... 1

1.2 statement of the problem ..... 2

1.3 significance of the study ..... 4

2. LITERATUR RIVIEW ..... 5

2.1 Magnitude of nutritional status of Epileptic patients ..... 5

2.2 Factors of contributing for nutrition status of Epileptic patients ..... 5

2.2.1 Socio-demographic and socio-economic related factors ..... 6

2.2.2 Health related factors ..... 6

2.2.3 Dietary related factors ..... 6

2.2.4 Life style factors ..... 7

2.3 CONCEPTUAL FRAME WORK ..... 8

3. OBJECTIVES ..... 9

3.1 General Objective ..... 9

3.2 Specific objective ..... 9

4. METHODS AND MATERIALS ..... 10

4.1 Study area and period ..... 10

4.2 Study design ..... 10

4.3 Population ..... 10

4.3.1 Source population ..... 10

4.3.2 Study population ..... 10

4.4 Eligibility criteria ..... 10

4.5 Sample size determination ..... 11
4.6 Sampling Techniques and procedures ..... 12
4.7 Study Variables ..... 13
4.7.1 Dependent variable ..... 13
4.7.2 Independent variables ..... 13
4.8 Operational definitions and term definition ..... 13
4.9 Data collection procedures and variables measurement ..... 15
4.10 Data Quality Control mechanisms ..... 15
4.11 Data processing and analysis ..... 16
4.12 Ethical Considerations ..... 17
4.13 Dissemination of Results ..... 17
5. RESULT ..... 18
5.1 Sociodemographic and Economic Characteristics of Epileptic patients ..... 18
5.2 Feeding habits among epileptic patients ..... 19
5.3 Diteary diversity score ..... 19
5.4 Household food insecurity scale (HFIAS) among epileptic patients ..... 20
5.5 Clinical characteristics of epileptic patients ..... 21
5.6 Social support and Behavior characteristics of epileptic patients ..... 22
5.7 Prevalence of nutritional status of epileptic patients ..... 23
5.8 Factors Associated with Nutritional Status of Epileptic Patients. ..... 24
6. DISCUSSION ..... 26
7. STRENGTH AND LIMITATION OF THE STUDY ..... 29
7.1 Strength of the study ..... 29
7.2 Limitation of the study ..... 29
8. CONCLUSION ..... 30
9. RECOMMENDATION ..... 31
10. REFERENCE ..... 32
11. APPENDI X ..... 39
11.1 Appendix1 ..... 39
11.1.1 Participant information sheet (English Version) ..... 39

11.1.2 Informed consent (English Version) ..... 40
11.1.3 Questionnaire (English version) ..... 42
11 .2 Appendix2 ..... 51
11.2.1 Participants information sheet(Amharic version) ..... 51
11.2.2 Consent form sheet(Amharic version) ..... 52
11.2.3 Questionnaire (Amharic Version) ..... 53

# LIST OF TABLES

Table 1 Sample size determination using factors affecting nutritional status of epileptic patients in public hospitals of Bahir Dar city, 2024. ..... 11

Table 1 Sociodemographic and economic characteristics of epileptic patients in Public hospitals of Bahir Dar city, Northwest Ethiopia, July 2024 (n=409). ..... 18

Table 2: Dietary diversity and feeding habits of epileptic patients in Public hospitals of Bahir Dar city, Northwest Ethiopia, July 2024 (*n* = 409) ..... 19

Table 3: household food insecurity scale (HFAIS) distributions among epileptic patients attending at public hospitals in Bahir Dar City, Northwest Ethiopia. ..... 20

Table 4: clinical characteristics of epileptic patients attending at public hospitals of in Bahir Dar city, northwest Ethiopia, July,2024 ..... 21

Table 5 Distribution of ssocial support and Behavior among epileptic patients attending in public hospitals of Bahir Dar city, Northwest Ethiopia, July 2024 (n=409) ..... 22

Table 6: Table: Factors associated with nutritional status of adult epileptic patients attending OPD of Bahir Dar public hospitals, Northwest Ethiopia, July, 2024 ..... 25

# LIST OF FIGURES

Figure 1: Conceptual framework for nutritional status among adult epileptic patients in Bahir dar city, Northwest, Ethiopia, 2024 ..... 8

Figure 2: Schematic presentation showing sampling procedures in Bahir Dar, Northwest Ethiopia, 2024. ..... 12

Figure 3 food groups consumption pattern among epileptic patients in Bahir dar public hospitals, Northwest Ethiopia,July, 2024 ..... 20

Figure 4 : prevalence of nutritional status of epileptic adult patients who were attending public hospitals in Bahir dar city, northwest Ethiopia, July 2024. ..... 23

# ABSTRACT

**Back ground:** Epilepsy can have a significant impact on an individual's daily life. The social and psychological aspects of living with epilepsy may contribute to suboptimal nutritional status. Globally, poor nutritional of epileptic patients is the public health concern, but still there is insufficient evidence in developing countries including Ethiopia.

**Objective:** To assess the nutritional status and its associated factors among adult epileptic patients at public hospitals in Bahir Dar city, Northwest Ethiopia,2024.

**Methods:** A cross-sectional study design was conducted among 409 consecuitive sampling thecniques used for adult epileptic patients from May 20/2024 to June 20/2024 at public hospitals in Bahir Dar city Northwest Ethiopia. Data were collected by using interviewer-administered structured questionnaire and outcome variable was assessed in BMI. Data were entered to epi-data version 4.6 and exported to SPSS software version 26 for analysis. Multinomial logistic regression analysis was performed to identify factors associated with nutritional status of epileptic patient. The adjusted odds ratio with 95% confidence interval was used to measure the strength of association.

**Result:** The prevalence of undernutrition and over nutrition epileptic patients was 34.5% (95% CI: 30.0%, 39.2%) and 15.1 % (95% CI: 11.9%, 19.01%), respectively. Illiterate educationall status (AOR: 2.15; 95% CI: 1.25, 3.69), single marital status (AOR= 2.29; 95% CI: 1.22, 4.32), and less than or equal to 4850 ETB monthly income (AOR=2.02, 95% CI: 1.26, 3.24) were factors associated with undernutrition whereas, frequency of meal greater than and equals to 3 times/day (AOR=4.75; 95% CI: 1.56, 8.42), inadequate physical activity (AOR=12.04; 95% CI: 5.00, 19.19) and drinking alcohol (AOR = 8.69; 95% CI: 3.33, 12.67) were factors associated with overnutrition of adult epileptic patients.

**Conclusion**: The prevalence of both undernutrition and overnutrition was high. Iliterate educational status, singe marital status and less than or equal to 4850 ETB monthly income were factors associated with undernutrition whereas, frequency of meal greater than and equals to 3 timess/day, inadequate physical activity and drinking alcohol were factors associated with overnutrition among adult epileptic patients. Therefore, healthcare managers, supervisors, and policymakers identify those vulnerable groups early and thereby design effective nutritional strategies to intervene in malnutrition among adult epileptic patients.

**Keywords:** nutritional status, epileptic patients, public Hospital, Bahir Dar city, Ethiopia

# 1. INTRODUCTION

## 1.1 Background

Epilepsy is a chronic neurological disorder characterized by recurrent, unprovoked seizures affecting people of all ages and backgrounds (1). A seizure is a sudden, uncontrolled electrical disturbance in the brain that can cause changes in behavior, consciousness, movements, or sensations. There are different types of seizures, and they can be classified into two main categories: focal (partial) seizures and generalized seizures. Epilepsy is defined by: At least two unprovoked (or reflex) seizures occurring >24 h apart or One unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years. Epilepsy has a variety of causes, ranging from genetic, metabolic, infectious, structural, immune and unknown (2) .

The major modifiable risk factors for epilepsy are: perinatal insults, central nervous system infections, traumatic brain injury and stroke. This lead to effective interventions for prevention are available and delivered as part of broader public health responses in maternal and new-born health care, communicable disease control, injury prevention, cardiovascular health and nutritional care services and rehabilitation (3).

Epilepsy can have a significant impact on an individual's daily life, affecting aspects such as employment, education, and social interactions. However, with proper management and treatment, many people with epilepsy lead fulfilling and productive lives (4). Patients with impaired mental health are strongly vulnerable to the risks of having involuntary weight gain, weight loss, or deficiency of essential nutrients (5).

In people with epilepsy achieving optimal nutritional status may be hampered by psychological and physical comorbidities associated with socioeconomic disadvantage, medication use, nutritional counselling and social support (6,7). The nutritional status of individuals is an essential factor affecting mental health and the development of neurology diseases (1,8)

Nutritional status, a multifaceted concept encompassing dietary habits, body composition, and overall health, is crucial for the holistic management of chronic diseases. However, the specific factors influencing the nutritional status of epileptic patients remain insufficiently investigated. Limited research has been dedicated to unravelling the complexities of dietary intake, nutritional deficiencies, and the broader health implications in the context of epilepsy (9).

Maintaining optimal neurological health and preventing neurological diseases are contingent upon proper nutrition .The brain, as a primary organ with high energy demands, necessitates a balanced and nutrient-rich diet. Essential nutrients, including omega-3 fatty acids, vitamins, minerals, and antioxidants, play a crucial role in the development and maintenance of neural structures, neurotransmitter synthesis, and overall cognitive function. Nutrient deficiencies can result in impaired cognitive function, mood disorders, and an elevated risk of neurodegenerative diseases (10). Adopting a healthy diet is imperative for supporting brain health throughout the lifespan. The nutritional status in individuals with epilepsy reveals a complex landscape influenced by diverse factors. Within this context, the nutritional status of individuals with epilepsy varies across regions and is influenced by socio-economic factors (11).

Antiepileptic medications, crucial for seizure control, may impact nutrient absorption and metabolism, potentially contributing to nutritional deficiencies (12) and dietary interventions, such as the ketogenic diet, underscores the growing recognition of nutrition's impact on epilepsy management (13).

## 1.2 statement of the problem

Epilepsy accounts for a significant proportion of the world’s disease burden most common neurological diseases globally, affecting around 50 million people worldwide. In low- and middle-income countries (30, this figure can be as high as 139 per 100 000. This is likely due to the increased risk of endemic conditions such as malaria or neurocysticercosis; the higher incidence of road traffic injuries;poor nutritional status (14). The prevalence of estimated active epilepsy was 9 per 1000 peoples in sub-Saharan countries (15) and 5 per 1000 in Ethiopia (16). In addition, burden of Epilepsy accounts for over 13 million disability-adjusted life years (DALYs) and is responsible for more than 0.5% of the global burden of disease (17,18).

Malnutrition among epileptic patients continues to be a public health problem. There are double burden of over nutrition and undernutrition encountered among epileptic patients. Among studies reported a high magnitude of malnutrition among adult epileptic patients, with estimates are inconsistent findings ranging from 22% to 80 % ( 13, 16). In middle countries, there were high prevalence of over nutrition (over weight and obese) among epileptic patients(19),(20)(21).

In low-income countries, where access to a balanced diet may be limited, and malnutrition poses a significant concern on adult epileptic patients. An individuals with epilepsy up to 60% experienced malnutrition due to economic challenges and inadequate access to nutrient-rich foods (22). There was high magnitude of under nutrition among epileptic patients. For example, in Ethiopia, one in six (59%) epileptic patients were under nutrition at the University of Gondar Comprehensive Specialized Hospital's (23). In addition, related research reported that the proportion of under nutrition is high (24). Epilepsy itself can affect dietary habits, leading to altered eating patterns due to factors such as fear of triggering seizures, social stigma, or psychosocial stressors (25).

Furthermore, the use of anti-epileptic drugs (AEDs), a cornerstone in epilepsy management, is associated with various adverse effects, including alterations in appetite, weight gain, and metabolic disturbances (26,27). Moreover, socio demographic factors: sex (males are more prone), residences, occupational status (26), Lifestyle factors are among the contributing factors of malnutrition for epileptic patients. Such as, consuming alcohol, chewing chat, physical activity and co-morbidity factors: type II diabetes mellitus, arterial hypertension and stroke (24,26,28).

Despite the Sustainable Development Goals (SDGs) team in 2015 meeting calls for accelerated actions to highlight epilepsy as a public health priority, nutritional status among epileptic patients is not given attention(29) and health sector transformation plan. Furthermore, Prevention, as well as early detection and treatment of under and over nutrition among epileptic patients, is not well addressed. Such as, different micronutrient related researches in several countries (30–35) were conducted. The researcher's work experience in clinical services for epileptic patients was perceived as inadequate. Furthermore, the researcher has expressed a keen interest in pursuing additional studies. However, there is limited evidence regarding the prevalence of nutritional status and associated factors among epileptic patients, particularly in Ethiopia.

Furthermore, showing the magnitude of nutritional status among adult epileptic patients and identifying the responsible factors for malnutrition were vital for contribution to source of

evidence on a comprehensive understanding, nutrition-related health indicators, dietary intake, and food security and is making a holistic approach intervention with the responsible bodies.

Therefore, this study aims to assess the magnitude of nutritional status and associated factors among adult epileptic patients attending outpatient clinic at public hospitals of Bahir Dar City 2024.

## 1.3 significance of the study

The result of this study is an important inpute for national, regional and zonal health policy-makers by providing them information for further evidence based nutritional policy on adult epileptic patients.

This study findings is also helping to hospitals ,Bahir Dar Health Office and the Amhara Regional Health Bureau develops strategies to optimize nutrition intervention activities among adult epileptic patients.

Moreover, this research finding is used for researchers as a baseline data to further investigate in similar setting and it will also use for them to conduct further research on the same topics. In addition, the findings will give insight to the health professionals to use efficient and effective nutritional service strategies to protect their clients from malnutrition.

In short, the findings will be expected to contribute valuable insights that can inform clinical practices, enhance patient care, and pave the way for targeted interventions to improve nutritional status of individuals living with epilepsy.

# 2. LITERATUR RIVIEW

## 2.1 Magnitude of nutritional status of Epileptic patients

The magnitude of over and under nutrition type of malnutrition was presented in different countries conducted research. Among studies reported a high prevalence of malnutrition among adult epileptic patients, with estimates ranging from 22% to 80 % (13, 16).

A systematic review on nutritional status and dietary intake showed that people with epilepsy had poorer nutritional status and dietary intake when compared with control groups or reference standards (33).

A cross sectional study design was conducted at Cairo university hospital on epileptic patients enrolled to assess nutritional status were assessed and the findings were presented based on the BMI status: epileptic patients(3.1%), epileptic patients (36.7%), epileptic patients (24.2%) and epileptic patients (35.9%) were under nutrition, normal weigh tand over nutrition, respectively (34).

A Study report a higher prevalence of under nutrition, over nutrition, and specific nutrient deficiencies among adult epileptic patients compared to the general population (35). Similarly, several research studies have investigated the nutritional status of adult epileptic patients, exploring various aspects including prevalence, associated factors. In addition, individuals with epilepsy, who have higher body mass index (BMI) values and over nutritoin rates than the general population (34.1% and 23.7%, respectively) (36). Furthermore, a cross sectional study conducted at Alergre Porto Hospital, Brazil showed that the prevalence of under nutrition and over nutrition was 66.7%. (37). Moreover, the study finding showed that 20.0, 23.4, and 56.4% of adult epileptic patients who attended the outpatient department of Dessie referral hospital were under nutrition, over nourished, and well nourished, respectively (26). Another study reported from Jimma town public facilities the prevalence of overall malnutrition among adult epileptic patients was 78.2 %. Of this, 45.5% under nutrition and 32.7% overweight or obese (24). According to a study conducted at Gondar University hospital Ethiopia showed that the prevalence of over nutrition was 87.5% with BMI ranged from 24.2 to 31.3. Of which, over nutrition was 50% (28).

## 2.2 Factors of contributing for nutrition status of Epileptic patients

Nutritional status plays a crucial role in managing epilepsy and improving quality of life. However, various factors can influence the nutritional status of epileptic patients, leading to under nutrition, over nutrition, or deficiencies in specific nutrients (5).

Several factors contribute to under nutrition and over nutrition in epileptic patients. For this study we discussed the factors associated with nutritional status of epileptic patients including: socio demography and Socio-economic factors, health related factors, dietary related factors and life style related factors.

### 2.2.1 Socio-demographic and socio-economic related factors

There are a number of significantly associated Socio-demographic and socio-economic related factors with adult epileptic patients. Some of these were: age and gender were significantly associated with malnutrition and gender. Had no job was 7.1 times more likely malnourished than who had job (38). in addition, A study Jimma town, in Ethiopia reported from reported that age and gender(being male) were the significant factors of malnutrition of epileptic patients (24), similarly, A study conducted at Gondar hospital in Ethiopia, age, gender, income , occupational(being government employee and social protection were the contributing factors for malnutrition of epileptic patients (23,28). Social and psychological aspects of living with epilepsy may contribute to suboptimal nutritional status. Stigma associated with the disorder, social isolation, and mental health factors may further exacerbate challenges related to dietary choices and overall well-being (28).

### 2.2.2 Health related factors

The presence of other medical conditions (cardiovascular disease, diabetic mellitus Hypertension, cancer patients etc.) can further complicate nutritional status of epileptic patients (35,39).

Patients who are on the common treatment of AEDs have negative effect on the nutritional status of epileptic patients which can interfere with nutrient absorption and metabolism, leading to deficiencies in vitamins, minerals, and macro-nutrients. like, valproic acid can promote weight gain and obesity. These are AEDs (Type of, dosage, & Duration of treatments) with most common drugs. like; aprotic acid(40), lamotrigine and carbamazepine are most common Anti-epileptic drugs (27). In addition, Addressing depression, anxiety, and other mental health challenges can positively associated factors of nutritional status of epileptic patients (24). Moreover health related factors: such as, poor counselling significantly associated with nutritional status of epileptic patients (28).

### 2.2.3 Dietary related factors

The dietary diversity score was measured using the sum of ten food groups/items consumed by the participants. A study reported that participants low dietary diversity score more prone to food insecure and under nutrition for epileptic patients (24,26,28,34,35). Similarly studies

conducted at Gondar university hospital showed that dietary diversity associated with nutritional status with epileptic patients (35). Another study conducted at Dessie hospital showed that Knowledge of malnutrition (9,24) and dietary education and knowledge (35) were significantly associated with nutritional status with epileptic patients (24). Likewise, access to healthcare (nutritionist) and household food insecurity were significantly associated with nutritional status of epileptic patients (24).

In addition, Number of meals eaten, with whom you feed, Time to meal and Source of household food were significantly challenges the nutritional status of epileptic patients (26).

**2.2.4 Life style factors**

Epileptic patients have been doing their physical activity less likely to be malnutrition. This was reported from Gondar University, Epileptic patients (28). Similarly, regular physical activity helps maintain a healthy weight and can improve overall health and well-being in epileptic patients. The odds of over nutrition were found to be three times higher among patients who did not involve in physical activity than those who were involved in physical activity (24). Physical activity was associated with over nutrition among epileptic patients. Such as, Physical inactivity due to seizures, fear of falls, or social isolation increases the risk of over nutrition (28).

Furthermore, Behavioural life styles factors are determinant factors of nutrition status of epileptic patients; Such as, chew Khat and smoke Cigarettes (26,41).

.

## 2.3 CONCEPTUAL FRAME WORK

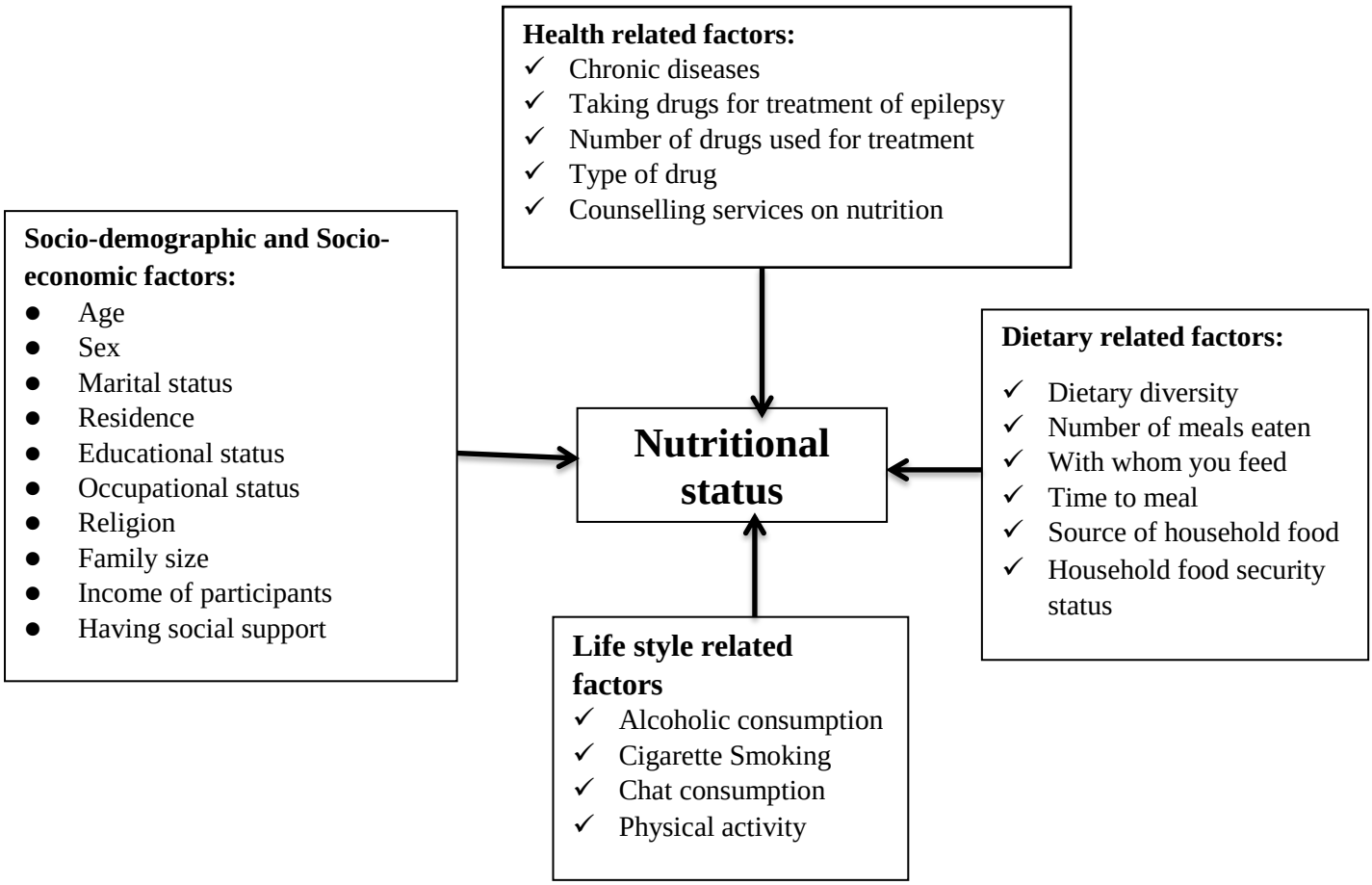


Figure 1: Conceptual framework for nutritional status among adult epileptic patients in Bahir dar city, Northwest, Ethiopia, 2024(9,24,26,28,33,34,35,36,37,38)

# 3. OBJECTIVES

## 3.1 General Objective

To assess the prevalance of nutritional status and its associated factors among adult epileptic patients of public hospitals in Bahir Dar city, Northwest Ethiopia 2024.

## 3.2 Specific objective

- To determine the prevalance of nutritional status among adult epileptic patients at public hospitals in Bahir Dar city, Northwest Ethiopia, 2024.
- To identify associated factors that affects nutritional status of adult epileptic patients at public hospitals in Bahir Dar city, Northwest Ethiopia, 2024.

# 4. METHODS AND MATERIALS

## 4.1 Study area and period

Bahir Dar city is far from capital city of Ethiopia (Addis Ababa) 565km in the Northwest direction. This study was studied at public hospitals of Bahir Dar city. Bahir Dar city has three public hospitals of which Feleghiwot and Tibebe Ghion are compressive specialized hospitals and Addis Alem is primary hospital. There are 4 Neurologist, 5psychiatrist, 20 psychiatry nurse, and 10 MSc Clinical psychiatry professionals at Bahir Dar city in the three public hospitals providing epilepsy medical the service. Outpatient, inpatient and emergency case management are service of psychiatry patients in the three hospitals. There are two OPDs for comprehensive specialized hospitals and one OPD for Addis Alem primary hospital. According to the hospitals, Health management Information System (HMIS) report of October 1/2023- November 30/2023 showed adult epileptic patients flow of the three hospitals: were on average per day 7 patient,6 patient and 1 patient were seen epileptic patient at follow up clinic in Tibebe gion, Felegehiwot and Addis alem hospitals respectively.

The study period was done from May 20/2024 to June 20/2024.

## 4.2 Study design

A cross sectional study was employed.

## 4.3 Population

### 4.3.1 Source population

All adult epileptic patients who had follow up in Bahir Dar city public hospitals.

### 4.3.2 Study population

All adult epileptic patients who had follow up in Bahir Dar city public hospitals during the data collection period.

## 4.4 Eligibility criteria

### Inclusion criteria

Adult epileptic patients who had follow up in the outpatients departments of public hospitals in Bahir Dar city, Ethiopia

### Exclusion criteria

Seriously ill patients, adult epileptic patients with physical deformity (kyphosis, sclerosis, unable to standing), edema and pregnant were excluded from the study.However; researchers did not obtain study participants who were fulfilled exclusion criteria.

## 4.5 Sample size determination

Sample size for the first objective is computed based on a single population proportion formula assuming the prevalence (p) of 59% was taken from Gondar study(23) conducted on the nutritional status and its associated factors among epilepsy patients , 95% confidence level (1.96), and 5% margin of error.

$$n = (\mathbf{Z}\alpha/2)^{\mathbf{2}}\,\frac{\mathbf{p(1-p)}}{\mathbf{d^2}}$$

Where; n = estimated sample size

Zα/2 = a standard normal value which corresponds 95% of confidence level = 1.96

p = estimated prportion of nutritional status is 0.59.

d = tolerable sampling error = 0.05

After substitution, the estimated sample size(n) is 372.

By adding 10% of the non-response rate, the total sample size of this study is 372+ 37=409.

For second objective sample size determined using factors associated with nutritional status of epileptic patients. Taking into consideration of the assumption: Power 80%, one to one ratio between exposed and unexposed groups, AOR (lower AOR to get larger sample size), % of outcome in exposed and unexposed group were taken. It is computed using EPI-info version 7.2.6 STATCALC dialogue box using cross sectional tool bar auto-calculate the sample size by entering in table 1 data elements and the final sample size included 10% non-response rate.

Table 1 Sample size determination using factors affecting nutritional status of epileptic patients in public hospitals of Bahir Dar city, 2024.

| Variables | Category | %outcome | Ratio | CI | Power % | AOR | Sample size | Reference |
|---|---|---|---|---|---|---|---|---|
| Age | < 20 years* | 86.2% | 1 | 95% | 80 | 0.25 | 121 | (38) |
| | ≥20 years** | 13.8% | | | | | | |
| Paternal education | No education* | 65.7% | 1:1 | 95% | 80 | 1.88 | 398 | (23) |
| | Primary and above** | 53.7% | | | | | | |
| Kat chewing | No** | 70.7% | 1 | 95% | 80 | 3.92 | 95 | (42) |
| | Yes* | 29.3% | | | | | | |
| Physical activity | Yes** | 13.5% | 1 | 95% | 80 | 2.99 | 293 | (38) |
| | No* | 28.3 | | | | | | |
| Meal frequency | < 3 per day* | 33.3% | 1 | 95% | 80 | 4.2 | 84 | (38) |
| | > =3 per day** | 66.7% | | | | | | |
| Comorbidity | No** | 53.8% | 1 | 95% | 80 | 2.79 | 154 | (23) |
| | Yes* | 8.2% | | | | | | |

* Proportion of malnutrition epileptic patients among exposed group
** Proportion of malnutrition epileptic patients among unexposed group

Therefore, the larger sample size of the first objective which is 409 epileptic patients was the final sample size for this study.

## 4.6 Sampling Techniques and procedures

Three public hospitals; Feleg Hiwot Comprehensive Specialized Hospital (FHCSH):, Tibebe Ghion Comprehensive Specialized Hospital (TGCSH) and Addis Alem Primary Hospital (APH) were used for this study. The total sample size was distributed in the three hospitals according to the adult epileptic patients daily flow in the follow up clinic. Accordingly, during the study period patients' flows were 210 in FHCSH, 180 in TGCSH, and 34 in APH. Proportional allocation by monthly patient fllow of the three hospitals was conducted. Finally, consecutive sampling technique was used for the approach of individual study participants until having the sample of 409 participants(figure 2).

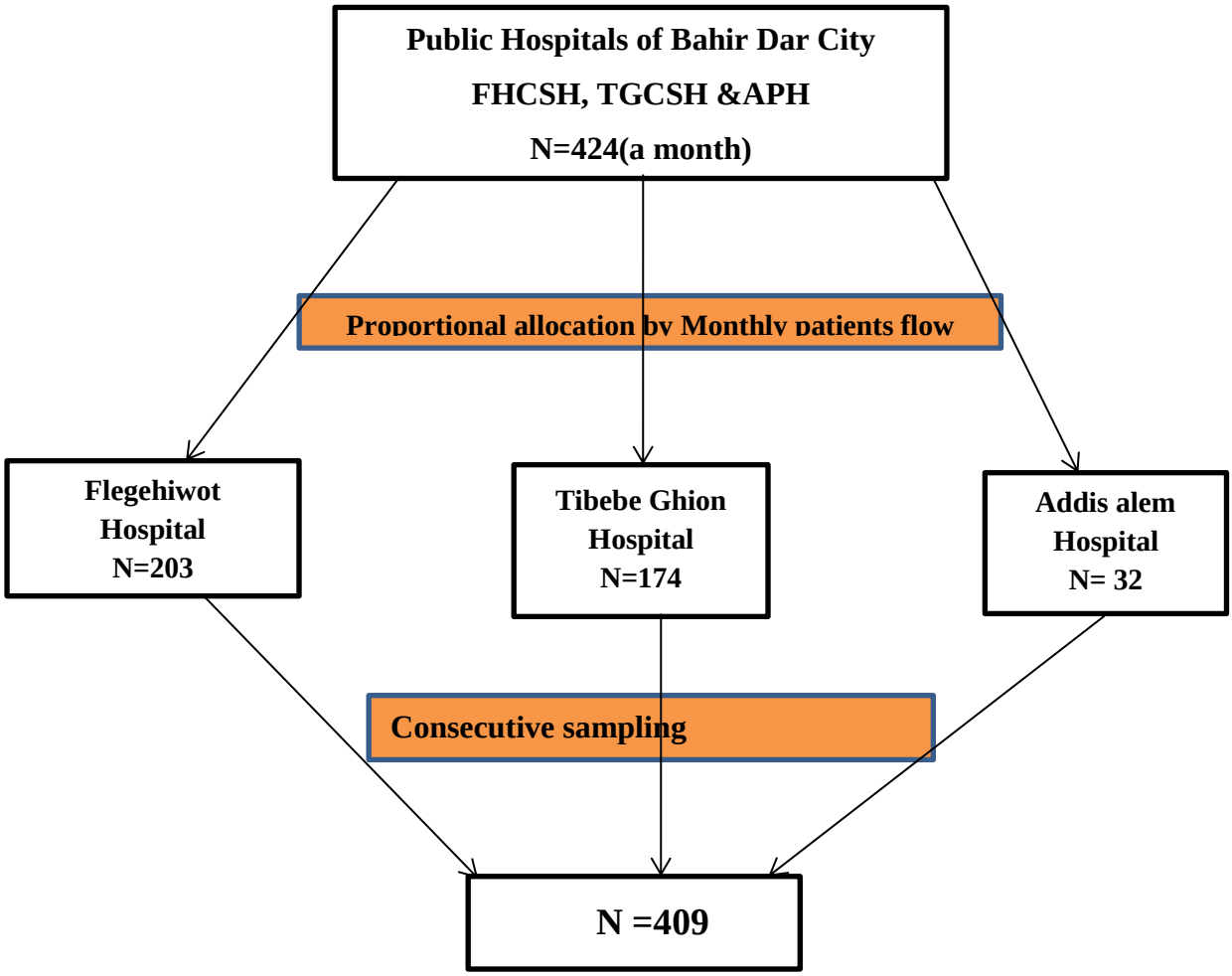


Figure 2: Schematic presentation showing sampling procedures in Bahir Dar, Northwest Ethiopia, 2024.

## 4.7 Study Variables

### 4.7.1 Dependent variable

Nutritional status(normal, under nutrition and over nutrition)

### 4.7.2 Independent variables

Socio-demographic and socio economic characteristics:

- ✓ Age
- ✓ Sex
- ✓ Marital status
- ✓ Residence
- ✓ Educational status
- ✓ Occupational status
- ✓ Religion
- ✓ Family size
- ✓ Income of participants
- ✓ Having social support

Dietary related factors

- ✓ Dietary diversity,
- ✓ Number of meals eaten
- ✓ With whom you feed
- ✓ Time to meal
- ✓ Source of household food
- ✓ Household food security status

Health related factors:

- ✓ Chronic diseases
- ✓ Taking drugs for treatment
- ✓ Number of drugs used for treatment
- ✓ Counselling services on nutrition

Life style factors:

- ✓ Alcohol drinking
- ✓ Khat consumption status
- ✓ Cigarette smoking
- ✓ Physical activity level

## 4.8 Operational definitions and term definition

**Body mass index (BMI):** weight of the individual in kilogram is divided by the square of the height in meter and used to determine the nutritional status of epileptic patients and classified as follows: BMI = undernutrition (< 18.5 kg/m2), normal (18.5 − 24.99 kg/m2), and Over nutrition (BMI ≥ 25.0 kg/m2) (43).

**Dietary diversity** is measured using the sum of food group/items consumed by the study participant and based on this, it is classified as follows: Accordingly: The food groups were categorized into two based on the computed mean value.

**Aduequat**: participants who ate equals and more than five food groups.

**Inaduequat**: participants who ate less than five food groups. (44)

**Khat chewing** is respondents can be responded yes for the question ‘’do you consume chat within a month? ’if yes coded as 1 otherwise 0 (45).

**Chronic disease**: the adult epileptic patients who have a condition that last 1 year or more and require ongoing medical attention or limit activities of daily living or both(46).

**Smoker**: the adult epileptic patients who have smoked at least 1 year(6).
**Non-smoker** : the adult epileptic patients who did not smoke in the year.
**Counselling services** on nutrition and can be measured in one yes or no question.
**Physical activity** of work-related and leisure/spare time was measured by global physical activity questionnaire (GPAQ). It also comprises routine daily tasks such as commuting, occupational tasks or household activities, as well as purposeful health-enhancing movements/activities. Then participants were classified into adequate physical activity and inadequate physical activity groups based on the overall cut-off point level of 600 metabolic equivalent tasks (MET)-min per week used. The total physical activity of ≥600 MET-min per week denotes adequate physical activity and an inadequate level of physical activity is represented by <600 MET-min per week according to the GPAQ-2 grading criteria (47,48).

**HFIAS**, Households were classifed based on responses to the nine severity items in the HFIAS and coded “0” for “No” and “1” for “Yes.” The procedure for scoring was used as follows: “0” was attributed if the event described by the question never occurred, “1” if it occurred during the previous 30 days. With regard to the occurrence, “1” was attributed if the events rarely occur, “2” sometimes and “3” often. Therefore, responses on the nine HFIAS questions were summed using the SPSS 26 version to create household food security score, with a minimum of “0” and a maximum score of “27.” According to the score, the higher the score, the more the household is vulnerable to food insecurity. The lower the score, the lesser the food insecurity a household experienced. Therefore, HFIAS score of 0–1 is categorized as food secure, 2 and above were considered as food insecure (49,50).

## 4.9 Data collection procedures and variables measurement

The questionnaire was initially developed in English and translated into the local language (Amharic). Foure trained BSc nurses for data collectors and a BSc in public health supervisor was recruited. The data collector team was selected based on familiarity with the study area, local language and interest to participate on the study.

The tool contains socio-demographic related factors, health related factors and dietary related factors, life style related factors and anthropometric body measurement.

A standard food and nutrition technical assistant (FANTA) tool was used for dietary diversity questionnaires based on 24-hour recall from subjects or caregivers. Subjects/caregivers was asked about ‘’yes or no’’ response about 10 food groups. The questionnaires have a score of participants who ate less than five food groups categorized as inaduquat and participants who ate participants who ate five and above food groups were adequate (33).

Food security was assessed using the household food insecurity access scale (HFIAS), a tool validated in other developing countries. The HFIAS has nine questions asking the household’s last month’s experience about three domains of food insecurity: feeling the uncertainty of food supply, insufficient quality of food, and insufficient food intake and its physical consequences. Responses was categorized into two levels of food-security status (food-secure and food-insecure)(50).

**Weight measurement**: Weight was measured by an electronic digital weight scale with minimum/lightly/clothing and no shoes. Calibration was done before weighing every adult epileptic patients by setting it to zero. Then reading the measurement to the nearest 0.1 k.g and also for every adult epileptic patients takes weight two times and takes average weight.

**Height measurement**: - Length/height measurement for adult epileptic patients is taken in standing position. The head of the study participant was put in the Frankfurt position (a position where the line passing from the external ear hole to the lower eyelid of a person is parallel to the board) and the measurement was taken to the nearest 0.1 cm. Study participants were on barefoot while measuring their height(35,51,52).

## 4.10 Data Quality Control mechanisms

Training was given to data collectors and supervisor by principal investigator for 2 day about the objectives of the study, data collection instruments, data collection procedures, physical measurement and the ethical consideration during data collection. Pre-test was performed in 5%(21) of the sample size in Adet primary hospital before data collection from April 6 -

9/2024 and necessary correction on the tool was performed based on the feedback. The pre-test data was used only for training of data collectors and to check validity and consistency of the tool. Bodyweight of the patient was measured using a SECA digital weight scale who wear only light clothes and being without shoes during the measurement of body weight with calibrated at the nearest 0.1 k.g using weight measuring scale and height was measured using a measuring board with calibrated at the nearest 0.1 cm. The head of the study participant is in the Frankfurt position (a position where the line passing from the external ear hole to the lower eyelid of a person is parallel to the board (42).Continuous check-up of measurement is performed for their reliability. Reliability was checked using Cronbach's' alpha > 0.7, which was computed values alpha value 0.87 for internal consistency constructs.

During data collection days the principal investigators and supervisors was checked data for completeness, consistency and clarity and correction was made at the data collection site. Data entry, coding and cleaning were performed by the principal investigator.

## 4.11 Data processing and analysis

Data were checked and entered into the Epi-Data version 4.6 statistical software and exported to Statistical Package for Social Science (SPSS) statistical software package, version 26 for analysis. Frequencies and proportions was used to summarize variables. Besides frequencies and proportions, each variable was presented using tables and figures. Association between nutritional status and each categorical variable was assessed using the multinomial logistic regression model. The outcome variable categorizes three forms: under nutrition, normal nutrition, and over nutrition. These categories were coded as follows: 1 for under nutrition, 2 for over nutrition, and 0 for normal nutrition. All independent variables with P-value < 0.25 in the bi-variable analysis was the candidate adjusting confounding variables for multivariable analysis. The model assumptions were checked. Among the assumptions multicollinearity was checked by VIF and Tolerance. Hence, the stastistics of collinearity showed that VIF ranged from 1.015 to 1.306 and Tolerance 0.777 to 0.985. Model fitness was also checked by likelihood ratio tests of chi-square and its significance level ($X^2$ =151.23, P=0.000).

The significance of association was determined at a P-value of < 0.05 in the multinomial multivariable analysis, while the strength of association is indicated by adjusted odds ratio (AOR) with 95% confidence interval.

## 4.12 Ethical Considerations

Ethical clearance was obtained from the Institutional Review Board of College of Medicine and Health Science Bahir Dar University. Supporting letter was obtained from Amhara Public Health Institute (APHI). In addition, written permission was obtained from three public hospitals administrators. Written informed consent was obtained from the patients as well as care takers after informing all the purpose, benefits, and risks of the study. Data collectors were informed patients at any time they can withdraw from responding the question because fully voluntary participation. Confidentiality was maintained by excluding personal identifiers from the data collection form(appendix 1). This research had not posed any harm.

## 4.13 Dissemination of Results

The results of the study was shared to the study communities, Bahir Dar city health office, health Bureau , APHI and respective administrative offices for appropriate intervention.

The finding was also presented to Bahir Dar University, College of Medicine and Health sciences, school of Public Health as part of master of public health in human nutrition post graduate thesis and it was also presented/shared to other organizations that are need this result. Finally publication will be considered through peer review journals and presentation in meeting/conferences.

# 5. RESULT

## 5.1 Sociodemographic and Economic Characteristics of Epileptic patients

A total of 409 epileptic patients have participated in the study, with a response rate of 100%. The median age of the participants was 23, IQR (20-30) years and majorities (64%) of ranged within 18-25 years old. Two hundred-six (50.4%) were female and 262 (66.4%) were single. Religiously, three in fourth, 75% (307) of patients were Orthodox followers. More than half, 53.1% (217) of participants were from rural residence. Regarding educational status, 139 (34%) of patients were no education, and 114 (27.9%) were secondary school. Among the study participants, 170 (41.6 %) were farmers in their occupation. Two-fifth, 65.5% (268) of the participants were from a family size of five and below. The averages monthly income of the household was 4850.37 Ethiopian Birr ($80.84 US) (**Table 2**).

Table 2 Sociodemographic and economic characteristics of epileptic patients in Public hospitals of Bahir Dar city, Northwest Ethiopia, July 2024 (n=409).

| **Variables** | **Frequency (n)** | **Percent (%)** |
|---|---|---|
| Age in years | | |
| 18-25 years | 262 | 64.0 |
| 26-35 years | 93 | 22.8 |
| >=36 years | 54 | 13.2 |
| Sex | | |
| Male | 203 | 49.6 |
| Female | 206 | 50.4 |
| Marital status | | |
| Single | 300 | 73.3 |
| Married | 109 | 26.7 |
| Religion | | |
| Orthodox | 307 | 75.0 |
| Muslim | 60 | 14.7 |
| Protestant | 42 | 10.3 |
| Residence | | |
| Rural | 217 | 53.1 |
| Urban | 192 | 46.9 |
| Educational status | | |
| No education | 139 | 34.0 |
| Primary school | 64 | 15.6 |
| Secondary school | 114 | 27.9 |
| College and above | 92 | 22.5 |
| Occupational status | | |
| Farmer | 170 | 41.6 |
| Merchant | 153 | 37.4 |
| Student | 42 | 10.2 |
| Employee | 44 | 10.8 |
| Family size | | |

| | | |
|---|---|---|
| Less than 5 | 268 | 65.5% |
| 5 and above | 141 | 34.5% |
| Monthly income in Ethiopian birr (ETB)* | | |
| <=4850.37 | 232 | 56.7% |
| >4850.37 | 177 | 43.3% |

*The minimum monthly income in Ethiopia (for civil servants) was 1000 ETB.

## 5.2 Feeding habits among epileptic patients

More than three-fifth (63.8%) of the respondents had eaten their meal less than and equals to two times per day and 266 (65.0%) participants had eaten their meal with irregularly periods. Almost nearly half 46% (188) of the study respondents' source of their household food was combination of own production and purchase and 214 (52.3%) of re respondents and 214 (52.3%) of respondents, had habit of taking their meal with family (Table 3).

Table 3: Dietary diversity and feeding habits of epileptic patients in Public hospitals of Bahir Dar city, Northwest Ethiopia, July 2024 (*n* = 409)

| Variables | Categories | Frequency (n) | Percent (%) |
|---|---|---|---|
| Frequency of meal per day | Twice and below | 261 | 63.8 |
| | Three times | 115 | 28.1 |
| | Four times and above | 33 | 8.1 |
| Time to have eaten | Regular* | 143 | 35.0 |
| | Irregular | 266 | 65.0 |
| With whom you ate | Family | 214 | 52.3 |
| | Alone | 195 | 47.7 |
| Source of household food | Own production | 118 | 28.9 |
| | Purchase | 103 | 25.2 |
| | Own and purchase | 188 | 46.0 |

*breakfast, lunch and dinner,

### 5.3 Diteary diversity score

The mean food group consumption among epileptic patients was 4.2(±1.5) with a range of 0 to 8. Epileptic patients ate monotonous food groups, almost all participants consumed cereals, 97.8% (400), followed by legumes, 96.1% (393), and oils, 87.3% (357) whereas meat, 18.7% (76) and Eggs, 23.8% (97) were the least consumed. The dietary diversity was measured using the sum of ten food groups/items consumed by the participants. Accordingly, The food

groups were categorized intow tow based on the computed mean value. Hence, participants who ate equals and more than five food groups were 26.7 %( 101) and less than five food groups 75.3 %( 308) (**Figure 3 food groups consumption pattern among epileptic patients in Bahir dar public hospitals, Northwest Ethiopia,July, 2024**).

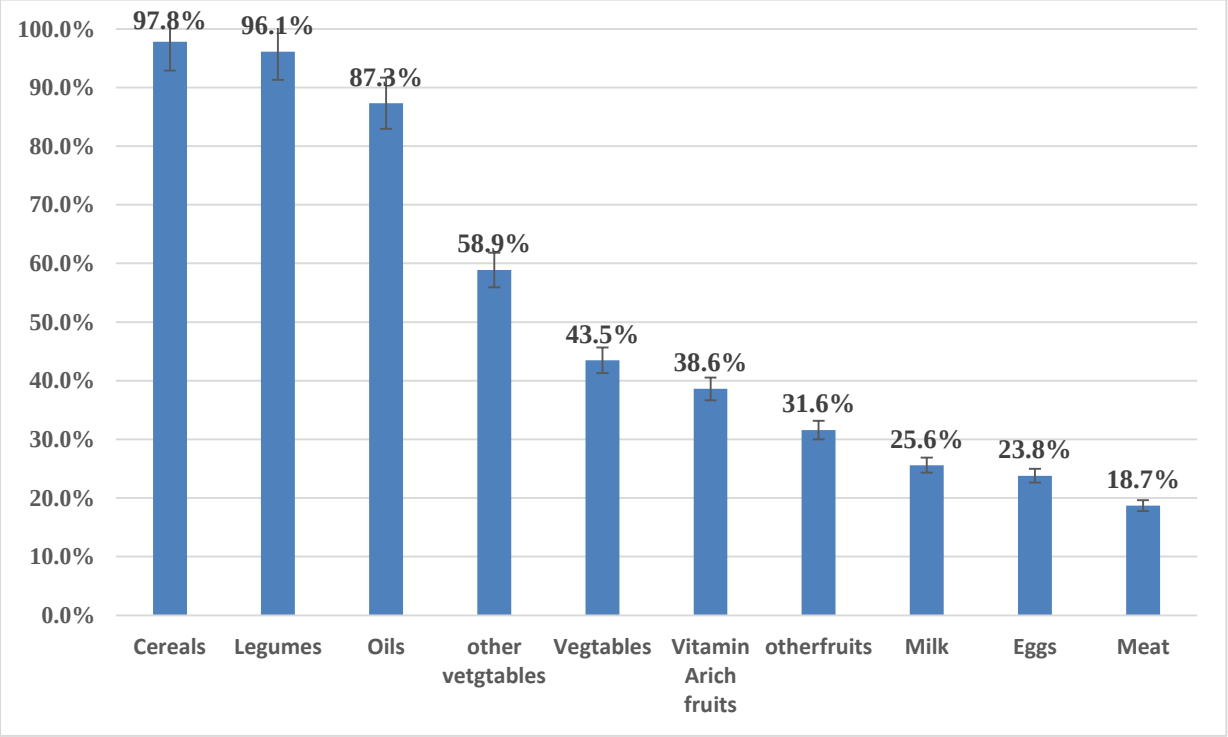


Figure 3 food groups consumption pattern among epileptic patients in Bahir dar public hospitals, Northwest Ethiopia,July, 2024

### 5.4 Household food insecurity scale (HFIAS) among epileptic patients

In this study, the finding showed that 52.1% (n=213) who had never worried having not enough food, whereas the remaining 47.9 (196) of surveyed epileptic patients households have experienced problems of both economic and physical access to food at varying levels of food insecurity. Accordingly, food security status was 52.1% whereas 47.9% were food insecure.

Table 4: household food insecurity scale (HFAIS) distributions among epileptic patients attending at public hospitals in Bahir Dar City, Northwest Ethiopia.

| No | HFAIS questionnaires | No | | Rarely | | Sometimes | | always | |
|---|---|---|---|---|---|---|---|---|---|
| | | n | % | N | % | N | % | N | % |
| 1 | Worry about food | 213 | 52.1% | 132 | 32.3% | 30 | 7.3% | 34 | 8.3% |
| 2 | Unable to eat preferred foods | 189 | 55.0% | 112 | 27.4% | 75 | 18.3% | 33 | 8.1% |
| 3 | Eat just a few kinds of foods | 225 | 70.2% | 96 | 23.5% | 68 | 16.6% | 20 | 4.9% |
| 4 | Eat foods they really do not want eat | 287 | 73.6% | 69 | 16.9% | 38 | 9.3% | 15 | 3.7% |
| 5 | Eat a smaller meal | 301 | 73.6% | 68 | 16.6% | 32 | 7.8% | 8 | 2.0% |
| 6 | Eat fewer meals in a day | 330 | 80.7% | 53 | 13.0% | 21 | 5.1% | 5 | 1.2% |
| 7 | No food of any kind in the household | 339 | 82.9% | 52 | 12.7% | 18 | 4.4% | 0 | 0.0% |
| 8 | Go to sleep hungry | 366 | 89.5% | 43 | 10.5% | 0 | 0.0% | 0 | 0.0% |
| 9 | Go a whole day and night without eating | 388 | 94.9% | 21 | 5.1% | 0 | 0.0% | 0 | 0.0% |

## 5.5 Clinical characteristics of epileptic patients

In Table 5 illustrated that the most majority of respondents 94.6% (387) had not comorbidity disease. One –third of epileptic patients were taking phenytoin drug for the management of epilepsy and three –fourth of the epileptic patients taking single drug. Two hundred fifty (61.18%) of the study participant had not gotten nutrition-related counselling or intervention along with epileptic patients treatment (Table 5).

**Table 5: clinical characteristics of epileptic patients attending at public hospitals of in Bahir Dar city, northwest Ethiopia, July,2024**

| Variables | Descriptions | Frequency (n) | Percent (%) |
|---|---|---|---|
| Comorbidity diseases | Yes | 22 | 5.4 |
| | No | 387 | 94.6 |
| Common Antiepileptic drugs (AEDs) | Phenytoin | 135 | 33.0 |
| | Phenobarbital | 113 | 27.6 |
| | carbamazepine | 48 | 11.7 |
| | Sodium valproate | 43 | 10.5 |
| | combine drugs | 70 | 17.1 |
| Number of drugs received | Single drug | 309 | 75.6 |
| | Two and above | 100 | 24.4 |
| Nutrition counselling | Yes | 159 | 38.9 |
| | No | 250 | 61.1 |

## 5.6 Social support and Behavior characteristics of epileptic patients

In table 5 showed that, the majority, 336 (82.2%), of the study participants had social support. The majority of participants 340 (83.1%) were not drinking alcohol. Epileptic patients were not experienced on the chet consumption and cigarette smoking.

Sixty-nine (16.9%) of participants performed vigorously (running, football, digging, carrying, and lifting) physical activity with an average of 2 days per week, and the mean time spent were 59.4 minutes. Moreover, 195 (47.7%) of participants perform moderate (brisk walking, cycling, swimming, volleyball) physical activity averagely 2.4 days per week with a mean time of 101.6 minutes spend per each session. Furthermore, 98(24%) of participants perform low (sitting, sedentary and sleeping) physical activity averagely 3.6 days per week with a mean time of 135.22 minutes spend per each session (**Table 6**).

Table 6 Distribution of ssocial support and Behavior among epileptic patients attending in public hospitals of Bahir Dar city, Northwest Ethiopia, July 2024 (n=409)

| Variable | Category | Frequency (n) | Percent (%) |
|---|---|---|---|
| Social support | Yes | 336 | 82.2 |
| | No | 73 | 17.8 |
| Alcoholic drinking | Yes | 69 | 16.9 |
| | No | 340 | 83.1 |
| Cigarette Smoking | No | 409 | 100.0 |
| Chat chewing | No | 409 | 100.0 |
| Physical activity levels | | | |
| Strong physical activity | Yes | 69 | 16.9 |
| | No | 340 | 83.1 |
| | Average days per week | 2 days | |
| | Average minutes per session | 59.4 minutes | |
| Moderate physical activity | Yes | 195 | 47.7 |
| | No | 214 | 52.3 |
| | Average days per week | 2.4 days | |
| | Average minutes per session | 101.6 minutes | |
| Low physical activity | Yes | 98 | 24.0 |
| | No | 311 | 76.0 |
| | Average days per week | 3.6 days | |
| | Average minutes per session | 135.22 minutes | |

*grandmother/father, auncle, aunt,

## 5.7 Prevalence of nutritional status of epileptic patients

The prevalence of overall malnutrition (udernutrition and overnutrition) among epileptic patients was 49.6%. Regarding their body mass index, half of the participants 50.4% (95% CI: 45.5%, 55.2%) were in the normal range, 34.5% (95% CI: 30.0%, 39.2%) were having undernutrition, and 15.1 %( 95% CI: 11.9%, 19.01%) were having over nutrition (**Error! Reference source not found.**).

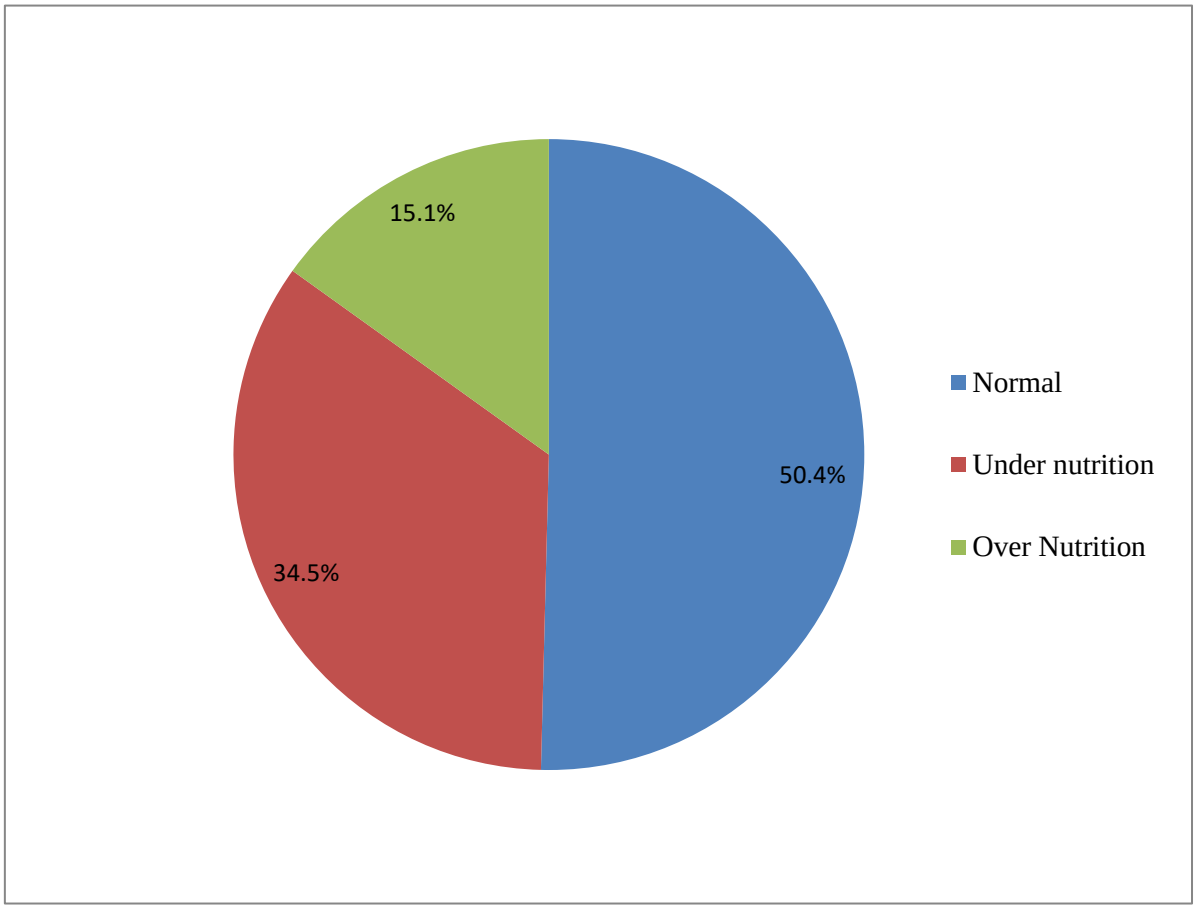


Figure 4 : prevalence of nutritional status of epileptic adult patients who were attending public hospitals in Bahir dar city, northwest Ethiopia, July 2024.

## 5.8 Factors Associated with Nutritional Status of Epileptic Patients.

In bivariable logistic regression analysis: educational status, marital status, and monthly income were significant variable with under nutrition whereas frequency of meal, physical activity and alcohol drinking were significantly associated with overnutrition when compared with reference dependent varaiable category of normal nutrition and these were found to be a candidate for multivariable logistics regression.

In the final model, factors significantly associated with under nutrition were educational status, marital status and monthly income. Accordingly, the odds of having undernutrition were 2.2 times more in illiterate than literate (AOR: 2.15; 95% CI: 1.25, 3.69). The odds of being undernourished were 2.2 times more likely in single marital status than married (AOR= 2.29; 95% CI: 1.22, 4.32, p=0.001) when compared to normal nutrition. Patients who had monthly income in Ethiopian birr less than or equal to 4850 were 2 times more likely to be undernourished (AOR=2.02, 95% CI: 1.26, 3.24, p=0.001) as compared to those who were greater than 4850 Ethiopian birr monthly income.

However, factors significantly associated with over nutrition in the final model were frequency of meal, drugs of epilepsy treatment, physical activity and alcohol consumption. Accordingly, the odds of having over nutrition were 4.8 times more in patients who ate more than three times frequency of meal than patients who ate less than three meals per day (AOR=4.75; 95% CI: 1.56, 8.42, P<0.06). The probability of being over nourished was 12 times more among patients who were not involved in physical activity than those who were doing physical activity (AOR=12.04; 95% CI: 5.00, 19.19, p=0001). Patients who experienced drinking alcohol were 8.69 times more over nourished compared to those who did not drink alcohol (AOR = 8.69; 95% CI: 3.33, 12.67, p=)(Table 7).

**Table 7:** Table: Factors associated with nutritional status of adult epileptic patients attending OPD of Bahir Dar public hospitals, Northwest Ethiopia, July, 2024.

| Variable | Nutritional status | | | Under nutrition | | Over nutrition | |
|---|---|---|---|---|---|---|---|
| | Normal | Under | Over | COR (95% CI) | AOR( 95% CI) | COR (95% CI) | AOR (95% CI) |
| **Educational status** | | | | | | | |
| Illiterate | 66(32%) | 67(47.9 %) | 5(8.1%) | 1.98(1.27,3.07)** | 2.15(1.25, 3.69)** | - | - |
| Literate | 140(68%) | 73(52.1 %) | 57(91.9%) | 1 | 1 | - | - |
| **Marital status** | | | | | | | |
| Single | 141(68.4) | 110(78.6 %) | 49(77.4 %) | 1.706(1.04, 2.81)* | 2.29(1.22, 4.32)* | - | - |
| Married | 65(31.6%) | 30(21.4 %) | 14(22.6 %) | 1 | 1 | - | - |
| **Monthly income in Ethiopian Birr** | | | | | | | |
| <=4850 | 102(49.5%) | 92(65. 7%) | 37(59.7 %) | 1.95(1.26, 3.04)* | 2.02(1.26, 3.24)** | - | - |
| >4850 | 104(50.5%) | 48(34. 3%) | 25(40.3 %) | 1 | 1 | - | - |
| **Frequency of meal/day** | | | | | | | |
| Greater than 3 | 69(33.5 %) | 70(59. 6%) | 9(14.5% ) | - | - | 2.97(1.38, 6.36)* | 4.75(1.56, 8.42)** |
| Less than 3 | 137(66.5 %) | 71(50. 4%) | 53(85.5 %) | - | - | 1 | 1 |
| **Physical activity** | | | | | | | |
| Inadequate | 18(8.7 %) | 13(9.3) | 38(61.3%) | - | - | 16.54(8.18, 33. 42)** | 12.04(5.00, 19.19)** |
| Adequate | 188(9 1.3%) | 127(90.7 %) | 24(38.7%) | - | - | 1 | |
| **Alcohol drinking** | | | | | | | |
| Yes | 21(10. 2%) | 17(12. 1%) | 31(50%) | - | - | 16.65(5.07, 24.65)** | 8.69(3.33, 12.67)** |
| No | 185(89 .8%) | 123(87 .9%) | 31(50%) | - | - | 1 | |

1= reference group; ∗Significant at *P* value <0.05; ∗∗Significant at *P* value ≤0.001

# 6. DISCUSSION

The main purpose of this study was to determine the prevalence of nutritional status among epileptic patients in public hospitals at Bahir dar city Northwest Ethiopia as well as its associated factors. It was observed that 34.5% (95% CI: 30.0%, 39.2%), 15.1 % (95% CI: 11.9%, 19.01%) and 50.4% (95% CI: 45.5%, 55.2%) of adult epileptic patients who attended at public hospitals of Bahir Dar city were undernutrition, over nourished, and well-nourished, respectively. educational status, marital status, and monthly income were associated factors of under nutrition among epileptic patients whereas, frequency of meal, physical activity and alcohol drinking were found to be a significantly associated with over nutrition among epileptic patients.

This study under nutrition proportion was consistent finding with Jimma, Ethiopia (32%), and Dessie, Ethiopia (24,26). The proportion of undernutrition is lower than a study conducted in Gondar Ethiopia 59% (23). This lower result might be due to the difference in study participants and methodological: data analysis. However, the proportion of undernutrition in the study area is much higher than studies done in Cairo, Egypt, 3% (20), 13.8% in Turkey ((53), 10.1% in Norway (57). This discrepancy might be due to variations in methodological approach, advancement of knowledge on the care of nutrition related activities and health care access. Patients with epilepsy in developing countries are usually outcast from their society. Moreover, prevention, screening and treatment of nutritional disorder in epileptic patients care in affluent nations settings are much better than the care in Ethiopia (54).

In this study, the over nutrition among epileptic patients was much lower than a study conducted in Cairo, Egypt, 60.1% (20). Another study conducted on epileptic patients in Brazil showed that the prevalence of over nutrition was 66.7% (21). Furthermore, a Chinese study reported that 55. 2% of epileptic patients were over nutrition (55). This discrepancy might be socio economic, cultural and feeding habits were better in developed countries compared with low income countries, including Ethiopia. However, Norwigian(56) research on youth epileptic patients showed tha 15.0% were over nutrition which is comparable to this study.

Education level of the household head is an important variable mostly assumed to have an impact on nutritional status of the epileptic patients. According to this study, epileptic patients whose were illiterate more likely to be under nutrition compared with those who were literate epileptic patients. It also agrees with the fndings of study conducted in Jimma

Ethiopia which showed that informal education was 11.5 times malnutrition (57). The result also coincides with the theoretical evidences that education equips individuals with the necessary knowledge of how to make a living for accessing information on best nutrition, and health of epileptic patients and better decision-making. Then education played an active part in improving the capacities of people that can generate a beneficial element in the fight against nutrition and their health.

In this study, the marital status of single epileptic patients were 2.29 times more likely undernutrition than married marital status when compared to normal nutrition. This finding was consistent with other studies conducted elsewhere (24,35). The possible justifications are the likelihood of nutritional challenges among single might be related to feelings of isolation, lack of family support and encouragement, all of which can impact on the better contribution of health.

Furthermore, study participants in the households with low monthly income were found to have a likelihood of malnutrition. Less than 4850 monthly income was 2 times more likely under nutrition than who had got monthly income of greater or equal to 4850 ETB. Our findings are consistent with those research conducted in Ethiopia, which showed an association between lower economic status with patients(58). The explanations might be lower standards of living have less access to food, which strains their food security and causes them to consume less food on a daily basis both in terms of quantity and quality, and receive poorer health care because finance is a limiting issue regarding availability of foods in the home. Financial reliance and nutritional status were found to have a substantial relation in another investigation.

The number of meal frequency greater than 3 meals per day was the potential predictors for over nutrition. In this study, epileptic patient's meal frequency of greater or equal to three per day was 4.8 times more likely over nutrition compared less than 3 meals per day under the consideration of normal nutrition. This finding consistent with studies conducted in Ethiopia(26) and in Egypt (20). However, A cross-sectional study from rural area of Benin showed that epileptic patients who were eaten less than three meals/day 4.2 times (AOR=4.2: 95%CI: 1.6, 10.9) more likely to malnutrition (38).

The odds of over nutrition were found to be twelve times higher among patients who did not involve in physical activity than those who were involved in physical activity. This might result from the inability to lose excess energy and excess body weight. The finding is in line with a study conducted in the US among adult population, which showed that obesity was associated significant with neurologic disorders(59). Epilepsy is the comments neurologic

disease and has associated with stigma. In the interest of safety, the activities of persons with epilepsy are restricted. In keeping with this physical exercise has often been discouraged and the precise nature of a person's seizures (whether seizures were provoked or unprovoked) may not have been considered(60). This finding was also supported by the Poland study (61).

In this study, alcohol drinking was the important factors associated with over nutrition among epileptic patients in Bahir dar city, northwest Ethiopia. Epileptic patients who were consumed alcohol were 8.7 times more likely to be over nutrition than who were not consumed alcohols compared to normal nutrition. Alcohol consumption leads to over nutrition among epileptic patients. This study in line with a study conducted at (62). However, there are indirect relationships and considerations that could influence nutritional status in epileptic patients, including potential effects of alcohol on dietary habits, nutrient absorption and overall health. In addition to this, a study conducted in Malawi on anthropometric characteristics, and the burden of altered nutritional status among neuropsychiatric patients at Zomba mental Hospital had shown that alcohol use are known risk factors for undernutrition (63). Similary, a study in Ethiopia showed patients with under nutrition were 0.2 times (AOR= 0.20, 95%CI: 0.56, 0.74) less likelt to be exposed to not consuming alcohol than with consumed alcohol (42). These controversis might be difference of methodological approaches, socio-cultural contexts and economic status.

# 7. STRENGTH AND LIMITATION OF THE STUDY

## 7.1 Strength of the study

Using adequate sample size and including all adult epileptic patients with all types of measurements of height and weight in the study to see the nutritional status distribution among adult epileptic patients were the strength of the study.

## 7.2 Limitation of the study

Despite its strength, this study might be prone to some limitations: such as, social desirability bias and recall bias as a result of using an interviewer-administered questionnaire and remembering the events like, household food insecurity and dietary diversity questions. Furthermore, It did not also show the cause-effect relationship of nutritional status and adult epileptic patients because of its cross-sectional nature.

# 8. CONCLUSION

The prevalence of under and over nutrition was found to be high in the study area, which was above the national average. Educational status, marital status and monthly income were factors associated with undernutrition whereas Frequency of meal, inadequate physical activity and alcohol drinking were factors associated with over nutrition among epileptic patients.

# 9. RECOMMENDATION

**For health care providers**

- Screening the nutritional status of epileptic patients can alleviate burdens and prevent further complications.
- Healthcare providers should consistently provide nutritional counseling and weight management as integral components of their treatment plans.
- It's crucial to recognize that nutrition plays a profound role in neurotransmitter production and utilization, potentially exerting significant effects on physical, mental, and emotional functions.

**Regional health bureau and zonal health department**

- Developed training programs for healthcare providers to initiate nutrition screening and provide tailored nutritional counseling.
- Designed effective nutritional strategies to address malnutrition in adult patients with epilepsy.

**For researchers**

This study employed a cross-sectional design, focusing primarily on nutritional status assessment which was not showed direct cuase and effect association. Therefore, future research should consider retrospective or prospective study designs to explore this effect. These designs should incorporate additional variables such as the specific types of drugs used, their duration of use, frequency of seizures, and adherence to recommended dietary practices for managing epilepsy and health system related varaibles.

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# 11.APPENDI X

## 11.1 Appendix1

### 11.1.1 Participant information sheet (English Version)

Good morning? /Good afternoon? My name is …….. I am a data collector and I am here on behalf of Mastewal Tamiru student of Bahir Dar University College of Medicine and Health Science School of public health Department of Nutrition and Dietetics. She is conducting a research on 'Nutritional status and its associated factors among epileptic patient's public hospitals in Bahir Dar city for theartial fulfilment of master's in public health nutrition. She received permission from Bahir Dar University College of medicine and health science school of public health and Amhara public health institute to conduct this study.

**Purpose and benefit of the study**: this study determines the prevalence nutritional status among epileptic patients and identifies its associated factors. Accordingly, it was helped in providing an insight for policy makers, planners and baseline information for researchers on issues regarding on the nutritional status of epileptic patients. It can also have a role in follow up nutritional status for epileptic patients.

**Voluntary participation**

You are selected to participate in this study. Your participation is purely based on your willingness. You have full right either to participate or decline to be a participant in this study.

If you agree to participate in the study, you was asked to answer some questions about yourself. The interview lasts with you was take about 20-30 minutes. all the questions or you may not answer questions you don't want to, and have the right to stop the interview at any time. You also have the right to choose not to take part in this study. Participating in this study will not have any risk or harm. Whether you are willing to participate, refuse or decide to withdraw later, you will not be subjected to any ill treatment. Any information that you provide will be kept confidential, names will not be written or specified and all the questionnaires was coded for anonymity. No one will have access to the non-coded data except the principal investigator. Only the principal whom to contact at any time for further explanation.

Name of investigator will you know the details and she will discard it after completing analysis. The data will not be used for purposes other than the study. Your willingness and active participation is very important for the success of this study. Contact details of principal investigator.

**Risk of the study**: This study has no any risk for participants.

Participants' rights: your participation is voluntary, and you are not required to answer any questions you do not wish to answer. This interview will take about 20-30 minutes. If you feel discomfort with the interview, please feel free to withdraw from the interview at any time.

**Confidentiality:** Your name will not be written in this form and will never be used in connection with any information you tell us. All information given by you will be kept strictly confidential.

### 11.1.2 Informed consent (English Version)

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that I will still get the same medical care whether I decide to leave the study or not and my decision will not change the care what I will receive from medical centres.

Respondent agree to participate? YES NO

Informed consent Certified by

Respondent’s signature/thumb print_____

Date _____

Interviewer: Name _____ Signature_____

Questionnaire ID number _____

Date of interview _____ Time started _____ Time completed_____

Result of interview:

1. Completed
2. Refused
3. Partially completed

Checked by: Supervisor:

Name _____ Signature_____

Principal investigator Name: Mastewal Tamiru

Principal investigator Address:

Mobile number: +251 986373669

E-mail: mastewaltamiru2011@gmail.com

Thank you very much for your co-operation!

### 11.1.3 Questionnaire (English version)

| Description | Identification |
|---|---|
| Region | |
| Zone | |
| Woreda | |
| Supervisor name and signature | |
| Data collector name and signature | |
| I.D number/House number | _____/_____ |
| Date of the interview | _____/_____/2024 |

### 11.1 Socio-demographic and economic factors

| Code | Questions | Response | Skip |
|---|---|---|---|
| 101 | Sex | 1.male<br>2.female | |
| 101a | If your sex is female and had pregnancy | Stop the next question to ask the woman | |
| 102 | What is your age in years? | _____ | |
| 103 | What is your marital status? | 1. Married<br>2. Single<br>3. Divorced<br>4. Widowed<br>5. Others (specify) _____ | |
| 104 | What is your educational status? | 1. Unable read and write<br>2. Read and write<br>3. Primary school (1-8) | |

| | | | |
|---|---|---|---|
| | | 4. Secondary school (9-12)<br>5. Diploma and above<br>6. Others (specify) _____ | |
| 105 | What is your occupational status? | 1. Merchant<br>2. Governmental employee<br>3. Daily labourer<br>4. House wife<br>5. Others (specify) _____ | |
| 106 | What is your religion? | 1. Orthodox<br>2. Muslim<br>3. Protestant<br>4. Catholic<br>5. Others (specify) _____ | |
| 107 | Monthly income in birr | ---------- | |
| 108 | Residency | 1.Urban<br>2.Rular | |
| 109 | How many persons live in this household? | _____ (in number) | |
| 110 | Do you have a social support? | 1. Yes<br>2. No | |

### 1.2 food insecurity, dietary diversity and feeding practices related factors

#### 1.2.1 Food insecurity (HFIAS questions)

**N.B:- Rare:** once or twice in the past four weeks, **Sometimes:** three to ten times in the past four weeks and **Often:** more than ten times in the past four weeks

| ID | Questions | Response | Skip |
|---|---|---|---|
| 201 | In the past four weeks, did you worry that your household would not have enough food? | 0 = No<br>1 = Yes | If no, Q201a |
| 201 a | How often did this happen? | 1 = Rarely<br>2 = Sometimes<br>3 = Often | |
| 202 | In the past four weeks, was you or any household member not able to eat the kinds of foods you preferred because of a lack of resources? | 0 = No<br>1=Yes | If no, Q202a |
| 202 a | How often did this happen? | 1 = Rarely<br>2 = Sometimes<br>3 = Often | |
| 203 | In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources? | 0 = No<br>1 = Yes | If no, Q203a |
| 203 a | How often did this happen? | 1 = Rarely<br>2 = Sometimes<br>3 = Often | |
| 204 | In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food? | 0 = No<br>1 = Yes | If no, Q204a |
| 204 a | How often did this happen? | 1 = Rarely<br>2 = Sometimes<br>3 = Often | |

| | | | |
|---|---|---|---|
| 205 | In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food? | 0 = No<br>1 = Yes | If no, Q205a |
| 205 a | How often did this happen? | 1 = Rarely<br>2 = Sometimes<br>3 = Often | |
| 206 | In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food? | 0 = No<br>1 = Yes | If no, Q206a |
| 206 a | How often did this happen? | 1 = Rarely<br>2 = Sometimes<br>3 = Often | |
| 207 | In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food? | 0 = No<br>1 = Yes | If no, Q207a |
| 207 a | How often did this happen? | 1 = Rarely<br>2 = Sometimes<br>3 = Often | |
| 208 | In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food? | 0 = No<br>1 = Yes | If no, Q208a |
| 208 a | How often did this happen? | 1 = Rarely<br>2 = Sometimes<br>3 = Often | |
| 209 | In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food? | 0 = No<br>1 = Yes | If no, Q209a |
| 209 a | How often did this happen? | 1 = Rarely | |

| | | | |
|---|---|---|---|
| | | 2 = Sometimes<br>3 = Often | |

**1.2.2 Diversity score of food groups (9 food groups)**

| S.No | Food groups | Yes(1) | No(0) | Remark |
|---|---|---|---|---|
| 210 | Grains or other starchy roots and tubers | | | |
| 211 | Vitamin A rich fruits and vegetables | | | |
| 212 | Green Leafy Vegetables | | | |
| 213 | Other vegetables and fruits | | | |
| 214 | Meat, Fish and Seafood | | | |
| 215 | Organ meat | | | |
| 216 | Eggs | | | |
| 217 | Legumes, seeds and nuts | | | |
| 218 | Milk and Dairy products | | | |

**1.2.3 Feeding Practice Related Variables**

| Code | Questions | Response | Skip |
|---|---|---|---|
| 230 | Meal frequency practice in the previous 24 hours | _____ times | |
| 231 | Ability of the respondent to feed self? | 1. Yes<br>2. No | |
| 232 | With whom you are feeding? | 1. Always alone<br>2. Sometimes alone<br>3. Always with family Members<br>4. Sometimes with family members | |
| 233 | Time to have meal? | 1. Regular ( at the time of breakfast, lunch, snack and dinner)<br>2. Irregular (any time s/he eat when they | |

| | | | |
|---|---|---|---|
| | | get food) | |
| 234 | Where is your source of food | 1. Rent<br>2. Wage<br>3. Support<br>4. Others_____ | |
| 234 | In the last 24 hours, Do you eat different types of food? | 1. Yes<br>2. No | |
| 235 | If your answer is yes, tell us the foods eaten by yourself? Write the answers on the space | | |

**1.3 Life style related variables**

| ID | Questions | Response | Skip |
|---|---|---|---|
| 300 | Do you have been drinking any alcohol? | 1. Yes<br>2. No | |
| 301 | Do you consume chat within a month? | 1. Yes<br>2. No | |
| 302 | Do you smoke cigarette within a month? | 1.yes<br>2.no | |
| **Physical activity** | | | |
| 303 | Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like [carrying or lifting heavy loads, digging etc.] for at least 10 minutes Continuously? | 1. Yes<br>2. No<br>If No, go to 306 | |
| 304 | In a typical week, on how many days do you do vigorous intensity activities as part of your work? | _____Number of days | |
| 305 | How much time do you spend doing vigorous-intensity activities at work on a typical | _____Minutes | |

| | | | |
|---|---|---|---|
| | day? | | |
| 306 | Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for at least 10 minutes continuously? | 1. Yes<br>2. No<br>If No, go to 309 | |
| 307 | In a typical week, on how many days do you do moderate intensity activities as part of your work? | _____Number of days | |
| 308 | How much time do you spend doing moderate-intensity activities at work on a typical day? | _____Minutes | |
| 309 | Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places? | Yes 1<br>No 2 If No, go 312 | |
| 310 | 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? | Number of days<br>---------- | |
| 311 | How much time do you spend walking or bicycling for travel on a typical day? | Hours : minutes<br>hrs ------- mins---------- | |
| 312 | Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like [running or football,] for at least 10 minutes continuously | Yes 1<br>No 2 If No, go to315 | |

| | | | |
|---|---|---|---|
| 313 | In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities | Number of days | |
| 314 | How much time do you spend doing vigorous-intensity sports, fitness or recreational activities Hours : minutes | Hours minutes<br>hrs --- --- mins----- | |
| 315 | Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that causes a small increase in breathing or heart rate such as brisk walking,(cycling, swimming, volleyball)for at least 10 minutes continuously? | Yes 1<br>No 2 If No, go to 319 | |
| 316 | In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities | Number of days-------- | |
| 317 | How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day? | Hours minutes<br>----- hrs ------- mins | |
| 319 | How much time do you usually spend sitting or reclining on a typical day? | Hours minutes<br>------ hrs ----- min s | |

**1.4 Health related factors variables**

| Code | Questions | Response | Skip |
|---|---|---|---|
| 401 | Do you have history of any chronic diseases? | 2. Yes<br>3. No | |

| | | | |
|---|---|---|---|
| 402 | Do you have take drug for chonic disease? | 1. Yes<br>2. No | |
| 403 | Do you have taken drug for Treatment of epilepsy? | 3. Yes 2. No | |
| 404 | If you are taking epileptic medicine, which of the following you have taken? | 4. Valproate<br>5. Carbamazepine<br>6. phenytoin<br>7. Phenobarbital<br>8. Others-------- | |
| 405 | Did you have got counselling services on nutrition? | 1.Yes 2. No | |

**1.5 Anthropometric measurement**

| ID | Question | Response | Skip |
|---|---|---|---|
| 501 | Weight of the respondent | _____in kg | |
| 502 | Height of the respondent | _____in cm | |

Thank you.

If you have comment, please----------

## 11 .2 Appendix2

### 11.2.1 Participants information sheet(Amharic version)

**<u>የመረጃ ቅጽ</u>**

ሰላም ደህና አደራችሁ/ዋላችሁ፤ እኔ _____ እባላለሁ፡፡ የመጣሁት የባ/ዳር ዩኒቨርስቲ ጤና ሣይንስ ኮሌጅ የህብረተሰብ ጤና አጠባበቅ ትምህርት ቤት የስርዓተ ምግብና የአመጋገብ ሕክምና ትምህርት ክፍል የሁለተኛ ዲግሪ ተማሪ የሆነውችውን ማስተዋል ታምሩን በመወከል ሲሆን ከት/ት ክፍሉ ፈቃድ በማግኘት ጥናት በማድረግ ላይ ነች፡፡ የጥናቱ ዓላማ በባህር ዳር ከተማ ሆስፒታሎች የሚጥል በሽታን ያለባችውን አዋቂ ሰዎች የአመጋገብ ስርዓታቸው በማየት ከበሽታው ጋር የሚኖሩትን የአመጋገብ ስርዓቱን እንዲያሻሽሉ ትልቅ ሚና ይኖረዋል:: በተጨማሪም ይህ ጥናት የተለያዩ መንግስታዊ፣ መንግስታዊ ያልሆኑ ድርጅቶች እና አጋር ድርጅቶች በሚጥል በሽታ ያለባቸው አዋቂ ሰዎች የአመጋገብ ስርዓት ዙርያ እንዲሰሩና የበኩላቸውን ሚና እንዲጫወቱ መነሻ ይሆናል የሚል ፅኑ እምነት አለኝ:: እርስዎ በዚህ ጥናት ላይ እንዲሳተፉ የተመረጡት በየደረጃው በተደረገ የአጋጣሚ የናሙና አወሳሰድ ስሌት መሰረት ሲሆን ለዚህ ጥናት ዓላማ ሲባል ሆስፒታሉ ውስጥ የሚጥል በሽታ ህክምና ክትትል ከሚያደርጉት የተመረጡ በመሆኑ ነው፡፡ የእርስዎ ተሳትፎ በፈቃደኝነት ላይ የተመሰረተ ሲሆን መልስ ለመስጠት የማይፈልጉበት ጥያቄ ካለ ለመመለስ አይገደዱም፡፡ በቃለ-መጠይቁ ወቅት ያልተምችዎት ነገር ካለ በማንኛውም ሰዓት ጥያቄውን የማቋረጥ መብትዎ የተጠበቀ ነው፡፡ የእርስዎ ስም ከቃለ-መጠይቁ ጋር የማይያያዝ ሲሆን ከዋና አጥኝው በስተቀር ማንም ቃለ መጠይቁን ሊያገኘው አይችልም፡፡ የመረጃው ሚስጥራዊነት የሚጠበቅ ሲሆን ከታሰበለት ዓላማ ውጪ ለሌላ ምክንያት አይውልም፡፡ በጥናቱ ጊዜ ለምናጠናው ጥናት የተወሰኑ ጥያቄዎችን የምጠይቅዎት ሲሆን በዚህ መጠይቅ መሰረታዊ የግል መረጃ፣ የምግብ መረጃ፣ የአመጋገብ ልምድ፣ ከጤና ጋር ተዛማጅ የሆኑ ባህሪያትና አካላዊ እንቅስቃሴ የሚዳሰሱ ይሆናል፡፡

ቃለ-መጠይቁ 25 ደቂቃ ያህል የሚወስድ ይሆናል፡፡ ያስታውሱ፣ የእርስዎ ፈቃደኝነት እና ንቁ ተሳትፎ ለዚህ ጥናት ሰኬት በጣም አስፈላጊ ነው፡፡ ጥናቱ በባ/ዳር ዩኒቨርስቲ ጤና ሣይንስ ኮሌጅ የስነ ምግባር ኮሚቴ ታይቶ የፀደቀ ሲሆን ሰለጥናቱ ተጨማሪ መረጃ ማወቅ ከፈለጉ ዋና አጥኝውን በሚከተሉት አድራሻዎች ማግኘት ይችላሉ፡፡

**የዋና አጥኝው ስም፡ ማስተዋል ታምሩ**

Email: mastewaltamiru2011@gmail.com

**ስልክ፡** 0986373669

**11.2.2 Consent form sheet(Amharic version)**

**የስምምነት ማረጋገጫ ቅጽ**

**የተሰጠዎትን ከላይ ያለውን መረጃ መሰረት በማድረግ በዚህ ጥናት ውስጥ ለመሳተፍ ፈቃደኛ ነዎት?**

**(ሀ) አዎ ……... (1) .... መልሱ "አዎ" ከሆነ ቃለ-መጠይቁን ይቀጥሉ**

**(ለ) አይደለሁም. (2) ... መልሱ "አይደለሁም" ከሆነ ያልተሳተፉበትን ምክንያት ይፃፉና ወደሚቀጥለው ተሳታፊ ይለፉ _____**

**ከላይ የተተቀሰውን መረጃ ግንዛቤ ውስጥ በማስገባት በጥናቱ ላይ እንዲሳተፉ በአክብሮት እጋብዛለሁ፡ ፡ እኔ ከዚህ በታች ፊርማዬ የተቀመጠው በጥናቱ በፍቃደኝነት እንደምሳተፍ የጥናቱን ዓላማ በደንብ ግንዛቤ ውስጥ በማስገባት በሚገባኝ ቋንቋ ከተገለፀልኝ በኋላ በጥናቱ ለመሳተፍ ፍቃደኛ መሆኔን በፊርማዬ አረጋግጣለሁ:**

**የተሳታፊው ፊርማ፡ _____ እለት፡ _____/ቀን/ _____/ወር/ _____/ዓ. ም/**

**ቃለ መጠይቁ የተደረገበት እለት፡ _____/ቀን/ _____/ወር/ _____/ዓ. ም/**

**የተጀመረበት ጊዜ፡ _____/ሰዓት/ ከ_____/ደቂቃ/**

**ያለቀበት ጊዜ፡ _____/ሰዓት/ ከ_____/ደቂቃ/**

**በተቆጣጣሪዎች ተረጋግጧል፡ ፡ ስም፡ _____ ፊርማ: _____**

### 11.2.3 Questionnaire (Amharic Version)

**ማሳሰቢያ፡** ያልገባዎት ነገር ወይም ከጥያቄው ጋር በተያያዘ ችግር ካለ ዋና አጥኚውን በሚከተለው አድራሻ ማግኘት ይችላሉ፡፡

የዋና አጥኚው ስም: አሳዬ አዲስ

| መግለጫ | መለያ |
|---|---|
| ክልል | |
| ዞን | |
| ወረዳ | |
| የሱፐርቫይዘር ስምና ፊርማ | |
| የመረጃ ሰብሳቢው ስምና ፊርማ | |
| የተሳታፊ መለያ ኮድ | |

## 1) ማህበራዊ ፣ ስነ- ህዝባዊ እና ኢኮኖሚያዊ ጥያቄዎች

| ኮድ | ጥያቄዎች | የመልስ አማራጮች | ወደ ሚቀጥለው ተሻገር |
|---|---|---|---|
| 101 | እድሜዎች በአመት ስንት ነው? | _____ | |
| 102 | ፆታ | 1. ወንድ 2. ሴት | |
| 103 | የትዳር ሁኔታ ምንድን ነው? | 1. ያገባ/ች<br>2. ያላገባ/ች<br>3. የፈታ/ች<br>4. የሞተባት<br>5. ሌላ ካለ ይገለፅ —— | |
| 103 | የትምህርት ደረጃዎ ምንድን ነው? | 1. መፃፍ ማንበብ የማትችል<br>2. መፃፍ ማንበብ የምትችል<br>3. 1ኛ ደረጃ/1-8 ክፍል/<br>4. 2ኛ ደረጃ/9- 12 /<br>5. ዲፕሎማና ከዚያ በላይ<br>6. ሌላ ካለ ይገለፅ — | |

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| 104 | የስራ ሁኔታዎ ምንድን ነው? | 1. ነጋዴ<br>2. የመንግስት ሰራተኛ<br>3. የቀን ሰራተኛ<br>4. የቤት እመቤት<br>5. ሌላ ካለ ይገለፅ — | |
| 105 | ሐይማኖትዎ ምንድን ነው? | 1. ኦርቶዶክስ<br>2. ሙስሊም<br>3. ፕሮቴስታንት<br>4. ካቶሊክ<br>5. ሌላ ካለ ይገለፅ—— | |
| 106 | የቤተሰብ አባላት ብዛት ስንት ነው? | _____ (በቁጥር) | |
| 107 | የሚረዳዎት ሰው አለዎት? | 1. አዎ<br>2. የለም | |

## 2) የቤተሰብ የምግብ ዋስትናን የሚዳስሱ ጥያቄዎች

**ማስታወሻ፡-=አልፎ አልፎ** ( 1 ወይም 2 ጊዜ)፣**አንዳንድ ጊዜ** ( ከ 3-10 ጊዜ) እና **ብዙ ጊዜ** ( ከ 10 ጊዜ በላይ)

| | | | |
|---|---|---|---|
| 201 | ባለፉት አራት ሳምንታት ውስጥ ቤተሰብዎ በቂ ምግብ አላገኘም ብለው አስበው (ተጨንቀው) ነበር? | 1. አዎ<br>0. የለም | ጥያቄ 201 የለም ከሆነ፣ ወደ ጥያቄ 202 |
| 201 ሀ | መልስዎ አዎ ከሆነ፣ ምን ያህል ጊዜ ተከስቶ ያዉቃል? | 1. አልፎ አልፎ<br>2. አንዳንድ ጊዜ<br>3. ብዙ ጊዜ | |
| 202 | ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ከቤተሰብ አባልዎ መካከል በገንዘብ እጥረት ምክንያት የመረጣችሁትን ምግብ ሳትመገቡ የቀራችሁበት ጊዜ ነበር | 1. አዎ<br>2.የለም | ጥያቄ 202 የለም ከሆነ፣ ወደ ጥያቄ 203 |
| 202 ሀ | መልስዎ አዎ ከሆነ፣ ምን ያህል ጊዜ ተከስቶ ያዉቃል? | 1.አልፎ አልፎ<br>2. አንዳንድ ጊዜ<br>3.ብዙ ጊዜ | |
| 203 | ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ከቤተሰብ አባልዎ መካከል በገንዘብ እጥረት ምክንያት | 1. አዎ<br>2.የለም | ጥያቄ 203 የለም ከሆነ፣ ወደ ጥያቄ 204 |

| | | | |
|---|---|---|---|
| | ውስን የምግብ አይነት ተመግበዋል? | | |
| 203 ሀ | መልስዎ አዎ ከሆነ፣ ምን ያህል ጊዜ ተከስቶ ያዉቃል? | 1.አልፎ አልፎ<br>2. አንዳንድ ጊዜ<br>3.ብዙ ጊዜ | |
| 204 | ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ከቤተሰብ አባልዎ መካከል በገንዘብ እጥረት ምክንያት ሌሎች የምግብ አይነቶችን ባለማግኘትዎ መመገብ የማይፈልጉትን የምግብ አይነት ተመግበዋል? | =1. አዎ<br>2.የለም | ጥያቄ 204 የለም ከሆነ፣ ወደ ጥያቄ 205 |
| 204 ሀ | መልስዎ አዎ ከሆነ፣ ምን ያህል ጊዜ ተከስቶ ያዉቃል? | 1.አልፎ አልፎ<br>2. አንዳንድ ጊዜ<br>3.ብዙ ጊዜ | |
| 205 | ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ከቤተሰብ አባልዎ መካከል በገንዘብ እጥረት ምክንያት በቂ ምግብ ባለመኖሩ ከሚያስፈልግዎ (ከበቂ) በታች የሆነ ምግብ ተመግበው ያውቃሉ? | 1. አዎ<br>2.የለም | ጥያቄ 205 የለም ከሆነ፣ ወደ ጥያቄ 206 |
| 205 ሀ | መልስዎ አዎ ከሆነ፣ ምን ያህል ጊዜ<br>ተከስቶ ያዉቃል? | 1.አልፎ አልፎ<br>2. አንዳንድ ጊዜ<br>3.ብዙ ጊዜ | |
| 206 | ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ከቤተሰብ አባልዎ መካከል በገንዘብ እጥረት ምክንያት በቂ ምግብ ባለመኖሩ በቀን ውስጥ ከሚያስፈልገዎ ጊዜ በታች ተመግበው ያውቃሉ? | 1. አዎ<br>2.የለም | ጥያቄ 206 የለም ከሆነ፣ ወደ ጥያቄ 207 |
| 206 ሀ | መልስዎ አዎ ከሆነ፣ ምን ያህል ጊዜ ተከስቶ ያዉቃል? | =አልፎ አልፎ<br>=አንዳንድ ጊዜ<br>=ብዙ ጊዜ | |

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| 207 | ባለፉት አራት ሳምንታት በቤተሰብዎ ውስጥ በገንዘብ እጥረት ምክንያት ምግብ ባለማግኘትዎ በቤትዎ ውስጥ ምንም አይነት የሚበላ ምግብ አጥተው ነበር? | 1. አዎ<br>2.የለም | ጥያቄ 607 የለም ከሆነ፣ ወደ ጥያቄ 208 |
| 207 ሀ | መልስዎ አዎ ከሆነ፣ ምን ያህል ጊዜ ተከስቶ ያዉቃል? | 1.አልፎ አልፎ<br>2. አንዳንድ ጊዜ<br>3.ብዙ ጊዜ | |
| 208 | ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ከቤተሰብ አባልዎ መሳከል በገንዘብ እጥረት ምክንያት ምግብ ሳትመገቡ አድራችሁ ታውቃላችሁ? | 1. አዎ<br>2.የለም | ጥያቄ 208 የለም ከሆነ፣ ወደ ጥያቄ 209 |
| 208 ሀ | መልስዎ አዎ ከሆነ፣ ምን ያህል ጊዜ ተከስቶ ያዉቃል? | 1.አልፎ አልፎ<br>2. አንዳንድ ጊዜ<br>3.ብዙ ጊዜ | |
| 209 | ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ከቤተሰብ አባልዎ መሳከል በገንዘብ እጥረት ምክንያት ሙሉ ቀንና ማታ ያለምንም ምግብ መመገብ ያሳለፋችሁት ጊዜ ነበር? | 1. አዎ<br>2.የለም | |
| 209 ሀ | መልስዎ አዎ ከሆነ፣ ምን ያህል ጊዜ ተከስቶ ያዉቃል? | 1.አልፎ አልፎ<br>2. አንዳንድ ጊዜ<br>3.ብዙ ጊዜ | |

## 3) የአመጋገብ ልማድ

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| 301 | ትናንት (በ24 ሰዓት ውስጥ) ስንት ጊዜ ተመግበሃል? | _____ ጊዜ | |
| 303 | ማዕድዎትን ከማን ጋር ነው የሚመገቡት ? | 1. ሁልጊዜ ብቻዎትን<br>2. አንዳንድጊዜ ብቻዎትን<br>3. ሁልጊዜ ከቤተሰብ ጋር<br>4. አንዳንድ ጊዜ ከቤተሰብ ጋር | |

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| 304 | የማዕድ አመጋገብ ጊዜዎ ምን ይመስላል? | 1. ሰዓቱን ጠብቆ ቁርስ፣ ምሳ፣ መክሰስ እና እራት<br>2. በተገኘው ጊዜ ከመመገቢያ ሰዓት ውጭ | |

## 4) የአኗኗር ዘይቤ

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| 501 | ሲጋራ ያጨሳሉ? | 1 አዎ<br>2 የለም | |
| 502 | አልኮል ይጠጣሉ? | 1 አዎ<br>2 የለም | |
| 505 | ጫት ይቅማሉ? | 1 አዎ<br>2 የለም | |
| 506 | ስራዎ ቢያንስ ያለማቋረጥ ለ10 ደቂቃ ከፍተኛ የሆነ የአተነፋፈስ ወይም የልብ ምት መጨመር የሚያስከተሉ "ከፍተኛ ጫና ያላቸው ጠንካራ እንቅስቃሴዎችን[ለምሳሌ፡ ከባድ ሸክም መሸከም ወይም ክብደት ማነሳት፣ እንደ ቁፋሮ ወይም የግንባታ ስራ ወዘተ] ያካትታል? | 1 አዎ<br>2 የለም | |
| 507 | በአንድ ሳምንት ውስጥ፣ ለምን ያህል ቀናት "ከፍተኛ ጫና ያላቸው ጠንካራ እንቅስቃሴዎች"ን የሥራዎ አካል ያደርጋሉ? | ቀናት_____ | |
| 508 | በአንድ ቀን ውስጥ ከፍተኛ ጫና ያላቸው ጠንካራ እስፖርታዊ፣ የአካል ማጎልመሻ ወይም የመዝናኛ እንቅስቃሴዎችን ለማከናወን ምን ያህል ጊዜ ያጠፋሉ? | ሰዓት_____<br>ደቂቃ_____ | |
| 509 | መካከለኛ-ጫና ያላቸው አነስተኛ የልብ ምት እና ትንፋሽ መጨመር የሚስከትሉ እስፖርታዊ፣ የአካል ማጎልመሻ ወይም የመዝናኛ እንቅስቃሴዎች ማለትም እንደ ቀላል የእግር ጉዞ [ወይም ቀላል ሸክም መሸከም ያሉ ተግባራትን] ያለማቋረጥ ቢያንስ ለ10 ደቂቃ ያደርጋሉ? | 1.አዎ<br>2.የለም | |
| 510 | በአንድ ሳምንት ውስጥ፣ ለምን ያህል ቀናት መካከለኛ-ጫና ያላቸው እንቅስቃሴዎች"ን የሥራዎ አካል ያደርጋሉ? | ቀናት-_____ | |
| 511 | በአንድ ቀን ውስጥ መካከለኛ ጫና ያላቸው እንቅስቃሴዎችን ለማከናወን ምን ያህል ጊዜ ያጠፋሉ? | ሰዓት_____<br>ደቂቃ_____ | |

### 5)የጤና ሁኔታ

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| 601 | ከዚህ በፊት ስር የሰደደ(የቆየ) በሽታ እንዳለብዎ ተነግሮዎት ያውቃል? | 1 አዎ<br>2 የለም | |
| 605 | ለህክምና መድሃኒት እየወሰዱ ነው? | 1. አዎ | |

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| | | 2. የለም | |
| 606 | ጥያቄ ቁጥር 605 አዎ ከሆነ፣ የሚወስዱት መድሀኒት ብዛት ስንት ነው? | _____ (በቁጥር) | |
| 607 | መድሃኒት የሚወስዱ ከሆነ የመድሃኒቱ ስም ቢነገረኝ | | |

## 5) የአንትሮፖሜትሪ ልኬት

| ተ.ቁ | ልኬት | የልኬት መጠን |
|---|---|---|
| 801 | የሰዉነት ክብደት ልኬት | _____ኪ.ግ |
| 802 | የቁመት ልኬት | _____ሳ.ሜ |

**ስለ ትብብርዎ እናመሰግናለን!!!**