



POSTGRADUATE PROGRAMS DIRECTORATE

**UNDERNUTRITION AND ASSOCIATED FACTORS AMONG ADULT
CANCER PATIENTS ATTENDING TREATMENT AT HIWOT FANA
COMPREHENSIVE SPECIALIZED HOSPITAL, EASTERN ETHIOPIA**

MPH THESIS

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**Undernutrition and Associated Factors among Adult Cancer Patient
Attending Treatment at Hiwot Fana Comprehensive Specialized
Hospital, Eastern Ethiopia**

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Post Graduate Programs Directorate
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MASTER OF PUBLIC HEALTH IN NUTRITION**

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ACRONYMS AND ABBREVIATIONS

BMI	Body mass index
CNCD	Chronic, Non-Communicable Disease
CV	Curriculum Vitae
GCO	Global Cancer Observatory
GIT	Gastrointestinal tract
HAD	Hospital Anxiety and Depression
HFIAS	Household Food Insecurity Access Scale
HFCSH	Hiwot Fana Comprehensive Specialized Hospital
LIC	Low Income Countries
NCI	National Cancer Institute
PG SGA	Patient Generated Subjective Global Assessment
PCA	Principal Component Analysis
PI	Principal Investigators
SGA	Subjective Global Assessment
TEM	Technical Error of Measurement
UNICEF	United Nation International Children's Emergency Fund
WHO-PS	World Health Organization Performance Status
WHO	World Health Organization

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ABSTRACT

Background: Cancer is the uncontrolled growth of abnormal cells that disrupt normal body function. It's a global public health issue with a rising burden in developing countries. Due to the combined effect of the disease and therapy, cancer patients are susceptible to undernutrition. However, evidence on the prevalence of undernutrition among cancer patients at Hiwot Fana Comprehensive Specialized Hospital is limited, and the factors associated with undernutrition have not been thoroughly investigated. This study, hence, aims to address this evidence gap.

Objective: To assess the undernutrition and associated factors among adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia, from November 25, to December 30, 2024.

Method: An institutional-based cross-sectional study was conducted among 399 cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital in eastern Ethiopia. Participants were selected using Systematic random sampling. Data were collected using structured questionnaires through face-to-face interview and chart review. Patient-Generated Subjective Global Assessment (PG-SGA) tool was used to determine the nutritional status of the patients. Data were analysed using SPSS version 27 software. Binary logistic regression analysis was performed. Multicollinearity and model of fitness were checked. Adjusted odds ratio (AOR) with 95% confidence interval (CI) at $p < 0.05$ were used to declare statistically significant associations.

Results: The study revealed that 56.4% (95% CI: 51.5%, 61.3%) of the cancer patients were undernourished. Age ≥ 55 years (AOR=2.6, 95% CI: 1.405, 4.935), being female (AOR = 1.629; 95% CI: 1.035- 2.553), household food insecurity (AOR=2.685, 95% CI: 1.668, 4.324), low-dietary diversity (AOR=2.218, 95% CI: 1.416, 3.474), Stage four cancers (AOR=2.908, 95%CI: 1.523, 5.554), and performance status (AOR=1.951, 95% CI: 1.225, 3.107) were significantly associated with undernutrition among adult cancer patients.

Conclusion: This study found that more than half of cancer patients were undernourished. Factors significantly associated with undernutrition included age ≥ 55 years, female sex, household food insecurity, low dietary diversity, stage four cancers, and poor performance status. Therefore, Hospital and other stakeholder's should give more attention for implementation of routine screen for all patients prioritizing older age, women. Improve dietary diversity, food security through nutritional intervention.

Keywords: Undernutrition, Adult cancer, Ethiopia

1. INTRODUCTION

1.1. Background

Cancer is characterized by the abnormal growth of certain cells in the body, which proliferate uncontrollably and infiltrate other areas of the body. This unregulated cell growth forms tumors that can disrupt normal bodily functions (Brown et al., 2023). A cancer case can invade adjoining parts of the body and spread to other organs; the latter process is referred to as metastasis and is widespread throughout the body (WHO, 2022).

Nutrition can play a significant role in multimodal care services, as research indicates that nutritional issues should be considered at the time of case being identified, operating simultaneously with anti-tumour medicines within a diagnostic and therapeutic line (Muscaritoli et al., 2021). Due to the combined effect of the disease and therapy, cancer patients are susceptible to undernutrition (Muhammed et al., 2022) that affects their taste, smell, appetite, and absorption and results in them becoming weak, exhausted, and unable to fight infections (Muthike et al., 2015). Both cancer and undernutrition manifest through various conditions attributed to systemic inflammation, muscle mass depletion, weight loss, anorexia, and metabolic alterations. (Andreia Capela, 2023). Currently, cancer is serious public health issue globally, and in many low-income countries (LICs) including Ethiopia (Haileselassie et al., 2019).

According to WHO estimates, one in five people will develop cancer during their life time, with 1 in 9 men and 1 in 12 women will die from the disease (Bray et al., 2024). This is a serious public health problem in low- and middle-income countries (LMIC), particularly in region with limited access to cancer care service (Hernández Vargas et al., 2020). The global cancer burden accounts 19.3 million new cases and 10 million deaths in 2020 and forecast there would be 28.4 million cases of cancer worldwide by 2040 (Deo et al., 2022). Particularly in low- and middle-income countries, cancer-related mortality accounted for almost 70% of reported deaths (Parkin et al., 2020). According to Global cancer observatory (GCO) were estimated to have reported 80,334 (27,713 in men and 52,621 in women) new cases, 54,698 (19,731 in men and 34,967 in women) cancer-related deaths in 2022 in Ethiopia (Wéber et al., 2024).

The cancer disorder is the main leading cause of morbidity and mortality, as cancer statistics done in 2020 in the United States estimated around 1.8 million new cases and 606,520 deaths from the disease (Siegel et al., 2021). In Europe, it is estimated that from a total of 22.8% of cancer cases, they shared 19.6% of cancer deaths, In America, it is estimated that from a total of 20.9% of cancer cases, they also shared 14.2% of cancer deaths of the global population. However, in Asia and Africa, cancer deaths are higher than the share of the incidence this due to late diagnosis , which is the reason for the different types of cancer and the higher case fatality rate on the continents (Sung et al., 2021).

Beside the increasing numbers of population growth, the change in lifestyle was also an attribute of the increasing cases of cancer (Haileselassie et al., 2019), Not only that, but also environmental influences, internal stress, or heredity (Cheung and Vousden, 2022), geographical location and food style an individual are the major factors in many cancers (Feola et al., 2022). Early evaluation of nutritional status provides an opportunity to identify undernutrition or patients at high nutritional risk during the initial stages of medical care. This allows for the establishment of nutritional needs and care plans, as well as the assessment of the most appropriate route of nutrition for cancer patients (Jager-Wittenaar and Ottery, 2017), and support are crucial for reducing complications, stabilizing , and preparing patients for treatment to manage side effects (Mogensen et al., 2019). Therefore, it is essential to consider the nutritional requirements of patients during their hospitalization and chemotherapy treatment as part of their nutritional needs (Mohamed and Abass, 2021).

According to a study by Muscaritoli et al. in 2017, findings revealed that 43% were at risk of undernutrition, and undernutrition severity correlated with disease stage. Additionally, 40% of patients experienced symptoms of anorexia (Muscaritoli et al., 2017). A similar study revealed that individuals with cancer are more prone to undernutrition and experience higher rates of mortality and morbidity compared to well-nourished patients (Loeliger and Kiss, 2015, Ryan et al., 2016). Data concerning the undernutrition of cancer patients is crucial for designing interventions and care plans aimed at reducing mortality and morbidity rates, while simultaneously enhancing treatment outcomes (Parsons et al., 2023).

1.2. Statement of the Problem

Globally prevalence of undernutrition among cancer patients ranging from 20% to more than 70% depending on the type of cancer, stage of the disease, age, and different type of treatment (Beirer, 2021), (Curado et al., 2013, Muscaritoli et al., 2021) , (Sanz et al., 2019). Its vary as evidenced in Nepal and Mexico, the highest prevalence of undernutrition is nearly 50% found in gastrointestinal, head, and neck cancer (Allende-Pérez et al., 2013, Anuj et al., 2022). In Greece, undernutrition among cancer patients was found at 54.9% (Vamvakari et al., 2023) and in Ghana 63% of cancer patient was malnourished (CI et al., 2023). In 2021, in Ethiopia, with hospitalization patients, 58.2% of undernutrition has been seen among cancer patients was found (Gebremedhin et al., 2021). Recent study in hawasa was found 58% of cancer patient undernourished (Worku and Wondimagegne, 2025).

Undernutrition increases hospital stays, risk of cancer recurrence, and low rate of response to treatment (CITY OF HOPE, 2023). Evidence published in the British Medical Journal Lancet in 2023, involving nearly 6,000 adult colorectal and gastric cancer patients, demonstrated unfavourable outcomes characterized by an elevated risk of mortality (Lancet Glob Health, 2023). Undernutrition in cancer patients can lead to poor prognoses, reduced survival, and a poor response to antineoplastic treatments (Ni and Zhang, 2020), Subsequently, the side effects of treatment can significantly diminish the nutrition and energy levels of cancer patients' bodies (Bincy and Chacko, 2014). Factors contribute to undernutrition include, poor daiterly intake, type of cancer, cancer stage, side effects of treatment, depression , anxiety, decrease and gastrointestinal disturbance (Sharma et al., 2015), (Muscaritoli et al., 2017),(Arends et al., 2017).

Maintaining optimal nutritional status through targeted nutritional interventions can improve outcomes for individual with cancer. The American cancer society notes that proper nutrition during treatment supports the immune system, reducing the risk of infection and promoting faster healing and recovery (Arends et al., 2017). Nutrition plays a critical role in health outcomes, particularly among patients with chronic illnesses such as cancer. Recognizing this the Ethiopian government launched the national food and nutrition strategy to reduce undernutrition and improve nutritional care across all population groups including cancer. However, the implementation of this strategy in oncology care settings remains limited, and there is a lack of evidence based data to guide targeted nutritional interventions (MOH et al., 2021).

Undernutrition among cancer patients is well recognized global public health concern. While studies have examined this issue in Ethiopia, evidence from eastern Ethiopia is limited, and no published study has specifically investigated undernutrition and its contributing factors among cancer patients at Hiwot Fana Comprehensive Specialized Hospital Eastern Ethiopia. The lack of context specific data limits design nutritional intervention. This study, therefore, aims to fill the gap by assessing magnitude of undernutrition and associated factors among cancer patients at Hiwot Fana Comprehensive Specialized Hospital in Eastern Ethiopia.

1.3. Significance of the study

This study will provide valuable insights on the prevalence of undernutrition and associated factors among cancer patients at Hiwot Fana Comprehensive Specialized Hospital Eastern Ethiopia. The findings can guide the development of targeted nutritional interventions to improve patient's outcome. Additionally, the study will provide help health care providers implement early screening. Furthermore, the study may serve as baseline information for future researchers.

1.4. Objective of the study

1.4.1. General objective

To assess the undernutrition and associated factors among Adult cancer patients attending Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia, from November 25, to December 30, 2024.

1.4.2. Specific objectives

- To determine prevalence of undernutrition among adult cancer patients attending at Hiwot Fana Specialized Hospital, Eastern Ethiopia.
- To identify factors associated with undernutrition among adult cancer patients attending at Hiwot Fana Specialized Hospital, Eastern Ethiopia.

2. LITERATURE REVIEW

2.1. Prevalence of undernutrition among cancer patients

Undernutrition is a significant concern among cancer patients world wide with varing prevalence varing according to geographical location, cancer type, assesement methods and patients demographic factors. According to a study conducted in Greece among 152 adult cancer patients undergoing treatment based on the PG-SGA assessment, 54.9% were malnourished (Vamvakari et al., 2023). Similarly, Cross sectional study done in Brazil among adult patient with cancer on treatment show that based on the assessments PG-SGA 77% undernourished (Ferigollo et al., 2018). In Thailand, a study conducted among 101 gynecological cancer patients revealed that, based on the Subjective Global Assessment (SGA), 26.7% were undernourished (Sanguanwongthong and Suprasert, 2022).

In Europe, According to study conducted in Belgium among 328 patients showed that the prevalence of undernutrition were 53.8% during treatment (Rasschaert et al., 2024). Another study done in Germany in among 110 patients with undergoing treatment indicated that 45.9% patients were malnourished (Sonneborn-Papakostopoulos et al., 2021) and another cross-sectional study conducted in Poland among 310 cancer patients reported that 18.71% of patients were malnourished (Polański et al., 2021).

In the Middle East and south Asia prevalence also show considerable variability. A cross-sectional study conducted in Yemen among 296 cancer patients revealed prevalence of undernutrition were 16.2%, with a higher rate observed in females compared to males (Al-Shahethi et al., 2023). A descriptive cross-sectional study conducted among 95 cancer patients in Nepal revealed that 23.15% were malnourished (Anuj et al., 2022). A cross sectional study conducted in Palestine among 100 cancer patient reported that the prevalence of undernutrition were 25% (Badrasawi et al., 2021). Another study done in Baghdad among 100 cancer patients, found that 74% were malnourished (Jasim et al., 2023). Several studies conducted across African countries on prevalence of undernourished among cancer patients. In Nigeria prospective cross-sectional study was done among 89 adult cancer patients 60% of undernutrition was found based on a subjective global assessment scale (Ntekim et al., 2017). similar study conducted in Ghana, among 125 cancer patients undergoing treatment , 63% were malnourished (CI et al., 2023). Another study

conducted in Kenya among 512 cancer patients in 2017 on patients undergoing treatment showed that 31% were undernourished (Kaduka et al., 2017).

In Ethiopia, cross-sectional study conducted in Addis Ababa at Tukur Ambesa hospital among 284 cancer patients showed that the prevalence of undernutrition was 58.2% (Gebremedhin et al., 2021). Another study In Hawassa Comprehensive Specialized Hospital, a study conducted among 324 cancer patients revealed that 48.1% were malnourished (Muhammed et al., 2022). Similarly, a study at Jimma Medical Center among 176 cancer patients reported prevalence of malnutrition 61.3% (Enkobahry et al., 2023). More recently, a cross-sectional study conducted in Hawassa among 393 cancer patients reported that 58% were undernourished (Worku and Wondimagegne, 2025).

2.2. Factors associated with undernutrition among cancer patients

2.2.1. Sociodemographic factors

According to Karami et al., a study conducted in Iran among 71 cancer patients receiving treatment showed that age and gender were associated with undernutrition ($p=0.043$), ($p=0.033$) (Karami et al., 2021). Other study in Bangladesh show that female cancer patients more likely to be undernourished than male patients (Mohsin et al., 2024). Study in Palestinian show that patients being older associated with undernutrition (Hamdan et al., 2022). Other study conducted in Yemen among 296 cancer patients found that marital status, single $p=0.037$ or (AOR=12.93, 95% CI: 1.17-142.77) and widowed $p=0.045$ (AOR=11.51, 95% CI: 1.05-126.03) were associated with undernutrition (Al-Shahethi et al., 2023). Descriptive study conducted in Egypt among 194 cancer patients showed that illiteracy ($p=0.014$), residence associated with undernutrition (Abd Allah et al., 2020). The study conducted in China among patients with cancer in the study show that being farmer associated with nutritional risk in cancer patients farmer was higher than other occupations (Song et al., 2019). In Ethiopia, a cross-sectional study conducted in Hawassa among 324 cancer patients revealed that patients that have Lowest wealth index were 94% less likely to be wellnourished AOR 0.06 (0.016–0.2) compared to patients with richest (Muhammed et al., 2022).

2.2.2. Clinical related factors

Study conducted in Egypt among 194 cancer patient receive treatment showed that comorbidities and stage four at the diagnosis ($p=.003$) associated with undernutrition (Abd Allah et al., 2020). Cross sectional study done in china in among cancer patient family history (OR: 1.840, 95% CI: 1.132-2.992) are associated with undernutrition (Cao et al., 2021). Cross sectional Study in Ethiopia, Tukur Ambesa Hospital from 347 adult cancer patients indicated that the performance status of ≥ 2 were 2.01 times likely to be at risk of undernutrition [AOR = 4.01, 95 % CI (1.16, 3.49)] and cancer stage II, III & IV were significantly associated with undernutrition (Worku et al., 2021). Similar study in Addis Ababa at Tukur Ambesa hospital from 284 cancer patients showed that the Stage four cancer (AOR 7.2, 95% CI: 1.3–38.5) were significantly associated with undernutrition (Gebremedhin et al., 2021). Others study conducted in kenya show that stage 4 patients were significantly ($p < 0.001$) malnourished compared to patients in the other stages (Kaduka et al., 2017) . Other study conducted in Yemen among 296 cancer patients found that stomach (AOR=6.77, 95% CI: 1.66-27.70), and breast cancer (AOR=2.60, 95% CI: 1.12-6.03) were associated with undernutrition (Al-Shahethi et al., 2023).

2.2.3. Dietary related factors

Several studies have reported that food insecurity and poor dietary practice are significant predictors of undernutrition among cancer patients, in Kentucky among 115 cancer patients receiving treatment showed that food insecure patients were associated with a high level of nutritional risk when compared to food secure patients (Simmons et al., 2006). Other study show that food insecurity associated with undernutrition (Motlagh, 2013). Similarly Food insecurity $p=0.001$ AOR 0.1 (0.05–0.24) associated with risk of undernutrition in cancer patients (Muhammed et al., 2022). Cross- sectional study conducted in hawasa among 393 cancer patients show that the odd of undernutrition were more than four times higher among those low dietary (Worku and Wondimagegne, 2025).

2.2.4. Behavioral characteristics

Study conducted in china shows that smoking (OR: 2.868, 95% CI 1.660-4.954), drinking alcohol (OR: 1.726, 95% CI: 1.099-2.712), are associated with undernutrition in cancer patient (Cao et al., 2021). According to chabowski et al, an evidence survey of 257 patients conducted in hospitals found that anxiety and depression ($P<0.001$ and $P<0.001$, respectively) were associated with undernutrition among adult lung cancer patients (Chabowski et al., 2018).

2.3. Conceptual Framework

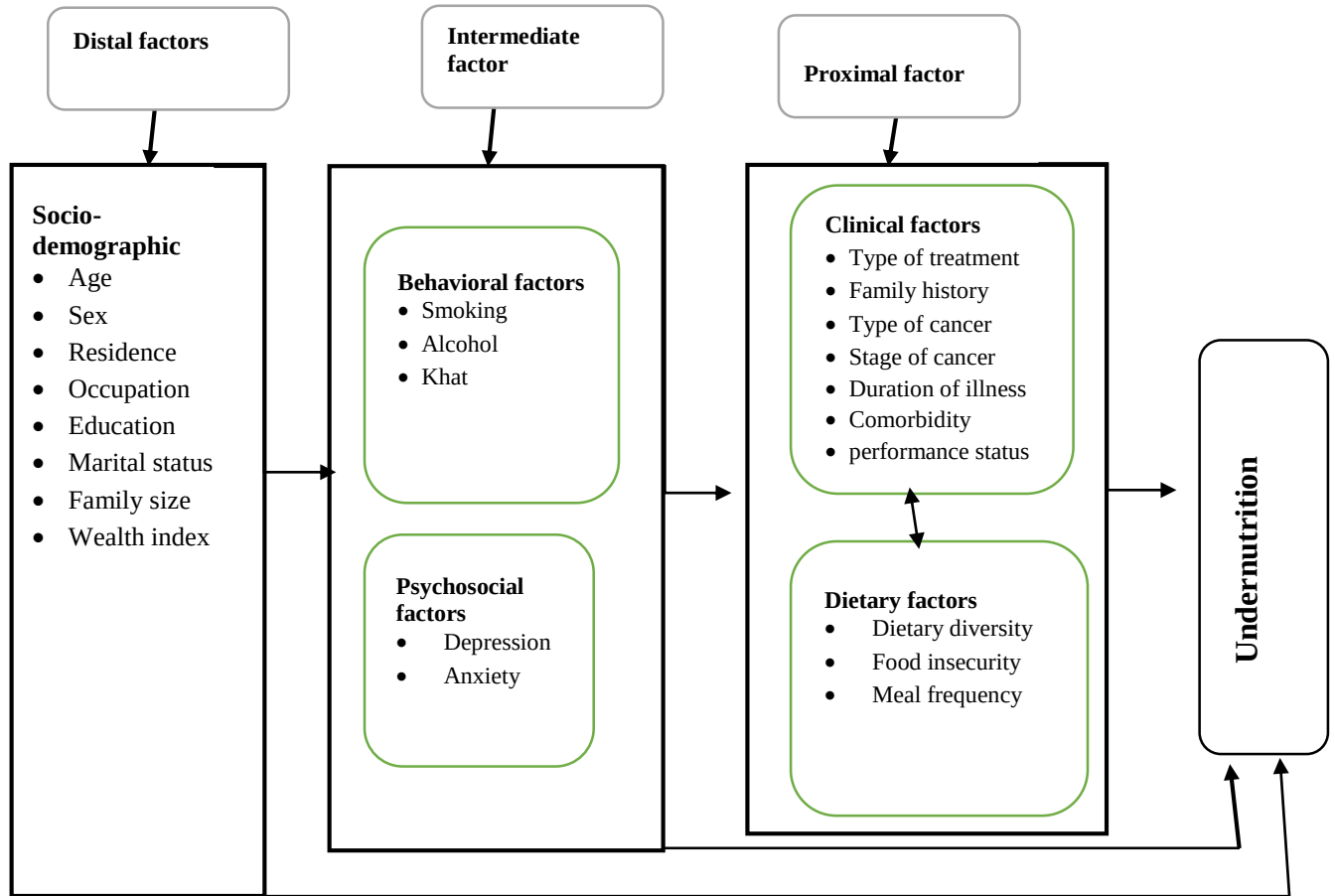


Figure 1: This Conceptual frame work for undernutrition and associated factors among cancer patient attending treatment at Hiwot Fana Comprehensive Specialized Hospital Developed by reviewing literature.

3. MATERIALS AND METHODS

3.1. Study Area and Period

The study was conducted at Hiwot Fana Comprehensive Specialized Hospital located in Harar town Eastern Ethiopia. Harar is the capital city of Harari regional state the region is located in eastern Ethiopia, at a distance of 526 km from Addis Ababa. Hiwot Fana specialized hospital has established in 1941 and it's the only comprehensive specialized hospital serving more than 5 million people in Eastern Ethiopia. Currently it contains medical, surgical, central ICU, adult emergence or emergence and critical care center (HARME), paediatrics, neonatal, psychiatry, gynaecological, obstetrics, oncology, orthopaedics, ophthalmology, units and has 22 outpatient department. The cancer treatment center provides cancer care services through seven physicians (three senior and four GP doctors) and ten nurses (HR, 2024). The study was conduct from November 25, to December 30, at cancer treatment center at Hiwot Fana Comprehensive Specialized Hospital, 2024.

3.2. Study Design

An institution based cross-sectional study was conducted.

3.3. Population

3.3.1. Source Population

The source populations of this study were all adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia.

3.3.2. Study population

The study population were adult cancer patient's ≥ 18 years who were attending treatment at Hiwot Fana Comprehensive Specialized Hospital and fulfils the inclusion criteria during the data collection period.

3.4. Inclusion and Exclusion Criteria

3.4.1. Inclusion Criteria

Cancer patient's age ≥ 18 years diagnosed with any form of cancer who were receiving cancer treatment at HFCSH oncology center during data collection period.

3.4.2. Exclusion Criteria

Those severely ill and could not respond to the questionnaire and unable to obtain a weight and height measurement.

3.5. Sample Size Determination

Sample size was determined by using two formula. For the first objective, The sample size were calculated by using single population formula with a 5% margin of error (d) and a 95% confidence interval ($\alpha = 0.05$), and the prevalence of (58.2%) undernutrition in cancer patients in done at TASH (Gebremedhin et al., 2021).

$$n = (Z_{\alpha/2})^2 \cdot p(1-q) / d^2$$

Where

n_i = initial sample size. $Z_{\alpha/2} = 1.96$ (Z = score corresponds to 95% confidence level).

P = proportion of affected of undernutrition of cancer patients.

q = proportion of not affected of undernutrition of cancer patients.

d^2 = margin of error (0.05)

$$n = [(Z_{1-\alpha/2})^2 \cdot p \cdot (1-p)] / d^2$$

$$n = [(1.96)^2 \cdot 0.582 \cdot (0.416)] / (0.05)^2$$

$$n = (1.96)^2 \cdot 0.582 \cdot (0.418) / (0.05)^2 =$$

$$n = 374$$

After adding 10% of non-response rate (37) the final sample size $374 + 37 = 411$

Sample size estimation for second objective

The sample size for the second objective was determined by using double proportion formula according to factor significantly associated with the outcome variables (undernutrition). The calculation was performed was performed using Epi info 7.2.6.0 software, with the following assumptions: 80% power, 95% confidence level, and 1:1 ratio of exposed to unexposed.

Table 1: Sample size determination for factors associated with undernutrition among cancer patients

Variable								Reference
	AOR	Undernourished P1 (% of outcome in Exposed)	Normal P2 (% of Unexposed)	Ratio	Power	CL	Sample size	
Stage of cancer	AOR = 7.2	Stage 4 (74.7%)	Stage 1 (38.5%)	1:1	80 %	95 %	48	(Gebremedhin et al., 2021)
Food security	AOR =0.1	Insecure (80.19%)	Secure (33.6%)	1:1	80 %	95 %	70	(Muhammed et al., 2022)
Wealth Index	AOR =0.3	Lowest (81.13%)	Highest (19.5%)	1:1	80 %	95 %	26	(Muhammed et al., 2022)

Finally, the sample size for the second objective which was calculated for the factors associated with undernutrition is less than the first objectives. Hence, the sample size of the first objective is taken as the final sample size.

3.6. Sampling techniques and procedure

A systematic random sampling technique was used to select study participants on average 862 cancer patients were receiving treatment per month at the hospital. The sampling interval (K) value was determined by dividing total patients on attending treatment in one month by dividing the total sample size. $K = N/n$, $862/411 \sim 2$. The first participant was randomly chosen from the first two patients by applying lottery method one was chosen. Subsequently, every other patients who met the inclusion criteria was selected until the required sample size was reached.

3.7. Data Collection Methods

3.7.1. Data collection tools/instruments

In this study Data were collected through face-to-face interviews structured questionnaires and reviewing patient chart. The questionnaire consists of five parts. The first part addresses the Socio-demographic factors, the second part addresses clinical information such as cancer type, stage, type of treatment, duration of illness, and comorbidities was extracted from patient medical chart. The third part addresses dietary assessment factors included dietary diversity which was assessed by using (FAO) Food and Agriculture Organization for measuring individual dietary diversity score (Kennedy et al., 2011), and Household food insecurity which was assessed using the Household Food Insecurity Access Scale tools (Coates et al., 2007). The fourth part addresses Behavioral and psychosocial factors including Anxiety and depression levels of the patients were measured by using the hospital anxiety and depression scale (Wondie et al., 2020), while The World Health Organization Performance Status (WHO-PS) questionnaire was used to assess patients' performance status. Finally, Undernutrition was measured by using Patient Generated Subjective Global Assessment (PG-SGA) tool, that focusing on weight loss, food intake, symptoms and functional activities and Addressing scoring the percentage of weight, disease and its relation to nutritional requirements, metabolic demand, physical examination. The Amharic version of PG-SGA tools was checked for validity (content and linguistic) for application among cancer patients in Ethiopia, the content validity was 0.97 with modified kappa value ranging from 0.87 to 1 (Seid et al., 2024). The PG-SGA use for nutritional assessment of cancer patients is well established in previous studies globally, (Jager-Wittenaar and Ottery, 2017, Mendes et al., 2019), (Bauer et al., 2002) and in Ethiopia (Seid et al., 2025).

3.7.2. Data collectors and supervisors

Three data collectors (BSc nurses) and one individual with master's degree of adult health nursing for supervision activities were recruited. The data collectors were selected from Hiwot Fana Comprehensive Specialized Hospital Cancer treatment Center, prioritizing individuals with experience in data collection. The data collectors and supervisors, they were given training for 2 day on contents of the tools (PG-SGA) and methods of extracting the needed information, how to fill the information on structured questionnaire and the ethical aspect in approaching the participants as well as the aim of the study.

3.7.3. Data collection procedure

The Data was collected through face-to-face interviews using by pre tested structured questionnaire and chart review. The data was collected after participants get the service they required from the doctors. Before the commencement of data collection, the interviewers explained the objective of the study and get informed consent to conduct the interview, and consented patients who fulfill the eligibility criteria were included in the study.

Anthropometric measurements

Anthropometric measurements, including weight and height, were taken using standardized procedures and calibrated equipment.

Body Mass Index (BMI): The weight was measured to the nearest 0.1 kg using an electronic portable scale (Seca). To ensure measurement accuracy, the scale was checked for zero reading and calibrated before each weighing. Height was measured in a standing position to the nearest 0.5 cm using a portable stadiometer. Participants were instructed to stand without shoes, with their back against the scale, heels together, and head in an upright position. The movable headboard was lowered until it touched the upper part of the participant's head firmly (Gebregergs et al., 2013). Since BMI is not a direct measurement but rather an index derived from measured weight and height, it was calculated using the formula: $BMI = \text{weight (kg)} / \text{height (m)}^2$. BMI classifications were as follows: underweight ($BMI < 18.5 \text{ kg/m}^2$), normal weight ($BMI 18.5\text{-}24.9 \text{ kg/m}^2$), overweight ($BMI 25\text{-}29.9 \text{ kg/m}^2$), and obesity ($BMI \geq 30 \text{ kg/m}^2$) (Weir and Jan, 2023).

Individual Dietary diversity score: dietary diversity of the respondents assessed using (FAO) Food and Agriculture Organization guidelines for measuring individual dietary diversity (Kennedy et al., 2011). The individual dietary diversity score of indicate the likelihood of a diets micronutrients adequacy as result of use nine food groups such as starch staples, dark green leafy vegetables, other vitamin-A-rich fruits and vegetables, other fruits and vegetables, legumes, nuts and seeds, meat and fish, organ meat, egg, and milk and milk products. The dietary diversity of participants was determined by all foods items consumed both in and out of home at breakfast then lunch and dinner while snacks were considered to be eaten before and after the main meal breakfast, lunch and dinner. The participants received one point for each food groups they consumed at least once during the 24-hours period and zero if they did not consume any items from

that group. The mean individual dietary diversity score was considered as cut of point (Kennedy et al., 2011).

3.8. Study Variables

3.8.1. Dependent Variables

Undernutrition among cancer patient (undernourished /normal)

3.8.2. Independent Variables

Socio- demographic factors age, sex, residence, occupation status, marital status, educational status, and family size and Wealth index.

Clinical factors: family history, type of cancer, stage of cancer, Comorbidities, duration of illness and performance status.

Dietary factors: Food insecurity status, dietary diversity and meal frequency

Behavioral and psychosocial factors: alcohol consumption, cigarette smoking, chat chewing, and anxiety and depression.

3.9. Operational Definition

Undernutrition :The Patient Generated Subjective Global Assessment (PG-SGA) was used to assess undernutrition of cancer patients this tool is validated in Ethiopia (Seid et al., 2024). The tool is divided into two parts with a total of seven sub-sections. The first parts consists of four sub-sections: (1) body weight, (2) food intake (3) symptoms affecting oral food intake, and (4) activities and function filled out by asking the patients, while the second part includes three sub-sections (1) disease, (2) metabolic stress, and (3) the result of physical examination. The final PG-SGA score is the sum of the scores of the seven sub-sections. Undernutrition was defined as total PG-SGA score of 4 or higher, where as scores below 4 indicated well-nourished (Hu et al., 2018) (Seid et al., 2025, Hu et al., 2018) (Guo et al., 2020) (Nakyeyune et al., 2022, Tan et al., 2024, Zhang et al., 2022, Zheng et al., 2024).

Performance status: is the assessment of the level of function and ability of self-care using the World Health Organization Performance Status measuring scale ranging from 0 (fully active) to 4 (bedridden). It used to assess how the condition affects the patient's ability to perform daily duties, which are graded on a scale of 0 (completely active) to 4 (bedridden), with a score of 0–1 indicating good status and 2–4 indicating poor status (Azam et al., 2020).

Wealth index: was constructed based on 26 household assets/properties. Descriptive frequency analyses were conducted to select the variables. Principal component analysis was applied to generate wealth index score and rank households based on their assets. Finally, the patients' households were classified into terciles as poor, middle and rich (Alene et al., 2020).

Food insecurity: was measured by the Household Food Insecurity Access Scale (HFIAS), which consists of nine occurrence questions that represent a generally increasing level of severity of food insecurity (access) and nine frequency -of-occurrence questions that measures the severity of food insecurity in the last four weeks in terms of Likert scale responses 1 = rarely (once or twice), 2 = sometimes (three to ten times), 3 = often (more than ten times). The cumulative score of the nine items ranged between 0-27, and a higher HFIAS score indicated more food insecurity the household experienced (in terms of access to food) (Coates et al., 2007). The cumulative HFIAS score was categorized into four levels of household food insecurity: food secured (0-1), and mild (2-8), moderate (9-16), and severe food insecurity (>17) (Coates et al., 2007, Derby et al., 2022) (Gebreyesus et al., 2015).

The hospital anxiety and depression (HAD): is a brief patients self report measure of anxiety and depression requiring patients to report their symptoms during the previous week. Its consists of 14 items divided into two subscales (anxiety and depression), each with seven items, and is scored on a four-point Likert scale ranging from 0 to 3 Each subscale's total score will runs from 0 to 21 for each two subscale (Sánchez-Torralvo et al., 2022). Possible presence of anxiety in this study is defined as cut-off point ≥ 8 HADS A-7 and possible presence of depression in this study is defined as a cut-off point ≥ 8 HADS D-7 (Abraham et al., 2022).

Dietary diversity score was calculated by computing of food groups consumed over 24 hours. Total individual food score were first categorized in to two categories; score below the mean value were considered low dietary diversity score and score above the mean value were considered high

dietary diversity score. Low dietary diversity when individuals consume less than five food groups. High dietary diversity when individuals consume ≥ 5 food groups (Kennedy et al., 2011).

Comorbidity: refers respondents with one or more medical conditions in addition to cancer.

3.10. Data Quality Control

To ensure data quality data collectors and supervisors received proper training, and data collectors were monitored daily until the completion of data collection. The questionnaire was initially prepared in English, then translated into Afaan Oromo and Amharic for local relevance, before being re-translated into English to maintain consistency. A pre- test was conducted prior to actual data collection with 5 % of the sample size at Hiwot fana hospital.

During the data collection process, supervisors closely monitored field activities daily on basis reviewed the collected data to ensure consistency, completeness, and missing information at each point. Additionally, quality control measures for anthropometric assessments were strictly followed to reduce inaccuracies in weight and height measurements. Instruments were regularly calibrated and readjusted to zero, ensuring precise measurements. Participants were instructed to remove heavy clothing to prevent measurement distortions. Furthermore, Data was checked during entry and compilation before analysis

3.11. Data Processing and Analysis

Data was entered in to Epidata version 3.1 to be clean then it was exported to SPSS version 27 for analysis. Descriptive statistics (frequency distributions, mean, and median with interquartile range, and standard deviation were used to the summarize the data. Result were presented table and figure. Frequency and percentage were calculated for all categorical variables, socidemographic, household wealth index, food insecurity categories, dietary diversity classifications, and anxiety and depression. Means and standard devations were computed for countines variable to summaries overall characteristics of the study participants.

A wealth index was constructed through Principal Component Analysis (PCA) on household assets and properties, categorizing households into poor, middle and rich. Food insecurity was, assessed using the households food insecurity asscess scale (HFIAS) and classified in to categories: Food

Secure, Mildly Food Insecure, Moderately Food Insecure and Severely Food Insecure then categories into secured and insecure. Dietary diversity was assessed using the dietary diversity score representing the number of food groups consumed within the previous 24 hours and categorized low and high. The anxiety and depression were computed and categorized accordingly.

The total PG-SGA score was computed from the seven subsection a score of 4 or higher undernourished, whereas scores below 4 indicated well-nourished. The dependent variable was dichotomized into “1” for undernourished and “0” for wellnourished. Binary logistic regression analysis was fitted to determine factors associated with undernutrition. Variables that fall with the p-value <0.25 was considered for multivariable analysis to control for confounding effects and an adjusted AOR with the 95% confidence interval was calculated. Finally, variables with P-values <0.05 in multivariable analysis was considered to have a statistically significant association. Multicollinearity among independent variables was assessed using Variance Inflation Factors ($VIF < 5$) and model of fitness were checked. Model fitness were checked using the Hosmer and Lemeshow statistic test p value for the test were 0.72 greater than 0.05 indicating a good fit.

3.12. Ethical Considerations

The study protocol was reviewed and approved by the Institutional Health Research Ethics Review Committee (IHRERC) of Haramaya University, College of Health and Medical Sciences with Ref. No: IRERC/208/2024. All research processes were started after obtaining written permission from the School of Postgraduate Studies of Haramaya University. A permission letter obtained from the school of graduate studies was submitted to Hiwot Fana Comprehensive Specialized Hospital. The study title, purpose, procedure, duration, possible risks, and benefit of the study was clearly explained to the participants using local language. Informed, voluntary, written and signed consent was obtained before the initiation of the study both from the participants and hospital head. Only those with signed written consent participated in the study and they were told that they had full right to discontinue the process every time they want. The confidentiality of their responses was kept throughout the study process. The personal privacy and cultural norms of the participants were respected during data collection

3.13. Dissemination of the Results

The result of this study will be submitted and presented to Haramaya University College of Health and medical sciences, school of graduate studies After it is accepted by the university, copies of the finding will be submitted to Hiwot Fana Comprehensive specialized hospital the finding will also be presented in different seminars, meeting, and will be published in local and an international journal.

4. RESULTS

4.1. Socio-demographic characteristics

Of the calculated 411 samples in the study, 399 participant with a 97.1% response rate were included for analysis. The mean ($\pm$ SD) age of adult cancer patient involved in the study was 46.98($\pm$ 13.70) years old. One hundred eight-eight (47.1%) of the participants were aged between 35-54 years. The majority of the participants were female 246 (61.7%) and the most 287(71.9%), were currently married, and nearly half, 205(51.7%) had no formal education.

Table 2: Sociodemographic characteristics of adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia, 2025 (n=399)

Variable	Category	Frequency	Percentage (%)
Age (in years)	18-34	77	19.3
	35-54	188	47.1
	$\geq$ 55	134	33.6
Sex	Male	153	38.3
	Female	246	61.7
Educational level	No formal education	205	51.7
	Primary (1-8)	93	23.0
	Secondary (9-12)	62	15.5
	Higher education	39	9.8
Main occupation	Government employee	23	5.8
	Self-employed	55	13.8
	Student	27	6.8
	Farmer	100	25.1
	Merchant	54	13.5
	Housewife	120	30.1
	Other	20	5.0
Marital status	Married	287	71.9
	Single	45	11.3

	Widowed	39	9.8
	Divorced	28	7.0
Residence area	Rural	234	58.6
	Urban	165	41.4
Family size	≥ 5	220	55.1
	< 5	179	44.9
Wealth index	Poor	133	33.3
	Medium	136	34.1
	Rich	130	32.6

4.2. Clinical characteristics

Only 43 (10.8%) of participants had family history of cancer while another few, 61(15.3%) of the participants had comorbidity. One-hundred twenty-two (30.6%) of the participants had stage 4 cancers, 262(65.7%) of patients had cancer duration of illness greater than two years and nearly half (47.6%) of the participants had been receiving chemotherapy. According to BMI cut point 173 (44.3%) underweight, 194(48.6%) normal and 32(8%) were obese/overweight respectively. Most of the participants had 259 (64.9%) poor performance status. (Table 3)

Table 3: Clinical characteristics of adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia, 2025 (n=399).

Variable	Category	Frequency	Percentage (%)
Family history of cancer	Yes	43	10.8
	No	356	89.2
Comorbidity	Yes	61	15.3
	No	338	84.7
Type of cancer	Breast Cancer	73	18.3
	Cervical Cancer	43	10.8
	Ovarian Cancer	40	10.0
	Gastric Cancer	47	11.8

	Lung Cancer	45	11.3
	Liver Cancer	59	14.8
	Esophageal Cancer	50	12.5
	Colorectal cancer	27	6.8
	Other	15	3.8
Stage of Cancer	Stage 1	79	19.8
	Stage 2	88	22.1
	Stage 3	110	27.6
	Stage 4	122	30.6
Duration of illness (yr)	>2	137	34.3
	≤2	262	65.7
Type of treatment	Chemotherapy	190	47.6
	Radiotherapy	37	9.3
	Chemo+radiotherapy	55	13.8
	Chemotherapy and surgery	57	14.3
	Chemo+radiotherapy+surg	60	15.0
BMI	Underweight	173	43.4
	Normal	194	48.6
	Overweight	32	8.0
	Mean (±SD) BMI	19.30(±3.65)	
performance status	Good	140	35.1
	Poor	259	64.9

4.3. Dietary characteristics

The majority (79.2%) of the participants were eat less than three times per a day. The median Household Food Insecurity Access Scale (HFIAS) score in this study was 6 with an interquantile range (IQR) of 12. This study found, 125 (31.3%) of respondents were food secure, 121 (30.3 %) of respondents mildly insecure, 133 (33.3%) of respondents modratly insecure and 20 (5%) severely insecure.

The mean ($\pm$ SD) dietary diversity score was 4.38 ($\pm$ 1.405). Majority of participants 231 (57.9%) and 226 (56.6%) did not use eggs and legumes nuts seeds respectively. Moreover, 258 (64.7%) and 215 (53.9%) of the participants consumed starch staples and other vitamin A rich fruit and vegetables respectively. The majority of the participants and more than half (58.6%) of participants had low individual dietary diversity (Table 4).

Table 4: Dietary characteristics of adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia, 2025 (n=399).

Variable	Category	Frequency	Percentage (%)
Meal frequency	>3	83	20.8
	$\leq$ 3	316	79.2
Household food security status	Food secure	125	31.3
	Mild Food Insecure	121	30.3
	Moderate Food Insecure	133	33.3
	Severe Food Insecure	20	5.0
Individual dietary diversity score	Low	234	58.6
	High	165	41.4

4.4. Behavioral characteristics

Few, 73(18.3%) of participants were alcohol drinkers, 178(44.6%) of the participants were Khat chewers and 105(26.3%) of the participants were Cigarette smokers. The mean (SD) anxiety and depression subscale scores was 8.75 $\pm$ 3.613 and 8.52 $\pm$ 3.20) respectively. The majority of the participants 227 (56.9%) and 220 (55.1%) showed anxiety and depression respectively. (Table 5).

Table 5: Behavioral characteristics of adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia, 2025 (n=399).

Variable	Category	Frequency	Percentage (%)
Alcohol drinking	No	326	81.7
	Yes	73	18.3
Khat Chewing	No	221	55.4
	Yes	178	44.6
Cigarette smoking	No	294	73.7
	Yes	105	26.3
Anxiety	No	172	43.1
	Yes	227	56.9
Depression	No	179	44.9
	Yes	220	55.1

4.5. Parameters Patient generated subjective global assesement score

According to the PG-SGA weight loss component, one hundred fifty one (37.8%) of the participants experienced weight loss of 0-1.9%, 106(26.6% of the participants had a weight loss 3-4.9%, and 83(20.8%) experienced a weight loss of $\geq 5\%$. The median score of the PG-SGA food intake component was 1, with an interquartile range (IQR) of 2. The median score for the symptoms component was also 1, with an interquartile range (IQR) of 4. Additionally, 91 (22.8%) of the participants experienced mild stress. On physical examination finding indicated that 108(27.1) participants had a mild deficit.

4.6. Undernutrition of Adult Cancer Patients

The median of PG-SGA score of the study participants was five, with an interquartile range (IQR) of nine. According to the PG-SGA, the prevalence of undernutrition of adult cancer patients in Hiwot Fana Comprehensive Specialized Hospital was 225 (56.4%, 95% CI: 51.1%, 61.2%) (Figure 2). The prevalence of undernutrition was higher among female patients 65.3% than among male patients 34.7%. And undernutrition was higher among stage four patients 37.8% than stage one 13.8% patients.

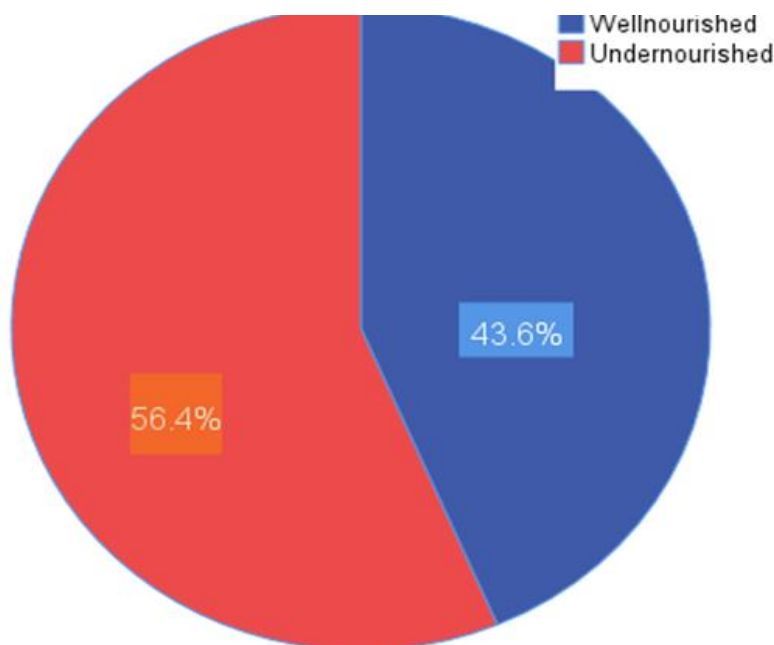


Figure 2: Undernutrition of adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia, 2025 (n=399).

4.7. Factors Associated with Undernutrition of Adult Cancer Patients

In the Bivariable logistic regression analysis age, sex, educational status, food insecurity, cancer stage, low dietary diversity, comorbidity, alcohol, family history of cancer, meal frequency and poor performance status were found to be associated with undernutrition among adult cancer patients at $P < 0.05$ (Table 6). These variables were subsequently included in the multivariable logistic regression analysis.

Table 6: Bivariable logistic regression of factors associated with undernutrition among adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia (n=399).

Variables		Undernourished	Normal	COR (95% CI)	P-value
		N (%)	N (%)		
Age (in years)	18-34	35(45.5)	42(54.5)	1	
	35-54	100(53.2)	88(46.8)	1.3 (0.8, 2.3)	0.253
	≥55	90(67.2)	44(32.8)	2.4 (1.380, 4.3)	0.001
Sex	Female	147(59.8)	99(40.2)	1.4 (0.951, 2.140)	0.086
	Male	78(51.0)	75(49.0)	1	
Educational status	Illiterate	123(60.0)	82(40.0)	1.3 (0.910, 2.0)	0.135
	Literate	102(52.6)	92(47.4)	1	
Occupational status	Unemployed	183(57.0)	138(43)	1.13 (0.691, 1.868)	0.613
	Employed	42(53.8)	36(46.2)	1	
Marital status	Unmarried	67(59.8)	45(40.2)	1.2 (0.780, 1.894)	0.388
	Married	158(55.1)	129(44.9)	1	
Residence area	Rural	135(57.7)	99(42.3)	1.1 (0.761, 1.698)	0.532
	Urban	90(54.5)	75(45.5)	1	
Family size	≥5	129(58.6)	91(41.4)	1.2 (0.823, 1.824)	0.3
	<5	96(53.6)	83(46.4)	1	
Wealth index	Poor	80(60.2)	53(39.8)	1.2 (0.793, 2.110)	0.3
	Medium	75(55.1)	61(44.9)	1.054(0.650, 1.708)	0.83
	Rich	70(53.8)	60(46.2)	1	
Household food security	Insecure	175(63.9)	99(36.1)	2.652(1.717, 4.095)	0.001
	Secure	50(40.0)	75(60.0)	1	
Dietary diversity	Low	150(64.1)	84(35.9)	2.143(1.427, 3.218)	0.001
	High	75(45.5)	90(54.5)	1	
Alcohol	Yes	46(63.0)	27(37.0)	1.399 (0.829,2.360)	0.208
	No	179(54.9)	147(43.1)	1	

Family history of cancer	Yes	28(65.1)	15(34.9)	1.5 (0.778, 2.918)	0.22
	No	197(55.3)	159(44.7)	1	
Comorbidity	Yes	42(68.9)	19(31.1)	1.8 (1.046, 3.353)	0.03
	No	183(54.1)	155(45.9)	1	
Type of cancers	GIT cancer	69(55.6)	55(44.4)	1.045 (0.682, 1.602)	0.840
	Other cancer	156(56.7)	119(43.3)	1	
Stage of cancer	1 st stage	31(39.2)	48(60.8)	1	
	2 nd stage	47(53.4)	41(46.6)	1.775 (0.959,3.286)	0.068
	3 rd stage	62(56.4)	48(43.6)	2.000 (1.111,3.601)	0.021
	4 th stage	85(69.7)	37(30.3)	3.557 (1.964,6.443)	0.001
Duration of illness (yrs)	>2	78(56.9)	59(43.1)	1.034(0.682, 1.569)	0.874
	≤2	147(56.1)	115(43.9)	1	
Type of treatment	Chemotherapy	109(57.4)	81(42.6)	1	
	Radiotherapy	23(62.2)	14(37.8)	1.221(0.592, 2.518)	0.589
	Chemo +radiation	33 (60)	22(40)	1.115(0.605,2.054)	0.728
	Chemo +surgery	29(50.9)	28(49.1)	0.770(0.425,1.393)	0.387
	Chem+radi+surg	31(51.7)	29(48.3)	0.794(0.444,1.422)	0.438
Meal frequency	<3	185(58.5)	131(41.5)	1.518(0.934, 2.466)	0.091
	≥3	40(48.2)	43(51.8)	1	
Anxiety	Yes	133(58.6)	94(41.4)	1.230(0.825, 1.834)	0.309
	No	92(53.2)	80(46.8)	1	
Depression	Yes	129(58.6)	91(41.4)	1.226(0.823, 1.824)	0.316
	No	96(53.6)	83(46.4)	1	
Performance status	Poor	165(63.7)	94(36.3)	2.340(1.538,3.561)	0.001
	Good	60(42.9)	80(57.1)	1	

After adjusting for potential confounders in the multivariate analysis older age, sex, food insecurity, low-dietary diversity, stage of cancer and poor performance status were significantly associated with undernutrition among cancer patients ($p<0.05$).

Accordingly, Patients aged ≥ 55 years had 2.6 times higher odds of undernutrition compared to those aged 18-34 years (AOR=2.6, 95% CI: 1.405, 4.935). Female cancer patients had 1.62 times higher odds of undernutrition compared male patients (AOR = 1.629; 95% CI: 1.035- 2.553). Similarly patients who were food insecure had 2.685 times higher odds of undernutrition compared to food- secure patients (AOR=2.685, 95% CI: 1.668, 4.324). In addition, cancer patients with low dietary diversity had 2.218 times higher odds of undernutrition compared to those with high dietary diversity (AOR=2.218, 95% CI: 1.416, 3.474).

Patients with stage 4 cancer were 2.9 times higher odds of undernourished compared to patients with stage 1 cancer (AOR=2.908, 95%CI: 1.523, 5.554). In addition, patients with poor performance status had 1.95 times higher odds of undernutrition compared to those with good performance status (AOR=1.951, 95% CI: 1.225, 3.107) (Table 7).

Table 7: Multivariable logistic regression of factors associated with undernutrition of adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Ethiopia (n=399)

Variables				AOR (95% CI)	P-value
		Undernourished	Normal		
Age (in years)	18-34	35(45.5)	42(54.5)	1	
	35-54	100(53.2)	88(46.8)	1.694(0.946, 3.035)	0.076
	≥55	90(67.2)	44(32.8)	2.633 (1.405, 4.935)	0.003*
Sex	Female	147(59.8)	99(40.2)	1.629(1.035, 2.553)	0.034*
	Male	78(51.0)	75(49.0)	1	
Educational status	Illiterate	123(60.0)	82(40.0)	1.026(0.649, 1.624)	0.911
	Literate	102(52.6)	92(47.4)	1	
Food security	Insecure	175(63.9)	99(36.1)	2.685(1.668, 4.324)	0.000*
	Secure	50(40.0)	75(60.0)	1	
Dietary diversity	Low	150(64.1)	84(35.9)	2.218(1.416, 3.474)	0.000*
	High	75(45.5)	90(54.5)	1	
Alcohol	Yes	46(63.0)	27(37.0)	1.443(0.794-2.623)	0.229
	No	179(54.9)	147(43.1)	1	
Family history of cancer	Yes	28(65.1)	15(34.9)	1.645(0.773, 3.501)	0.197
	No	197(55.3)	159(44.7)	1	
Comorbidity	Yes	42(68.9)	19(31.1)	1.785 (0.934, 3.413)	0.079
	No	183(54.1)	155(45.9)	1	
Stage of cancer	1 st stage	31(39.2)	48(60.8)	1	
	2 nd stage	47(53.4)	41(46.6)	1.782(0.910, 3.486)	0.092
	3 rd stage	62(56.4)	48(43.6)	1.903(0.998, 3.628)	0.051
	4 th stage	85(69.7)	37(30.3)	2.908(1.523, 5.554)	0.001*
Meal frequency	<3	185(58.5)	131(41.5)	1.350(0.782, 2.331)	0.282
	≥3	40(48.2)	43(51.8)	1	
Performance status	Poor	165(63.7)	94(36.3)	1.951(1.225, 3.107)	0.005*
	Good	60(42.9)	80(57.1)	1	

Notes: COR=Crude Odds Ratio AOR= Adjusted Odd Ratio 1= Reference categories

5. DISCUSSION

This study investigated the prevalence and associated factors of undernutrition among adult cancer patients attending treatment at Hiwot Fana Hospital in Eastern Ethiopia. Accordingly, more than half (56.4%) 95% CI: (51.5% to 61.3%) of the participants were undernourished. Older age, female gender, household food insecurity, stage of cancers and poor performance status were significantly associated with undernutrition of cancer patients.

This study showed that more than half (56.4%) of adult cancer patients had undernutrition. This finding is consistent with studies conducted in Addis Ababa (58.2%) (Gebremedhin et al., 2021), Greece (54.9%) (Vamvakari et al., 2023), (53.8%) in Belgium (Rasschaert et al., 2024) and (60%) in Nigeria (Ntekim et al., 2017) . In Jimma (61.3%) (Enkobahry et al., 2023). However, findings in this study exceed those reported in other regions. For instance, studies from Hawassa (48.1%) (Muhammed et al., 2022), possibly due to sample size and variation in nutritional assessments tools. Additionally, higher than studies conducted in Thailand (26.7%) (Sanguanwongthong and Suprasert, 2022), Germany (45.9%) (Sonneborn-Papakostopoulos et al., 2021), Poland (44.19%) (Polański et al., 2021), Nepal (23.15%) (Anuj et al., 2022), Kenya (31%) (Kaduka et al., 2017) and Palestine (25%) (Badrasawi et al., 2021) were undernourished. The observed discrepancy might be due the heterogeneity nature of the study participants, different in socio-economic status, geographical variation and difference in assessment tools (Katabalo et al., 2025, Zheng et al., 2025).

Besides, the finding of this study was lower than a study done in Tukur Ambesa Hospital, Ethiopia (63.1%) (Worku et al., 2021), (63%) in Ghana (CI et al., 2023), Brazil (77%) (Ferigollo et al., 2018), and in Portugal (89%) (TrabuloC and P, 2022). This variation may be due to cancer type, stage at diagnosis and difference in assessment tools of nutritional screening also likely contribute to the disparity (Zheng et al., 2025).

In this study, odds of undernutrition was two folds higher among cancer patient aged ≥ 55 years compared to those aged between 18-34 years old. This finding was supported by the findings of the study conducted in Bangladesh and Iran indicated that older aged associated with undernutrition (Mohsin et al., 2024), (Karami et al., 2021). Older cancer patients are at high risk of undernutrition possibly due to physiological changes, reduced access to nutritious food, and the presence of other health conditions with aging (Dent et al., 2023). Possible explanation may be Age-related changes in body composition, particularly the reduction in lean body mass, may contribute to diminished muscle strength and overall functional capacity in older adults.

The study revealed that Female cancer patients had approximately two times higher odds of undernutrition compared to male. This is also reported on the study conducted in Bangladesh female patients had 7.74 times higher risk of undernutrition compared to males (Mohsin et al., 2024). This may be women often face unique nutritional challenges during cancer treatment, including hormonal fluctuations, lower baseline muscle mass, than men and caregiving responsibilities that may deprioritize their own dietary needs.

The likelihood of undernutrition was twofold higher among adult cancer patients who had household food insecurity compared to their counterparts. Other study conducted in Tehran, also showed that food insecurity was associated with undernutrition among cancer patients (Motlagh, 2013), and study conducted in Hawassa Ethiopia, were cancer patients those with food insecure households less likely to be well nourished (Muhammed et al., 2022). This can be explained by the fact that households experiencing food insecurity may alter their eating habits and lack sufficient food, which may result in a low nutritional status.

The study found that low dietary diversity was significantly associated with undernutrition among cancer patients. Individuals with low dietary diversity were more likely to be undernourished compared to those with higher dietary diversity score. This finding was in agreement with previous studies conducted in Iraq and Ethiopia, which similarly reported that cancer patients with low dietary diversity were more prone to undernutrition (Fattahi et al., 2020), (Girma and Nana, 2023), (Worku and Wondimagegne, 2025). The observed association may be attributed to the fact that a limited variety of food intake restricts the adequacy of essential nutrients, there by predisposing

individuals with less diverse diets to nutrient deficiencies associated with an increased risk of undernutrition.

The study indicates that stage of cancer was significantly associated with undernutrition. Participants with stage four cancer had approximately three times likelihood of being undernourished compared to early one cancer. This also reported on the study conducted in Ethiopia stage of cancer associated with undernutrition (Gebremedhin et al., 2021) , (Worku et al., 2021) , (Seid et al., 2025) and in korea (Wie et al., 2010). This may be due to the advanced stage increased metabolic demands of tumor cells that exceed dietary intake leading to undernutrition.

Poor performance status was also found to be a significant factor associated with undernutrition among cancer patients. The finding is supported by previous studies, poor performance status associated with undernutrition (Muhammed et al., 2022, Worku et al., 2021). Similarly, studies conducted in Bangladesh reported that limited functional capacity significantly increase the risk of undernutrition among cancer patients (Mohsin et al., 2024) and in Brazil(Silva et al., 2015). Poor functional status can limit a patient's ability to prepare, chew, and consume food adequately, which directly reduce dietary intake. These finding highlight that maintaining functional ability is crucial for ensuring adequate nutrition, as impaired performance can exacerbate nutritional deficits in cancer patients.

Over half of adult cancer patients are undernourished, influenced by modifiable factors dietary diversity, food security, performance status, and non-modifiable factors age, sex, and stage of cancer. Modifiable factors actionable targets for intervention routine nutritional screening for all cancer patients. Promoting diverse diets, improving food security can help to reduce undernutrition among cancer patients, improve treatment outcome.

6. STRENGTH AND LIMITATION OF THE STUDY

6.1. Strength of the study

The strengths of this study identifying undernutrition and associated factors of cancer patient in the study area and used PG-SGA tools validated in Ethiopian context.

6.2. Limitation of the study

This study has some limitation. Firstly, its cross-sectional design limits the ability to establish cause and effects relationships. Secondly, as the study conducted in a single hospital finding may not generalizable to all cancer patients in Ethiopia. Additionally some variables, such as dietary diversity and food insecurity relied on self-reported information, which may subject to recall bias. To minimize this limitation detailed training was provided to data collectors to ensure accurate reporting. Efforts were made to reduce social desirability bias by conducting interviews in a neutral and supportive environment.

7. CONCLUSION AND RECOMMENDATIONS

7.1. Conclusion

This study found that more than half of adult cancer patients were undernourished. Being older age, female, household food insecurity, low-dietary diversity, stage four cancers and poor performance status were significantly associated with undernutrition of adult cancer patients. The findings provide crucial insights for informing targeted nutritional intervention and comprehensive care strategies to mitigate undernutrition. Strategies such as improving dietary diversity, support patients with functional limitation and improving food security are essential to reduce undernutrition and improve treatment outcome for cancer patients.

7.2. Recommendations

For hospitals and health workers:

- ✓ Strength Implementation of nutritional screening regularly for all cancer patients especially older age, female and advanced stage of cancer patient.
- ✓ Early detection/screening of cancer.
- ✓ Provide individualized dietary counselling to improve dietary diversity.
- ✓ Implement programs to improve food security for cancer patients, such as providing food assistance.

Nongovernmental organizations:

- ✓ Nongovernmental organizations should provide support to cancer patients that have an economic problem to improve food security so that they could not expose to stress and nutritional problems.
- ✓ Prioritize funding and resource mobilization to support nutritional programs, including training of healthcare workers and procurement of nutritional supplements.

For Researchers:

- ✓ Biomarkers and Longitudinal studies are needed to explore the state of undernutrition of cancer patients.

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9. ANNEXES

9.1 Information sheet and informed voluntary consent form for head of hospital (English version)

Introduction: My name is Beyan Abdela I am the Principal Investigator of the study to be conducted in this Hiwot Fana hospital. I am studying for my Master's degree at Haramaya University, the College of Health and Medical Sciences. I kindly request you to lend me your attention to explain you about the study and your institution being selected as the study setting.

Study title: Undernutrition and associated factors among adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia.

Aim of Study: The aim of this study to assess undernutrition and associated factors among adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia. The finding of this study to can be paramount importance for the hospital to plan intervention programs to prevent undernutrition and improve undernutrition of cancer patient in Hiwot Fana Hospital Eastern Ethiopia and promote better treatment tolerance, and ultimately enhance patient outcomes. More ever aim of this study is to write a thesis as a requirement for the partial fulfillment of master's degree program in nutrition.

Procedure and duration: Data collection was done with interview of participants using a questionnaire to provide with pertinent data that is helpful for the study. I was interview them about 90 questions using a questionnaire and take your height and weight that was totally take about 45 minutes, so I kindly ask you to spare your time with me.

Risks and benefits: The risk of participating in this study is minimal, but only taking few minutes from participant. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for the local health planners.

Confidentiality: The information they will provide is confidential. There will no information that will identify you in particular. The finding of the study will be general to the study population and will not reflect any thing particular of individual person or housing. The questionnaire will coded

to exclude showing names and other specific identity. No reference will make in oral or written reports that could link you to the research.

Rights: Participation for this study is voluntary. The participants have the right to declare to participate or not in this study. If they decide to participate, they have the right to withdraw from the study at any time and this will not label them for any loss of benefits, which they otherwise are entitled. They do not have to answer any question that they do not want to answer. The hospital has also the right to stop this study from being conducted if any misdeeds and unethical procedures are observed during the data collection process in the Hospital's premises.

Contact address

If you have, any question inquires at any time please contact with the following addresses:

Principal investigator: Beyan Abdela Email: beyanabdela123@gmail.com Mobile phone: 0928198058. Haramaya University College of Health and Medical Sciences Institutional Research Ethical Review Committee: Office phone: 0254662011 and P.O.Box: 235, Harar.

Declaration of informed voluntary consent

I have read the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that have been unclear. I was informed that participants have the right to withdraw from the study at any time or not to answer any question that they do not want to answer. Therefore, I declare my voluntary consent on behalf of Hiwot Fana Specialized Hospital management to allow this study to be conducted in hospital with my initials (signature) as indicated below.

Name & Signature of the head of hospital Date

Name & Signature of principal investigator..... Date.....

Thank you for your cooperation!

9.2 Participant Information Sheet & Informed voluntary Consent Form for Study Participants (English Version).

Introduction: Hello my name isI am working as data collector for the study conducted by Beyan Abdela who is studying for his master's degree at Haramaya University, College of Health and Medical Sciences. I kindly request you to lend me your attention to explain you about the study and being participant.

Study title: Undernutrition and associated factors among adult cancer patients attending treatment at Hiwot Fana Comprehensive Specialized Hospital, Eastern Ethiopia.

Aim of Study: The aim of this study to assess undernutrition and associated factors among adult cancer patients attending treatment at Hiwot Fana Hospital Eastern Ethiopia. The finding of this study to can be paramount importance to plan intervention programs to prevent undernutrition and improve undernutrition of cancer patient in Hiwot Fana Hospital Eastern Ethiopia and promote better treatment tolerance, and ultimately enhance patient outcomes. More ever aim of this study is to write a thesis as a requirement for the partial fulfillment of master's degree program in nutrition.

Procedure and duration: I will be interviewing you using a questionnaire to provide me a relevant data that is helpful for the study. I will interview you about 90 questions using a questionnaire and take your height and weight that will totally take about 35 minutes, so I kindly ask you to spare your time with me.

Risks and benefits: A limited minimal harm may face you when participating in this study and will take about 35 minutes of your working time. There will not be any direct payment for participating in this study. Moreover, the finding from this research may reveal important information for the local health planners and implementers.

Confidentiality: The information you will provide is confidential. There will no information that will identify you in particular. The finding of the study will general to the study population and will not reflect any thing particular of individual person or housing. The questionnaire will coded to exclude showing names and other specific identity. No reference will make in oral or written reports that could link you to the research.

Rights: Participation For this study is voluntary. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits, which you otherwise entitled. You do not answer any question that you do not want to answer.

Contact Address

If you have, any question inquires at any time please contact with the following address:

Principal investigator: Beyan Abdela

Email: beyanabdela123@gmail.com

Mobile phone: 0928198058

Haramaya University College of Health and Medical Sciences Institutional Research Ethical

Review Committee: Office phone: 0254662011

P.O Box: 235, Harar.

Declaration of informed voluntary consent

I have read (was read to me) the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that have been unclear. I was informed that I have the right to withdraw from the study at any time or not to answer any question that I do not want. Therefore, I declare my voluntary consent to participate in this study with my initials (signature) as indicated below.

Name & Signature of the participant Date.....

Name & Signature of data collector..... Date.....

Thank you for your cooperation!

9.3 Participant Information Sheet & Informed voluntary Consent Form for Study Participants (Afan Oromo version).

Seensa: Akkam jirtu maqaan Koo..... Waa'ee qorannichaa fi hirmaataa ta'uu akkan isiniif ibsuuf xiyyeeffannoo keessan akka naaf liqeessitan kabajaan isin gaafadha.

Mata duree qo'annoo: Haala Dhukkubsattoota Kaansarii Ga'eessota Hospitaala Ispeeshaalaayizd Hiwot Fana Comprehensive, Ethiopia Bahaa Keessatti Argaman Keessatti Nyaata gadi aanaa fi Qabxiilee Walqabatan , Baha Itiyoophiyaa keessatti yaalamaa jiran Kaayyoo Qo'annoo: Kana malees, kaayyoon qorannoo kanaa sagantaa digirii lammaffaa gartokkoon guutuuf akka ulaagaatti barruu qorannoo (thesis) barreessuudha.

Hojimaataa fi yeroo turtii: Daataa barbaachisaa ta'ee fi qorannichaaf gargaaru naaf kennuudhaaf gaaffilee 90 fayyadamee isin gaafadha. Waa'ee gaaffilee fayyadamuun gaaffii fi deebii siif Nan godha, dheerinaafi ulfaatina kee kan walumaa galatti gara daqiiqaa 35 fudhadhu, kanaaf yeroo kee na waliin akka qusattu gaarummaadhaan si gaafadha.

Balaa fi faayidaa: Qorannoon Kun yeroo hirmaattu miidhaa xiqqaan si mudachuu danda'u daangeffamaadha, yeroo hojii kee keessaa gara daqiiqaa 35 Kan fudhatudha. Qorannoon Kun hirmaachuuf kaffaltiin kallattiin hin jiraatu. Kana malees, argannoon qorannoo kanarraa argamu karoorsitootaa fi hojiirra oolchitoota fayyaa naannoo sanaaf odeeffannoo barbaachisaa ta'e mul'isuu danda'a.

Iccitii eeguu: Odeeffannoon isin kennitan iccitiidha. Odeeffannoon addatti si adda baasu hin jiraatu. Argannoon qorannichaa ummata qorannichaa waliigalaa ta'ee waan addaa Nama dhuunfaa ykn mana jireenyaa hin calaqqisiisu. Gaaffiin maqaa agarsiisuu fi eenyummaa addaa biroo akka hin dabalamneef koodii ni kennama. Gabaasa afaaniin ykn barreeffamaan qorannichaan si walqabsiisuu danda'u keessatti eeruun tokkollee hin kennamu.

Mirga: Hirmaannaa Qorannoon kanaaf fedhiidhaan Kan raawwatamudha. Qo'annoo kana irratti hirmaachuu fi dhiisuu kee labsuuf mirga qabda. Yoo hirmaachuuf murteessite yeroo barbaaddetti qorannicha keessaa ba'uuf mirga qabda kunis faayidaa kasaaraa kamiyyuu Kan ati karaa biraatiin mirga argatte kamiyyuu si hin mallatteessu. Gaaffii deebii kennuu hin barbaanne kamiyyuu hin deebistu.

Teesoo Quunnamtii

Yoo qabaattan gaaffiin yoo jiraate yeroo barbaaddanitti teessoo armaan gadii kanaan qunnamaa:

Qorataan ijoo: Beyan Abdela

Imeelii: beyanabdela123@gmail.com irratti ergaa

Bilbila harkaa: 0928198058

Yuunivarsiitii Haramaya Kolleejjii Saayinsii Fayyaa fi Fayyaa Qorannoo Dhaabbilee Koree

Gamaaggama Naamusaa: Bilbila waajjira: 0254662011

P.O Box: 235, Harar.

Labsii hayyama tola ooltummaa beekumsa qabu

Waraqaa odeeffannoo hirmaattotaa dubbiseera. Kaayyoo qorannichaa, hojimaata, balaa fi faayidaa, dhimmoota iccitii, mirga hirmaachuu fi teessoo quunnamtii gaaffii kamiifuu sirriitti hubadheera. Wantoota ifa hin taaneef gaaffii akkan gaafadhu carraan naaf kennameera. Yeroo barbaadetti qo'annoo keessaa ba'uuf ykn gaaffii hin barbaanne kamiyyuu deebisuuf mirga akkan qabu Nan beeksisa. Kanaafuu, qorannoo kana irratti hirmaachuuf fedhii kootiin akka armaan gaditti ibsametti qubee jalqabaa (mallattoo) kootiin Nan ibsa.

Maqaa & Mallattoo hirmaataa..... Guyyaa.....

Maqaa fi Mallattoo qorataa..... Guyyaa.....

9. 4 Participant Information Sheet & Informed voluntary Consent Form for Study Participants (Amharic Version).

መግቢያ:- ሃይ ስሜ በሀረማያ ዩኒቨርሲቲ የጤና እና ህክምና ሳይንስ ኮሌጅ ሁለተኛ ዲግሪያቸውን በመከታተል ላይ ባለው በያንድ አብደላ ለሚካሄደው ጥናት መረጃ ሰብሳቢ ሆኜ እየሰራሁ ስለ ጥናቱ እና ስለ ተሳታፊነትዎ ለማስረዳት ትኩረትዎን እንዲሰጡኝ በአክብሮት እጠይቃለሁ።

የጥናት ርዕስ:- በምስራቅ ኢትዮጵያ ህይወት ፋና ኮምፕሌክስ ስፔሻላይዝድ ሆስፒታል ህክምና እየተደረገላቸው ያሉ የካንሰር ህመማን የምግብ እጥረት እና ተያያዥ ምክንያቶች

የጥናት ዓላማ:- የዚህ ሰራዊት አላማ በምስራቅ ኢትዮጵያ ህይወት ፋና ሆስፒታል ውስጥ በካንሰር ታማሚዎች ላይ የተመጣጠነ ምግብ እጥረት እና ተያያዥ ምክንያቶችን ለመገምገም. የዚህ ጥናት ግኝት በምስራቅ ኢትዮጵያ ህይወት ፋና ሆስፒታል ውስጥ የተመጣጠነ ምግብ እጥረትን ለመከላከል እና የተመጣጠነ ምግብ እጥረትን ለማሻሻል እና የተሻለ የህክምና መቻቻልን ለማጎልበት እና የታካሚውን ውጤት ለማሻሻል ጣልቃ-ገብ ፕሮግራሞችን ለማቀድ ትልቅ ጠቀሜታ አለው ።. የዚህ ጥናት የበለጠ ዓላማ በአመጋገብ ውስጥ የማስተርስ ዲግሪ መርሃ ግብር በከፊል ለማሟላት እንደ መስፈርት ሆኖ ተሰስ መጻፍ ነው።

ሂደት እና ቆይታ:- ለጥናቱ የሚረዳ ጠቃሚ መረጃ ለእኔ ለመስጠት መጠይቁን ተጠቅሜ ቃለ መጠይቅ አደርግልዎታለሁ።. መጠይቁን በመጠቀም ወደ 90 የሚጠጉ ጥያቄዎችን ቃለ መጠይቅ እስጥዎታለሁ እና ቁመትዎን እና ክብደትዎን ሙሉ በሙሉ ወደ 40 ደቂቃ ይወስዳል ስለዚህ ከእኔ ጋር ጊዜዎን እንዲያሳልፉ በትህትና እጠይቃለሁ።

አደጋዎች እና ጥቅሞች:- በዚህ ጥናት ውስጥ በሚሳተፉበት ጊዜ የተገደበ አነስተኛ ጉዳት ሊያጋጥመው ይችላል እና ከስራ ጊዜዎ 35 ደቂቃ ያህል ይወስዳል። በዚህ ጥናት ውስጥ ለመሳተፍ ምንም አይነት ቀጥተኛ ክፍያ አይኖርም. ከዚህም በላይ የዚህ ጥናት ግኝት ለአካባቢው የጤና እቅድ አውጪዎች እና ፈጻሚዎች ጠቃሚ መረጃን ሊያሳይ ይችላል።.

ሚስጥራዊነት:- የምታቀርበው መረጃ ሚስጥራዊ ነው። በተለይ እርስዎን የሚለይ መረጃ አይኖርም. የጥናቱ ግኝት ለጥናቱ ህዝብ አጠቃላይ ይሆናል እናም የግለሰብን ወይም የመኖሪያ ቤትን ምንም የሚያንፀባርቅ አይሆንም. መጠይቁያው ስሞችን እና ሌሎች ልዩ መለያዎችን ከማሳየት ይገለጻሉ. እርስዎን ከጥናቱ ጋር ሊያገናኙዎት በሚችሉ የቃል ወይም የጽሁፍ ዘገባዎች ምንም አይነት ማጣቀሻ አይሰጥም።

መብቶች:- ለዚህ ጥናት ተሳትፎ በፈቃድኝነት ነው. በዚህ ጥናት ለመሳተፍ ሆነ ላለመሳተፍ የማወጅ መብት አልዎት. ለመሳተፍ ከወሰኑ በማንኛውም ጊዜ ከጥናቱ የመውጣት መብት አልዎት እና ይህ እርስዎ ያለዎትን ማንኛውንም የጥቅማጥቅሞች ኪሳራ አይገልጽልዎትም. መመለስ የማትፈልገውን ማንኛውንም ጥያቄ አትመልስም።.

የእውቂያ አድራሻ

ካላችሁ፣ ማንኛውም ጥያቄ በማንኛውም ጊዜ የሚጠይቅ እባክዎ በሚከተለው አድራሻ ያነጋግሩ።

ዋና መርማሪ፡ በያን አብደላ

Email: beyanabdelal123@gmail.com

ሞባይል፡ 0928198058

የሀረማያ ዩኒቨርሲቲ ጤና እና ህክምና ሳይንስ ኮሌጅ ተቋማዊ ጥናትና ምርምር ስነ ምግባር ገምግሟል፡ የቢሮ ስልክ፡
0254662011

P.O Box: 235, Harar.

በመረጃ ላይ የተመሰረተ የፈቃደኝነት ስምምነት መግለጫ

የተሳታፊውን የመረጃ ወረቀት አንብቤያለሁ (ተነበበኝ)። የጥናቱን አላማ፣ አካሄዶችን፣ ስጋቶችን እና ጥቅሞችን፣ ሚስጥራዊ ጉዳዮችን፣ የመሳተፍ መብቶችን እና ለማንኛውም መጠይቆች አድራሻውን በግልፅ ተረድቻለሁ። ግልጽ ባልሆኑ ጉዳዮች ላይ ጥያቄዎችን እንድጠይቅ እድል ተሰጥቶኛል። በማንኛውም ጊዜ ከጥናቱ የመውጣት ወይም የማልፈልገውን ማንኛውንም ጥያቄ ያለመመለስ መብት እንዳለኝ ተነገረኝ። ስለዚህ፣ ከዚህ በታች በተገለፀው መሰረት በዚህ ጥናት የመጀመሪያ ሆኜ (ፊርማ) ለመሳተፍ የፈቃዴ ፍቃድ አውጃለሁ።

የተሳታፊው ስም እና ፊርማ ቀን

የውሂብ ሰብሳቢው ስም እና ፊርማ ቀን.....

ስለ ትብብርዎ እናመሰግናለን!

9.5 Questionnaires (English version)

Name of the hospital: Hiwot Fana Comprehensive Specialized Hospital

Section A: Socio-demographic characteristics

No	Variables	Response	skip
101	Age	_____ Years.	
102	Sex	1. Male 2. Female	
103	What is your educational status?	1.No formal education 2.Primary education (1-8) 3.Secondary education (9-12) 4.Higher education(Diploma and above)	
104	What is your employment status?	1.Government employee 2.Self-employed 3.Student 4.Farmer 5.Merchant 6.House wife 7.Others	
105	What is your marital status?	1.Married 2.Single 3.Widowed 4.Divorced	
106	Where is your permanent residence?	1.Urban 2. Rural	
107	How many family members Do you have?	1. <5 2. ≥ 5	

Section B: Wealth Index Housing condition and assets -please answer the following questions thinking about the housing condition of your household

Circle “1” if your parents have the following assets and circle “0” if not.

	Asset type	Response		S. N	Asset type	Response			
201	Electricity	0. NO	1. Yes	214	Table	0. NO	1. Yes		
202	Television	0. NO	1. Yes	215	Chair	0. NO	1. Yes		
203	Radio	0. NO	1. Yes	216	Sofa	0. NO	1. Yes		
204	Fixed telephone	0. NO	1. Yes	217	Bed (with cotton/sponge/spring mattress)	0. NO	1. Yes		
205	Mobile phone	0. NO	1. Yes	218	Own living house	0. NO	1. Yes		
206	Computer	0. NO	1. Yes	219	Electric mitad	0. NO	1. Yes		
207	Refrigerator	0. NO	1. Yes	220	Domestic animal	0. NO	1. Yes		
208	Watch/clock	0. NO	1. Yes	221	Agricultural land	0. NO	1. Yes		
Housing characteristics									
209	Car	0. NO	1. Yes	222	Type of floor	1. Mud	2. Cement	3. Ceramic	4. Other__
210	Bajaj	0. NO	1. Yes	223	Type of roof	1. Grass	2. Corrugated iron	3. Tiles	4. Other__
211	Motor cycle	0. NO	1. Yes	224	Type of wall	1. Wood and mud	2. Cement and blocks	3. Bricks	4. Other__
212	Bicycle	0. NO	1. Yes	225	Kind of toilet facility	1. No facility/ bush/field	2. Flush toilet	3. Traditional pit toilet	4. Ventilated improved pit (VIP) Latrine

213	Cart	0. NO	1. Yes	226	main source of drinking water	1. Piped water	2. Protected Spring	3. Unprotected spring	4. Spring or River
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Section B: clinical related factors			
301	Family history of cancer		0. No 1. Yes
302	co morbidity (chronic disease condition other than cancer)		0. No 1. Yes
303	Types of cancer		1. Breast cancer 2. cervical cancer 3. ovarian cancer 4. gastric cancer 5. lung cancer 6. liver cancer 7. Esophagel cancer 8. colorectal cancer 9. others
304	Stages of cancer		1. stage one 2. stage two 3. stage three 4. stage four
	Duration of illness (in years)		1. >2 2. ≤2
305	Type of treatment		1. Chemotherapy 2. Radiation 3. Chemo+Radiation 4. Surgery+Chemo 5. Radiation+surgery+chemo
306	Height		_____cm
307	Weight		_____kg

Section C Dietary assessment questions			
402	How is your meal Frequency for 24 hrs?	_____ per day	

Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access Question			
NO	Question	Response Option	Code
501	In the past four weeks, did you worry that your household would not have enough food?	0= No (Skip to Q2) 1= Yes	
501a	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
502	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	0 = No (skip to Q3) 1=Yes	
502a	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
503	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 (skip to Q4) 1=Yes	
503a	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
504	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 (skip to Q5) 1=Yes	
504a	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
505	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 (skip to Q6) 1=Yes	
505a	How often did this happen?	1 = Rarely	

		2 = Sometimes 3 = Often	
506	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 (skip to Q7) 1=Yes	
506a	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
507	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 (skip to Q8) 1=Yes	
507a	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
508	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 (skip to Q9) 1=Yes	
508a	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
509	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 1=Yes	
509a	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
	Individual dietary diversity		No- 0 Yes-1
Did you consume food from any of these food groups in the past 24 hours?			

601	STRACHY STAPLES (combination of cereals & white root tubers)	Corn/maize, rice, wheat, sorghum, millet, or any other grains or foods made from these(e.g. bread, noodles, porridge, or other grain products)	
602	DARK GREEN LEAFY, VEGETABLE	Dark green/leafy vegetables, including wild ones, spinach, kale, cassava leaves	
603	OTHER VITAMIN A RICH FRUIT AND VEGETABLES	Ripe mangoes, ripe papaya, pumpkin, carrot, squash, or sweet potatoes that are orange inside, red sweet pepper	
604	OTHER VEGETABLES AND FRUITS	tomato, onion, eggplant	
605	ORGAN MEAT	liver, kidney, heart or other organ meats or blood-based foods	
606	MEATS AND FISH	beef, pork, lamb, goat, rabbit, wild game, chicken, duck, or other birds and fresh or dried fish or shellfish	
607	EGGS	chicken, duck, guinea fowl or any other egg	
608	LEGUMES, NUTS AND SEEDS	beans, peas, lentils, nuts, seeds or foods made from these	
609	MILK AND MILK PRODUCTS	milk, cheese, yogurt or other milk products	

Section D: Behavioral characteristic			
701	Use of alcohol	0.No 1. yes	
702	Smoking cigarettes	0.No 1. yes	
703	chewing kchat	0.No 1. yes	

Hospital Anxiety and Depression Scale (HADS)					
Tick the box beside the reply that is closest to how you have been feeling in the past Week					
D	A		D	A	
801		I feel tense or 'wound up':	808		I feel as if I am slowed down:
	3	Most of the time	3		Nearly all the time
	2	A lot of the time	2		Very often
	1	From time to time, occasionally	1		Sometimes
	0	Not at all	0		Not at all
802		I still enjoy the things I used to enjoy:	809		I get a sort of frightened feeling like 'butterflies' in the stomach:
0		Definitely as much		0	Not at all
1		Not quite so much		1	Occasionally
2		Only a little		2	Quite Often
3		Hardly at all		3	Very Often
803		I get a sort of frightened feeling as if something awful is about to happen:	810		I have lost interest in my appearance:
	3	Very definitely and quite badly	3		Definitely
	2	Yes, but not too badly	2		I don't take as much care as I should
	1	A little, but it doesn't worry me	1		I may not take quite as much care
	0	Not at all	0		I take just as much care as ever
804		I can laugh and see the funny side of things:	811		I feel restless as I have to be on the move
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
805		Worrying thoughts go through my mind:	812		I look forward with enjoyment to things:
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to
	0	Only occasionally	3		Hardly at all
806		I feel cheerful:	813		I get sudden feelings of panic:
3		Not at all		3	Very often indeed

2		Not often		2	Quite often
1		Sometimes		1	Not very often
0		Most of the time		0	Not at all
807		I can sit at ease and feel relaxed:	814		I can enjoy a good book or radio or TV program:
	0	Definitely		0	Often
	1	Usually		1	Sometimes
	2	Not Often		2	Not often
	3	Not at all		3	Very seldom

ECG/WHO performance status			
901	Fully active	0	
902	Ambulatory and unable to carry out work of light	1	
903	Ambulatory and unable to carry out any activates	2	
904	More than 50% of working hour confined to bed or chair	3	
605	Totally confined to bed or chair	4	

Section I: Patient-generated subjective global assessment (PG-SGA) adapted to Ethiopian context

Box-1: Weight (maximum 5 points)

I currently weigh about ____ Kg

Previous weight, I weighed about ____Kg. I don't know

During the past two weeks, my weight has

- ☐ Decreased (1) ☐ Not changed (0) ☐ Increased (0)

Box-2: Food Intake (maximum 4 points)

As compared to my usual intake, I would rate my food intake during the past month as

- ☐ Unchanged (0) ☐ More than usual (0) ☐ Less than usual (1)

I am now taking

- ☐ Usual food, but less than the normal amount (1)
- ☐ Little solid food (2)
- ☐ Only liquids (E.g., Milk, juices, gruel) (3)
- ☐ Only nutritional supplements (E.g., vitamins, minerals, Ensure, Bombe) (3)
- ☐ Very little of anything (4)
- ☐ Only tube feeding or nutrition by vein (IV fluids are not included) (0)

Box-3: Symptoms (the maximum point is 24) (additive)

**Which of the following problems have limited you from eating enough during the past 2weeks?
(check all that apply)**

- | | |
|--|---|
| ☐ No problems eating (0) | ☐ No appetite. Just did not feel like eating (3) |
| ☐ Nausea (1) | ☐ Vomiting (3) |
| ☐ Constipation (1) | ☐ Diarrhea (3) |
| ☐ Mouth sores (2) | ☐ Dry mouth (1) |
| ☐ I have no tastes (1) | ☐ Food smells bother me (1) |
| ☐ I feel full quickly (1) | ☐ Problems of swallowing (2) |
| ☐ Fatigue (1) | ☐ Any pain? if yes, ask where. (3) |
| ☐ Other (1) | |

Box 4: Activities and Function (Maximum point = 4)

Over the past month. I would generally rate my activity as

- ☐ As usual with no limitations (0)
- ☐ Not as usual, but able to be up and about with fairly normal activities (1)
- ☐ Not feeling up to most things, but in bed or chair less than half the day (2)
- ☐ Able to do little activity and spend most of the day in bed or chair (3)
- ☐ Pretty much bedridden, rarely up of bed (3)

The professional part of the PG-SGA tool

Worksheet 1 - Scoring weight loss (use 6-month data only if there is no 1-monthweight data)

Weight loss in 1 month	Score/Point	Weight loss in 6 months
10% or greater	4	20% or greater
5-9.9%	3	10-19.9%
3-4.9%	2	6-9.9%
2-2.9%	1	2-5.9%
0-1.9%	0	0-1.9%

Worksheet 2 - Disease and its relation to nutritional requirements (give 1 point for eachdisease)

- | | |
|---|---|
| ☐ Cancer (include the stage) (1) | ☐ AIDS (1) |
| ☐ COPD, TB, or Heart Failure (1) | ☐ Chronic Kidney Disease (CKD) (1) |
| ☐ Pressure ulcer, open wound, or fistula (1) | ☐ Presence of trauma (major surgeries)(1)A |
| ☐ Age greater than 65 years (1) | ☐ Other chronic diseases (specify) |

Worksheet 3 - Metabolic Demand (the score is additive and the maximum point is 9)

Stress	None (0)	Low (1)	Moderate (2)	High(3)
Fever (0-3)	no fever	>37.2 and < 38.3	≥38.3 and <38.8	≥38.8
Fever duration (0-3)	no fever	< 72 hours	72 hour	>72hour
Corticosteroids (0-3)	no steroid	< 10mg Predin/day	≥10 and < 30mg/day	≥30mg/day

Worksheet 4 - Physical Exam: Not additive, the maximum point is “3”

Muscle status

Temporal muscle	0	1	2	3
Clavicles (pectoralis)	0	1	2	3
Shoulders (deltoids)	0	1	2	3
Interosseous muscles	0	1	2	3
Scapula (trapezius)	0	1	2	3
Thigh (quadriceps)	0	1	2	3
Palmar muscles	0	1	2	3
Calf muscles	0	1	2	3

Global muscle status rating 0 1 2 3

Fat Stores

Orbital fat pads	0	1	2	3
Triceps skinfold	0	1	2	3
Fat overlying lower ribs	0	1	2	3

Global fat deficit rating 0 1 2 3

Fluid status

Ankle edema	0	1	2	3
Sacral edema	0	1	2	3
Ascites	0	1	2	3

Global fluid status rating 0 1 2 3

Total body deficit rating (0-3)

No deficit (0)

Mild deficit (1)

Moderate deficit (2)

Severe deficit (3)

Total PG SGA

9.6 Questionnaire (Afaan oromoo version)

Kutaa 1ffaa: Qabxiilee hawaas – dimogiraafii			
Lakk	Gaafilee	Koodii	
101	Umurii waggaadhaan	_____ Waggaadhaan	
102	Saala	1.dhiira 2. dhalaa	
103	Haalli barnootaa keessanii maali?	1. Barnoota idilee kan hin qabne 2. Barnoota sadarkaa tokkoffaa (1-8) 3. Barnoota sadarkaa lammaffaa (9-12) 4. Barnoota olaanoo (Diploma fi isaa ol)	
104	Haalli hojii keessan maali?	1. Hojjetaa mootummaa 2. Ofiin of hojjechiisu 3. Barataa 4. Qotee bulaa 5.Daldalaa 6. Haadha manaa 7. kan biroo	
105	Haalli gaa'ela keessanii maali?	1. Kan fuudhe 2. Qeenxee 3. Dubartii abbaan manaa irraa du'e 4. Hiikkaan 5. Addaan bahuu	
106	Bakki jireenyaa dhaabbataa keessani eessa ?	1.Magaalaa 2.Baadiyyaa	
107	Miseensota maatii meeqa Ni qabdaa?	1. <5 2. ≥5	

Kutaa 2ffaa: Indeksii Qabeenya Haala mana jireenyaa-maaloo haala mana jireenyaa mana keessanii yaaduudhaan gaaffilee armaan gadii deebisaa

Warri kee qabeenya armaan gadii yoo qabaatan “1” irratti geengoo godhi yoo hin qabaanne immoo “0” irratti geengoo godhi.

Lakk	Gosa qabeenya	Deebii		Lak	Gosa qabeenya	Deebii			
201	Humna ibsaa	0. Lakkii	1. Yes	214	Minjaala	0. Lakkii	1. Eeyyee		
202	Televijiinii	0. Lakkii	1. Yes	215	Barcuma	0. Lakkii	1. Eeyyee		
203	Raadiyoo	0. Lakkii	1. Yes	216	Sofa	0. Lakkii	1. Eeyyee		
204	Bilbila dhaabbataa	0. Lakkii	1. Yes	217	Siree (furaana suufii/ispoonjii/birraa qabu	0. Lakkii	1. Eeyyee		
205	Mobaayila	0. Lakkii	1. Yes	218	Mana jireenyaa ofii	0. Lakkii	1. Eeyyee		
206	Koompiitara	0. Lakkii	1. Yes	219	Mitaad elektirikii	0. Lakkii	1. Eeyyee		
207	Kottolleessaa	0. Lakkii	1. Yes	220	Beeylada manaa	0. Lakkii	1. Eeyyee		
208	Sa'aatii/sa'aatii	0. Lakkii	1. Yes	221	lafa qonnaa	0. Lakkii	1. Eeyyee		
Amaloota mana jireenyaa									
209	Konkolaataa	0. Lakkii	1. Yes	222	Gosa lafaa	1. Mude	2. Simintoo	3. Ser aamii	4. ka n bira a__ –
210	Bajaaj	0. Lakkii	1. Yes	223	Gosa foddaa	1. Marga	2. Sibiilli korregeetii	3. Tiilee	4. ka n bira a__

211	Saayikilii mootoraa	0. Lakkii	1. Yes	224	Gosa dallaa	1. Mukaa fi dhoqqee	2. Siminto o fi bilookii	3. Sib iila	4. ka n bira a__ –
212	Biskileettii	0. Lakkii	1. Yes	225	Gosa mana fincaanii	1. Faayida an/bosona/dirree hin qabu	2. Mana fincaanii dhiqachu u	3. Ma na fincaanii boolla aadaa	4. M ana fincaanii boolla fooya'a a (VIP) qille ensa qabu
213	Gaarii	0. Lakkii	1. Yes	226	madda bishaan dhugaatii isa guddaa	1. Bishaan tuuboo	2. Birraa eegumsa argate	3. Birraa eegumsa hin qabne	4. Birraa ykn Lag a/su lula

Kutaa:B wantootaa yaalaan walqabatan			
301	Seenaa maatii kaansarii	0 = Lakkii 1=Eeyyee	
302	Dhukkuba kaansarii malee kan biroo.	0 = Lakkii 1=Eeyyee	
303	Gosoota kaansarii	1.Kaansarii harmaa 2.Kaansarii gadameessaa 3.Kaansarii ovarii 4.Kaansarii garaachaa 5.Kaansarii sombaa 6.Kaansarii kalee 7.Kaansarii ujummoo nyaataa 8. Koloreektaalii 9, Kanneen biroo	
304	Sadarkaalee kaansarii	1.Sadarkaa tokkoffaa 2.Sadarkaa lama 3.Sadarkaa sadaffaa 4.Sadarkaa afur	
305	Turtii dhukkubaa	1. Waggaa >2 2. Waggaa ≤2	
306	Gosa wal'aansaa	1.Keemooteraapii 2.Raadiyooteraapii 3.Baqaqsanii hodhuu 4.Keemooteraapii fi Raadiyooteraapii 5.Keemooteraapii ,Raadiyooteraapii fi baqaqsanii hodhuu	
307	Hojjaa	cm	
308	Ulfaatina qaamaa	kg	

Kutaa C Gaaffiiwwan madaallii nyaataa			
401	Nyaanni keessan akkam sa'aati 24 keessatti yeroo meeqa nyaattu?	_____ guyyatti	

gaaffilee wabii nyaataa mana keessaa madaaluuf gargaaran			
Lakk.	Gaaffii	Filannoo Deebii	Kodii
501	Torban afran darban keessa, manni keessan nyaata gahaa akka hin arganne yaadda'aa turtanii?	0= Lakki (Gara G2tti darbi). 1= Eeyyee	
501a	Kun yeroo meeqa raawwatame?	1 = Yeroo muraasa 2 = Yeroo tokko tokko 3 = Yeroo baay'ee	
502	Torban afran darban keessa ati ykn miseensi maatii kamiyyuu sababa hanqina qabeenyaatiin gosoota nyaata filatte nyaachuu hin dandeenyee?	0 = Lakki (gara Q3tti darbi). 1=Eeyyee	
502a	Kun yeroo meeqa raawwatame?	1 = Yeroo muraasa 2 = Yeroo tokko tokko 3 = Yeroo baay'ee	
503	Torban afran darban keessa ati ykn miseensi maatii kamiyyuu sababa hanqina qabeenyaatiin nyaata adda addaa daangeffame nyaachuu qabdaa?	0 = Lakki (gara Q4tti darbi). 1=Eeyyee	
503a	Kun yeroo meeqa raawwatame?	1 = Yeroo muraasa 2 = Yeroo tokko tokko 3 = Yeroo baay'ee	
504	Torban afran darban keessa, ati ykn miseensi maatii kamiyyuu nyaata gosa nyaataa biroo argachuuf qabeenya dhabuu irraa kan ka'e dhuguma nyaachuu hin barbaanne tokko tokko nyaachuu qabdaa?	0 = Lakki (gara Q5tti darbi). 1=Eeyyee	
504a	Kun yeroo meeqa raawwatame?	1 = Yeroo muraasa 2 = Yeroo tokko tokko 3 = Yeroo baay'ee	
505	Torban afran darban keessa, nyaanni gahaan waan hin jirreef, ati ykn miseensi manaa kamiyyuu nyaata si barbaachisu sitti dhaga'ame caalaa xiqqaa ta'e nyaachuu qabdaa?	0 = Lakki (gara Q6tti darbi). 1=Eeyyee	
505a	Kun yeroo meeqa raawwatame?	1 = Yeroo muraasa 2 = Yeroo tokko tokko 3 = Yeroo baay'ee	
506	Torban afran darban keessa, nyaanni gahaan waan hin jirreef, ati ykn miseensi manaa kan biraa guyyaa tokkotti nyaata xiqqaa nyaachuu qabdaa?	0 = Lakki (gara Q7tti darbi). 1=Eeyyee	
506a	Kun yeroo meeqa raawwatame?	1 = Yeroo muraasa	

		2 = Yeroo tokko tokko 3 = Yeroo baay'ee	
507	Torban afran darban keessa sababa hanqina qabeenya nyaata argachuuf mana keessan keessatti nyaanni gosa kamiyyuu nyaattan dhabee beekaa?	0 = Lakki (gara Q8tti darbi). 1=Eeyyee	
507a	Kun yeroo meeqa raawwatame?	1 = Yeroo muraasa 2 = Yeroo tokko tokko 3 = Yeroo baay'ee	
508	Torban afran darban keessa ati ykn miseensi manaa kamiyyuu nyaanni gahaan waan hin jirreef beela'ee halkan raftee?	0 = Lakki (gara Q9tti darbi). 1=Eeyyee	
508a	Kun yeroo meeqa raawwatame?	1 = Yeroo muraasa 2 = Yeroo tokko tokko 3 = Yeroo baay'ee	
509	Torban afran darban keessa ati ykn miseensi manaa kamiyyuu nyaanni gahaan waan hin jirreef halkan guutuu osoo homaa hin nyaatin deemtee?	0 = Lakki 1=Eeyyee	
509a	Kun yeroo meeqa raawwatame?	1 = Yeroo muraasa 2 = Yeroo tokko tokko 3 = Yeroo baay'ee	

	Gaaffiiwwan madaallii nyaataa		Lakk- 0 Eeyye e-1
Sa'aatii 24 darban keessatti nyaata gareewwan nyaataa kana keessaa kamirraayyuu nyaattanittu			
601	Soorata istaarchii of keessaa qaban (Walmakaa midhaan & qamadii hundee adii).	Boqqolloo/boqqolloo, ruuzii, qamadii, midhaanii, midhaan, ykn midhaan ykn nyaata biroo kanneen irraa hojjetaman kamiyyuu(fkn daabboo, noodeelii, daabboo, ykn oomishaalee midhaanii biroo)	
602	Kuduraa baala magariisa dukkanaa'aa qaban	Kuduraalee magariisa dukkanaa'oo/baala qaban, kanneen bosona, ispinaashii, kalee, baala kaasaavaa dabalatee	

603	Muduraalee biroo vitaamin A baay'ee qaban	Maangoo bilchaate, paapaayaa bilchaate, paampii, kaarotaa, squash, ykn boqqolloo mi'aawaa keessaa burtukaana ta'e, burtukaana mi'aawaa diimaa	
604	Kuduraalee fi muduraalee biroo	timaatima, basaqaa, biqiltuu Timaatima, qullubbii hanqaaquu	
605	Foon kutaale qaama horii	foon kalee, tiruu, onnee ykn qaama biroo ykn nyaata dhiiga irratti hundaa'e	
606	foon qurxummii	Foon loonii, foon allaattii, hoolaa, re'ee, hanqaaquu ykn simbirroota biroo fi qurxummii haaraa ykn bilcheeffaman ykn foon qurxummi	
607	Hanqaaquu	Hanqaaquu lukkuu, daakiyyee, ykn hanqaaquu biroo kamiyyuu.	
608	Ataroota, sanyiiwwan nyaataa, fi Qamadii	Atara, baaqelaa, qamadii, sanyii ykn nyaata kanneen irraa hojjetaman	
609	Aannanii fi wantoota aannan irraa oomishaman	Aannan ykn oomishaalee aannani kan biroo.	

Kutaa D: Amala wajjiin Kan walqabatu			
701	Alkoolii dhuguu?	0 = Lakkii 1=Eeyyee	
702	Tamboo xuuxuu?	0 = Lakkii 1=Eeyyee	
703	Jimaa qama'uu qabduu?	0 = Lakkii 1=Eeyyee	

Iskeelii Yaaddoo fi Dhiphina Hospitaala (HADS).

Sanduuqa deebii cina jiru Kan Torban darbe keessa miira sitti dhaga'amaa tureetti dhihoo ta'e irratti

mallattoo kaa'i.					
D	A		D	A	
801		Dhiphinni ykn 'madaa'ee' natti dhagahama:		808	Akka waan saffisa koo hir'iseetti natti dhaga'ama:
	3	Yeroo baayyee	3		Yeroo hunda jechuun ni danda'ama
	2	Yeroo baayyee	2		Yeroo baayyee
	1	Yeroo yerootti darbee darbee	1		Yeroo tokko tokko
	0	Gonkumaa miti	0		Gonkumaa miti
802		Ammas wantoota duraan itti gammadu nan gammada:		809	Garaa keessatti miira sodaa akka 'butterflies' natti dhagahama:
0		Hamma kana ta'uun isaa hin oolu	0		Gonkumaa miti
1		Guutummaatti hangas miti	1		Yeroo tokko tokko
2		Xiqqoo qofa	2		Yeroo baay'ee
3		Tasumaa rakkisaadha	3		Yeroo Baay'ee
		Ammas wantoota duraan itti gammadu nan gammada:			
803		Akka waan wanti hamaan tokko ta'uuf jedhutti miira sodaa akkasii natti dhagahama ta'uu:		810	Bifa kootiif fedhii dhabeera:
	3	Baayyee murtaa'aa fi baay'ee hamaa	3		Sirriimatti
	2	Eeyyee, garuu baay'ee hamaa miti	2		Hanga of eeggannoo gochuu qabu hin godhu
	1	Xiqqoo, garuu na hin yaaddessu	1		Of eeggannoo hamma kanaa gochuu dhiisuu danda'a
	0	Gonkumaa miti	0		Akkuma yeroo kamiyyuu of eeggannoo nan godha

804		Kolfee gama nama kofalchiisu arguu nan danda'a		811	Irra ta'uu waanan qabuuf boqonnaa dhabuun natti dhagahama
0		kan wantootaa:		3	socho'uu:
1		Hanga yeroo hunda danda'etti		2	Baayyee dhuguma
2		Amma baay'ee miti		1	Baay'ee baay'eedha
3		Amma hangas akka hin taane beekamaadha		0	Baay'ee miti
805		Yaadonni yaadessaa ta'an koo keessa darbu		812	Gammachuun hawwii guddaan eeggadha
	3	sammuu:	0		wantoota:
	2	Yeroo guddaa	1		Akkuma yeroo kamiyyuu godhe
	1	Yeroo baayyee	2		Kan duraan ture caalaa xiqqaadha
	0	Yeroo yerootti, garuu yeroo baay'ee miti	3		Kan duraan ture irraa xiqqaa ta'uun isaa hin oolu
806		Gammachuun natti dhagahama:		813	Miirri rifachuu akka tasaa natti dhagahama:
3		Gonkumaa miti		3	Yeroo baayyee dhuguma
2		Yeroo baayyee miti		2	Yeroo baayyee
1		Yeroo tokko tokko		1	Yeroo baayyee miti
0		Yeroo baayyee		0	Gonkumaa miti
807		Tasgabbaa'ee taa'ee boqonnaan natti dhaga'amuu n an danda'a:		814	Kitaaba ykn raadiyoo ykn TV gaarii ta'e tokkotti gammaduu nan danda'a
	0	Sirriimatti	0		sagantaa:
	1	Yeroo hedduu	1		Yeroo hedduu
	2	Yeroo baay'ee Miti	2		Yeroo tokko tokko

	3	Gonkumaa miti	3		Yeroo baayyee miti
--	---	---------------	---	--	--------------------

haala raawwii hojii ECG/WHO				
901	Guutummaatti socho'aa		0	
902	Ambulatory fi hojii ifaa raawwachuu kan hin dandeenye		1	
903	Ambulatory fi hojii kamiyyuu raawwachuu hin dandeenye		2	
904	Sa'aatii hojii %50 ol siree ykn teessoo irratti kan daangeffame		3	
905	Guutummaatti siree ykn teessoo irratti kan daangeffame		4	

Kutaa E

Madaallii addunyaa dhukkubsattootaan maddisiifame (PG-SGA) haala Itoophiyaa wajjin walsimu

Sanduuqa-1: Ulfaatina (qabxii guddaa 5).

Yeroo ammaa kana gara ____ Kg

Dheerinni koo gara ____ cm dha

Ji'a tokko dura, gara ____Kg.

Ji'a jaha dura, gara ____Kg

Torban lamaan darban keessatti ulfaatinni koo...

☐ Hir'ate (1) ☐ Hin jijjiiramne (0) ☐ Dabale (0)

Sanduuqa-2: Nyaata Fudhachuu (qabxii ol'aanaa 4)

Nyaata koo isa barama waliin wal bira qabamee yoo ilaalamu, nyaata ji'a darbe keessa fudhadhe akka

☐ Hin jijjiiramne (0) ☐ Yeroo biraa caalaa (0) ☐ Kan barama irraa gadi (1)

Amma fudhachaa jira

☐ Nyaata barama, garuu hamma idilee gadi (1)

☐ Nyaata jabaa xiqqoo (2)

☐ Dhangala'oo qofa (Fkn, Aannan, dhangala'oo, qamadii). (3)

☐ Dabalata soorataa qofa (Fkn, vitaaminii, albuuda, Ensure, Bombe).(3)

☐ Waan kamiyyuu keessaa baayyee xiqqaadha (4)

☐ Nyaata tuubii ykn soorata ujummoo dhiigaatiin qofa (dhangala'oonni IV hin dabalamne).(0)

Sanduuqa-3: Mallattoolee (qabxiin guddaan 24) (dabalata).

Rakkoolee armaan gadii keessaa torban 2n darban keessatti nyaata gahaa akka hin nyaanne isin daangeesse isa kami? (kanneen ilaallatu hunda ilaali)

- | | |
|--|---|
| ☐ Nyaachuu irratti rakkoon hin jiru (0) | ☐ Fedhii nyaata dhabuu (3) |
| ☐ ol deebisaa (1) | ☐ Haqqisaa (3) |
| ☐ Constipation (1) | ☐ garaa kaasa (3) |
| ☐ Madaa afaanii (2) | ☐ goginsa afaanii (1) |
| ☐ Dhamdhama dhabuu (1) | ☐ urgaan nyaata niin jibba (1) |
| ☐ Gara nama guutamu (1) | ☐ Rakkoo liqimsuu(2) |
| ☐ Dadhabuu (1) | ☐ Dhukkubii. (3) |
| ☐ Kan biroo(1) | |

Sanduuqa 4: Gochaalee fi Hojii (Qabxii guddaa = 4).

Ji'a darbe keessa. Akka waliigalaatti sochii koo akkas jedheen madaala

- ☐ Akkuma barama daangaa tokko malee (0)
- ☐ Akka barama osoo hin taane, sochiiwwan idilee ta'an waliin ka'anii deemuu danda'uu (1)
- ☐ Wantoota irra caalaan isaanii akka hin geenye, garuu siree ykn teessoo irratti walakkaa guyyaa gadi (2)
- ☐ Sochii xiqqoo hojjechuu danda'uu fi guyyaa harka caalu siree ykn teessoo irratti dabarsuu (3)
- ☐ Pretty much siree irra kan jiru, yeroo muraasaaf siree irraa ka'ee (3)

Kutaa ogummaa meeshaa PG-SGA

Waraqaa hojii 1 - Qabxii ulfaatina qaamaa hir'isuu (daataa ji'a 6 fayyadamuu yoo daataa ulfaatina ji'a 1 hin jirre qofa).

Ji'a 1 keessatti ulfaatina qaamaa hir'isuu	Qabxii/Qabxii	Ji'a 6 keessatti ulfaatina qaamaa hir'isuu
10% or guddaadha	4	20% or guddaadha
5-9.9%	3	10-19.9%
3-4.9%	2	6-9.9%
2-2.9%	1	2-5.9%
0-1.9%	0	0-1.9%

Waraqaa hojii 2 - Dhukkuba fi walitti dhufeenya inni barbaachisummaa soorataa wajjin qabu (tokkoon tokkoon dhukkubaaf qabxii 1 kenni).

- | | |
|---|---|
| ☐ Kaansarii (sadarkaa dabalatee). (1) | ☐ AIDS (1) |
| ☐ COPD, TB, ykn Dadhabbii Onnee (1) | ☐ Chronic Kidney Disease (CKD) (1) |
| ☐ Madaa dhiibbaa, madaa banaa, ykn fistula (1) | ☐ Presence of trauma (major surgeries)(1)A |
| ☐ Umriin waggaa 65 ol (1) | ☐ Other chronic diseases (specify) |

Waraqaa Hojii 3 - Fedhii Meetaabolii (qabxiin dabalataa yoo ta'u qabxiin guddaan 9).

Cinqii	Homa (0)	Gad bu'aa (1)	Giddu galeessa (2)	Ol aanaa (3)
Dhaqna gubaa (0-3)	Ho'aa hin qabu	>37.2 fi < 38.3	≥38.3 fi <38.8	≥38.8
Turtii ho'a qaamaa (0-3)	Ho'aa hin qabu	< 72 sa'aatiiwwan	72 sa'aatiiwwan	>72 sa'aatiiwwan
Kortikoostirooyidii (0-3)	isteeroyidii hin qabu	< 10mg Predin/day	≥10 and < 30mg/day	≥30mg/day

Waraqaa Hojii 4 - Qormaata Qaamaa: Dabalataa miti, qabxiin guddaan “3” dha.

Haala maashaa

Maashaa yeroo 0 1 2 3

Kilaavikilii (pectoralis) 0 1 2 3

Garba (deltoids) 0 1 2 3

Maashaalee lafee gidduu jiran 0 1 2 3

Iskaapulaa (trapezius) jedhamu 0 1 2 3

Qoma (quadriceps) 0 1 2 3

Maashaalee harka mirgaa 0 1 2 3

Maashaalee re’ee 0 1 2 3

Sadarkaa haala maashaa addunyaa 0 1 2 3

Manneen Cophaa

Paadiiwwan cooma orbitaalaa 0 1 2 3

Triceps gogaa dachaasuu 0 1 2 3

Comaa lafee cinaachaa gadii irra jiru 0 1 2 3

Sadarkaa hanqina coomaa addunyaa 0 1 2 3

Haala dhangala’aa

Dhibee jilba jilbaa (ankle edema). 0 1 2 3

Sacral edema jedhamuun beekama 0 1 2 3

Asiitii (Ascites) jedhamu 0 1 2 3

Sadarkaa haala dhangala’aa addunyaa 0 1 2 3

Sadarkaa hanqina qaamaa waliigalaa (0-3).

Hanqinni hin jiru (0)

Hanqina salphaa (1)

Hanqina giddu galeessaa (2)

Hanqina cimaa (3)

Wali gala PG-SGA

9.7 Amharic version questionnaire

የሆስፒታሉ ስም:- ህይወት ፋና ኮምፕራሲቭ ስፔሻላይዝድ ሆስፒታል

ክፍል A: ሶሺዮ-ስነ-ሕዝብ ባህሪያት

No	ተለዋዋጮች	ምላሽ	ዝላል
101	ዕድሜ	_____ ዓመታት።	
102	ጾታዎ	1. ወንድ 2. ሴት	
103	የትምህርት ደረጃዎ ምን ያህል ነው?	1. መደበኛ ትምህርት የለም 2. የመጀመሪያ ደረጃ ትምህርት (1-8) 3. የሁለተኛ ደረጃ ትምህርት (9-12) 4. ከፍተኛ ትምህርት (ዲፕሎማ እና ከዚያ በላይ)	
104	የስራ ሁኔታዎች ምንድን ነው?	1. የመንግስት ሰራተኛ 2. የግል ስራ ላይ የተሰማሩ 3. ተማሪ 4. ገበሬ 5. ነጋዴ 6. እመብት 7. ሌሎች	
105	የጋብቻ ሁኔታዎ እንዴት ነው?	1. ያገባ 2. ያላገባ 4. የተፋታ	
106	ቋሚ መኖሪያዎ የት ነው?	1. የከተማ 2. ገጠር	
107	ስንት የቤተሰብ አባላት አለህ?	1. <5 2. ≥5	

ክፍል ለ፡ የሀብት ማውጫ የመኖሪያ ቤት ሁኔታ እና ንብረቶች -አባዘዎ ስለቤተሰብዎ የመኖሪያ ሁኔታ በማሰብ የሚከተሉትን ጥያቄዎች ይመልሱ

ወላጆቻችሁ የሚከተሉት ንብረቶች ካላቸው "1" ከበብ ያድርጉ እና ካልሆነ "0" ከበብ ያድርጉ።

	የንብረት አይነት	ምላሽ			የንብረት አይነት	ምላሽ			
201	ኤሌክትሪክ	0. አይ	1. አዎ	214	ሠንጠረዥ	0. አይ	1. አዎ		
202	ቴሌቪዥን	0. አይ	1. አዎ	215	ወንበር	0. አይ	1. አዎ		
203	ሬዲዮ	0. አይ	1. አዎ	216	ሶፋ	0. አይ	1. አዎ		
204	ቋሚ ስልክ	0. አይ	1. አዎ	217	አልጋ (ከጥጥ / ስፖንጅ / የፀደይ ፍራሽ ጋር	0. አይ	1. አዎ		
205	የሞባይል ስልክ	0. አይ	1. አዎ	218	የራሱ የመኖሪያ ቤት	0. አይ	1. አዎ		
206	ኮምፒውተር	0. አይ	1. አዎ	219	የኤሌክትሪክ ሜትር	0. አይ	1. አዎ		
207	ማቀዝቀዣ	0. አይ	1. አዎ	220	የቤት እንስሳት	0. አይ	1. አዎ		
208	ሰዓት/ሰዓት	0. አይ	1. አዎ	221	ግብርና እና	0. አይ	1. አዎ		
				የመኖሪያ ቤት ባህሪያት					
209	መኪና	0. አይ	1. አዎ	222	የወለል ዓይነት	1. ጭቃ	2. ሲሚንት	3. ሴራሚክ	4.ሌላ_____
210	ባጃጅ	0. አይ	1. አዎ	223	የጣሪያ ዓይነት	1. ሣር	2.የቆርቆሮ ብረት	3. ሰቆች	4.ሌላ__
211	የሞተር ሳይክል	0. አይ	1. አዎ	224	የግድግዳ ዓይነት	1. እንጨት እና ጭቃ	2.ሲሚንት እና ብሎኮች	3. ጡቦች	4.ሌላ_____
212	ስይክል	0. አይ	1. አዎ	225	የመጸዳጃ ቤት ዓይነት	1. ምንም መገልገያ / ቁጥቋጥ / መስክ የለም	2. ሽንት ቤት	3.ጉድጓድ ሽንት ቤት	4.የተሻሻለ ጉድጓድ (VIP) መጸዳጃ ቤት
213	Cart	0. አይ	1. አዎ	226	ዋናው የመጠጥ ውሃ ምንጭ	1. የቧንቧ ውሃ	2.የተጠበቀ ጸደይ	3.ያልተጠበቀ spri ng	4. ስፕሪንግ ወይም ወንዝ

ክፍል B፡ ክሊኒካዊ ተዛማጅ ምክንያቶች			
301	የካንሰር የቤተሰብ ታሪክ	0. አይ 1. አዎ	
302	የጋራ በሽታ (ከካንሰር በስተቀር ሥር የሰደደ በሽታ)	0. አይ 1. አዎ	
303	የካንሰር ዓይነቶች	1. የጡት ካንሰር 2. የማህፀን በር ካንሰር 3. የማህፀን ነቀርሳ 4. የጨዳራ ነቀርሳ 5. የሳንባ ነቀርሳ 6. የጉበት ካንሰር 7. የኢሶፈገስ ካንሰር 8. ኮሎሬክታል 9. ሌሎች	
304	የካንሰር ደረጃዎች	1. ደረጃ አንድ 2. ደረጃ ሁለት 3. ደረጃ ሶስት 4. ደረጃ አራት 5. ያልታወቀ ደረጃ	
	የበሽታው ቆይታ (በአመታት ውስጥ)	1. >2 2. ≤ 2	
305	የሕክምና ዓይነት	1. ኪሞቴራፒ 2. ጨረር 3. ኬሞ + ጨረር 4. ቀዶ ጥገና + ኬሞ 5. የጨረር + ቀዶ ጥገና + ኬሞ	
306	ቁመት	ሴሜ	
307	የሰውነት ክብደት	ኪ.ግ	

ክፍል C የአመጋገብ ግምገማ ጥያቄዎች			
401	ለ 24 ሰዓታት የምግብ ድግግሞሽ እንዴት ነው?	_____ በቀን	
402	ምንም ዓይነት የአመጋገብ ምክር/ምክር ተሰጥቶህ ያውቃል?	0.አይ 1. አዎ	

የቤተሰብ የምግብ ዋስትና እጦት ተደራሽነት ልኬት (HFIAS) ለምግብ ተደራሽነት መጠይቆች			
NO	ጥያቄ	የምላሽ አማራጭ	ኮድ
501	ባለፉት አራት ሳምንታት ውስጥ፣ የእርስዎ ቤተሰብ በቂ ምግብ አይኖረውም ብለው ተጨንቀው ነበር?	0 = አይ (ወደ Q2 ዝለል) 1 = አዎ	
501አ	ይህ ምን ያህል ጊዜ ተከሰተ?	1 = አልፎ አልፎ 2 = አንዳንዴ 3 = ብዙ ጊዜ	
502	ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ማንኛውም የቤተሰብ አባል በግብአት እጦት ምክንያት የመረጡትን አይነት ምግብ መመገብ አልቻላችሁም?	0 = አይ (ወደ Q3 ዝለል) 1 = አዎ	
502a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 = አልፎ አልፎ 2 = አንዳንዴ 3 = ብዙ ጊዜ	
503	ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ማንኛውም የቤተሰብ አባል በግብአት እጦት ምክንያት የተወሰነ አይነት ምግብ መመገብ ነበረባችሁ?	0 = አይ (ወደ Q4 ይዝለሉ) 1 = አዎ	
503a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 = አልፎ አልፎ 2 = አንዳንዴ 3 = ብዙ ጊዜ	
504	ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ማንኛውም የቤተሰብ አባል ሌሎች የምግብ ዓይነቶችን ለማግኘት በግብአት እጥረት ምክንያት ለመመገብ የማይፈልጓቸውን አንዳንድ ምግቦች መብላት ነበረባችሁ?	0 = አይ (ወደ Q5 ይዝለሉ) 1 = አዎ	
504a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 = አልፎ አልፎ 2 = አንዳንዴ 3 = ብዙ ጊዜ	

505	ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ማንኛውም የቤተሰብ አባል በቂ ምግብ ስለሌለ ከምትፈልጉት ያነሰ ምግብ መብላት ነበረባችሁ?	0 = አይ (ወደ Q6 ዝለል) 1=አዎ	
505a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 = አልፎ አልፎ 2 = አንዳንዴ 3 = ብዙ ጊዜ	
506	ባለፉት አራት ሳምንታት እርስዎ ወይም ሌላ የቤተሰብ አባል በቂ ምግብ ስለሌለ በቀን ውስጥ ጥቂት ምግቦችን መመገብ ነበረብዎት?	0 = አይ (ወደ Q7 ዝለል) 1=አዎ	
506a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 = አልፎ አልፎ 2 = አንዳንዴ 3 = ብዙ ጊዜ	
507	በአለፉት አራት ሳምንታት ውስጥ ምግብ ለማግኘት በሀብት እጦት ምክንያት በቤተሰብዎ ውስጥ ምንም አይነት የሚበሉት ምግብ አልነበረም?	0 = አይ (ወደ Q8 ዝለል) 1=አዎ	
507a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 = አልፎ አልፎ 2 = አንዳንዴ 3 = ብዙ ጊዜ	
508	ባለፉት አራት ሳምንታት እርስዎ ወይም ማንኛውም የቤተሰብ አባል በቂ ምግብ ስለሌለ በረሃብ ተኝተው ነበር?	0 = አይ (ወደ Q9 ዝለል) 1=አዎ	
508a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 = አልፎ አልፎ 2 = አንዳንዴ 3 = ብዙ ጊዜ	
509	ባለፉት አራት ሳምንታት ውስጥ እርስዎ ወይም ማንኛውም የቤተሰብ አባል በቂ ምግብ ስለሌለ ምንም ሳይበሉ ቀኑን ሙሉ ሄዱ?	0 = አይ 1=አዎ	
509a	ይህ ምን ያህል ጊዜ ተከሰተ?	1 = አልፎ አልፎ 2 = አንዳንዴ 3 = ብዙ ጊዜ	

	የግለሰብ የአመጋገብ ልዩነት		ቁጥር - 0 አዎ-1
ባለፈው ሳምንት ከእነዚህ የምግብ ቡድኖች ምግብ በልተሃል?			
601	የተጣበቁ ስቴፕሎች (የእህል እህሎች እና ነጭ የስር እጢዎች ጥምር)	በቆሎ/በቆሎ፣ ሩዝ፣ ስንዴ፣ ማሽላ፣ ማሽላ፣ ወይም ማንኛውም ሌሎች እህሎች ወይም ምግቦች (ለምሳሌ ዳቦ፣ ኑድል፣ ገንፎ ወይም ሌላ የእህል ውጤቶች)	
602	ጥቁር አረንጓዴ ቅጠል፣ አትክልት	ጥቁር አረንጓዴ/ቅጠላማ አትክልቶች፣ የዱር እንስሳትን፣ ስፒናች፣ ጎመን፣ የካሳቫ ቅጠልን ጨምሮ	
603	ሌሎች ቪታሚኖች የበለጸጉ ፍራፍሬዎች እና አትክልቶች	የበሰለ ማንጎ፣ የበሰለ ፓፓያ፣ ዱባ፣ ካሮት፣ ስኳሽ ወይም ከውስጥ ብርቱካን የሆኑ ድንች፣ ቀይ ጣፋጭ በርበሬ	
604	ሌሎች አትክልቶች እና ፍራፍሬዎች	ቲማቲም፣ ሽንኩርት፣ ኤግፕላንት	
605	የኦርጋን ስጋ	ጉበት፣ ኩላሊት፣ ልብ ወይም ሌሎች የአካል ክፍሎች ስጋ ወይም ደም ላይ የተመሰረቱ ምግቦች	
606	ስጋ እና አሳ	የበሬ ሥጋ፣ የአሳማ ሥጋ፣ በግ፣ ፍየል፣ ጥንቸል፣ የዱር ጫወታ፣ ዶሮ፣ ዳክዬ፣ ወይም ሌሎች ወፎች እና ትኩስ ወይም የደረቀ ዓሳ ወይም ሼልፊሽ	
607	እንቁላል	ዶሮ፣ ዳክዬ፣ ጊኒ ወፍ ወይም ሌላ ማንኛውም እንቁላል	
608	LEGUMES፣ ለውዝ እና ዘሮች	ባቄላ፣ አተር፣ ምስር፣ ለውዝ፣ ዘር ወይም ከእነዚህ የተዘጋጁ ምግቦች	
609	ወተት እና ወተት ምርቶች	ወተት፣ አይብ፣ እርጎ ወይም ሌላ ወተት ምርቶች	

ክፍል D: የባህርይ ባህሪያት			
701	አልኮል ጠጥተው ያውቃሉ	0.አይ 1. አዎ	
702	የማጨስ ልማድ አጋጥሞህ ያውቃል	0.አይ 1. አዎ	
703	ጫት መቃም አጋጥሞህ ያውቃል	0.አይ 1. አዎ	

የሆስፒታል ጭንቀት እና የመንፈስ ጭንቀት መለኪያ (HADS)					
ባለፈው ሳምንት ውስጥ ምን እንደተሰማዎት ከመልሱ አጠገብ ባለው ሳጥን ላይ ምልክት ያድርጉ					
ዲ	ሀ		ዲ	ሀ	
801		ውጥረት ወይም 'ቁስለኛ' ይሰማኛል፡-	808		የዘገየሁ ያህል ይሰማኛል፡-
	3	አብዛኛውን ጊዜ	3		ሁልጊዜ ማለት ይቻላል
	2	ብዙ ጊዜ	2		በጣም ብዙ ጊዜ
	1	ከጊዜ ወደ ጊዜ አልፎ አልፎ	1		አንዳንዴ
	0	አይደለም	0		አይደለም
802		የምደሰትባቸው ነገሮች አሁንም እደሰታለሁ፡-	809		በሆድ ውስጥ እንደ 'ቢራቢሮዎች' አይነት የፍርሃት ስሜት ይሰማኛል፡-
0		በእርግጠኝነት	0		አይደለም
1		በጣም ብዙ አይደለም	1		አልፎ አልፎ
2		ትንሽ ብቻ	2		ብዙ ጊዜ
3		በጭራሽ	3		በጣም ብዙ ጊዜ
803		እንድ አስከፊ ነገር ሊደርስ እንዳለ ያህል የፍርሃት ስሜት ይሰማኛል። ሊከሰት፡-	810		ለመልክዬ ፍላጎት አጥቻለሁ፡-
	3	በጣም በእርግጠኝነት እና በጣም መጥፎ	3		በእርግጠኝነት
	2	አዎ ግን በጣም መጥፎ አይደለም	2		የሚገባኝን ያህል ጥንቃቄ አላደርግም።
	1	ትንሽ ፣ ግን አያስጨንቀኝም።	1		ያን ያህል ጥንቃቄ ላደርግ እችላለሁ
	0	አይደለም	0		ልክ እንደበፊቱ ጥንቃቄ አደርጋለሁ
804		እኔ መሰቀል እና የነገሮች አስቂኝ ጎን ማየት ይችላሉ፡	811		በእንቅስቃሴ ላይ መሆን ስላለብኝ እረፍት ማጣት ይሰማኛል።
0		ሁልጊዜ የምችለውን ያህል	3		በጣም በእርግጥ
1		አሁን በጣም ብዙ አይደለም	2		በጣም ብዙ
2		በእርግጠኝነት አሁን በጣም ብዙ አይደለም	1		በጣም ብዙ አይደለም

3		አይደለም		0	አይደለም
805		የሚያስጨንቁ ሐሳቦች በአእምሮዬ ውስጥ ይሄዳሉ፡-	812		ነገሮችን በደስታ እጠባብቃለሁ-
	3	በጣም ብዙ ጊዜ	0		እኔ ከመቼውም ጊዜ ያህል
	2	ብዙ ጊዜ	1		ከበፊቱ ያነሰ
	1	ከጊዜ ወደ ጊዜ, ግን ብዙ ጊዜ አይደለም	2		በእርግጠኝነት ከበፊቱ ያነሰ
	0	አልፎ አልፎ ብቻ	3		በጭራሽ
806		ደስታ ይሰማኛል፡-	813		ድንገተኛ የፍርሃት ስሜት ይሰማኛል፡-
3		አይደለም		3	በጣም ብዙ ጊዜ በእርግጥ
2		ብዙ ጊዜ አይደለም		2	ብዙ ጊዜ
1		አንዳንዴ		1	ብዙ ጊዜ አይደለም
0		አብዛኛውን ጊዜ		0	አይደለም
807		በተረጋጋ ሁኔታ ተቀምጬ መዝናናት እችላለሁ፡-	814		ጥሩ የመጽሐፍ ወይም የሬዲዮ ወይም የቲቪ ፕሮግራም መደሰት እችላለሁ፡
	0	በእርግጠኝነት		0	ብዙ ጊዜ
	1	አብዛኛውን ጊዜ		1	አንዳንዴ
	2	ብዙ ጊዜ አይደለም		2	ብዙ ጊዜ አይደለም
	3	አይደለም		3	በጣም አልፎ አልፎ

ECG/WHO የአፈጻጸም ሁኔታ			
901	ሙሉ በሙሉ ንቁ	0	
902	አምቡላሪ እና የብርሃን ስራን ማከናወን አለመቻል	1	
903	አምቡላሪ እና ምንም ማነቃቂያዎችን ማከናወን አይችልም፡፡	2	
904	ከ 50% በላይ የስራ ሰዓቱ በአልጋ ወይም በወንበር ላይ ብቻ ነው	3	
605	ሙሉ በሙሉ በአልጋ ወይም በወንበር ላይ ተወስኗል	4	

Section I: PG-SGA Short Form Amharic Version

ሳጥን-1: የሰውነት ክብደት (በፊት የተለካ ወይም በእርስዎ ግምት) (ከፍተኛ ነጥብ = 5)

አሁን ያለው የሰውነት ክብደት: በኪሎ ግራም _

ቁመቱ: _____ ሳንቲ ሜትር ይሆናል. አላውቀውም

ከወር በፊት የሰውነት ክብደት: _____ ኪ.ግ ነበር አላውቀውም

ከ6 ወር በፊት የሰውነት ክብደት: _____ ኪ.ግ ነበር አላውቀውም

ባለፉት 2 ሳምንታት፣ የሰውነት ክብደት (ከሚከተለው ይምረጡ)

ቀንሷል ☐ (1) ለውጥ የለውም (0) ☐ ጨምራል (0) ☐

ሳጥን-2: የምግብ አወሳሰድ

ባለፈው 1 ወር የምግብ አወሳሰዱ ከወትሮው

አልተለወጠም (0) ከበፊቱ የተሻለ ነው (0) ከበፊቱ ያነሰ ነው (1)

ከወትሮ ሲወዳደር፣ በአሁኑ ወቅት የምግብ አወሳሰዱ

- ☐ የተለምዶ ምግብ ነገር ግን በመጠን ያነሰ (1)
- ☐ በጣም የተወሰነ ጠጣር ምግብ (2)
- ☐ ፈሳሽ ምግብ ብቻ እወስዳለሁ (ለምሳሌ፡ ወተት፣ አጥሚት) (3)
- ☐ በህክምና የተዘጋጀ ‘ማገገሚያ ምግብ’ ብቻ እወስዳለሁ (ለምሳሌ፡ ቫይታሚን፣ ማእድናት፣ ኢንሹር፣ በምቤ) (3)
- ☐ ከሁሉም እጅግ በጣም በጥቂቱ (4)
- ☐ በአፍንጫ በሚገባ ቱቦ ወይም በደም ስር ምግብ እወስዳለሁ (ግሉኮስን አይጨምርም) (0)

ሳጥን 3: አመጋገብን የሚጎዱ የህመም ምልክቶች

ባለፉት 2 ሳምንት፣ በቂ ምግብ እንዳልወሰድ ያደረጉኝ ችግሮች/ምክንያቶች (ማሳሳቢያ፡ ከአንድ በላይ ምርጫ ሊኖር ይችላል) (ከፍተኛ ነጥብ በድምር = 24)

ምንም የአመጋገብ ችግር አላጋጠመኝም (0)	የምግብ ፍላጎት የለኝም (3))
ማቅለሽለሽ (1)	ማስታወክ (3)
የሆድ ድርቀት (1)	ተቅማጥ (3)
የአፍ ውስጥ ቁስለት (2)	የአፍ ድርቀት (1)
የምግቡ ጣዕም አይታወቀኝም (1)	የምግቡ ሽታ አይታወቀኝም (1)
በጥቂት ምግብ ቶሎ እጠግባለሁ (1)	ምግብ ለመዋጥ እጥገራለሁ (2)
ከፍተኛ ድካም አለኝ (1)	ህመም ስለሚያመኝ (ካለ፣ የት?) (3)
ተጨማሪ ካለ ይጠቀሱ (ለምሳሌ፡ የጥርስ ችግር፣ ድባቄ) (1)	

ሳጥን 4: የዕለት ተዕለት እንቅስቃሴ እና ተግባራት የተመለከቱ ጥያቄዎች (ከፍተኛ ነጥብ = 3)

ባለፈው ወር ውስጥ፣ የአካል እንቅስቃሴ እና ብርታቴ

- እንደ ወትሮው ነው፣ ምንም እክል አላጋጠመኝም (0)
- እንደ ወትሮው ባይሆንም በራሴ ተነስቼ የዕለት ተዕለት ተግባራትን በከፊል እፈጽማለሁ (1)
- የመንቀሳቀስ ብዙም ፍላጎት የለኝም፣ ነገር ግን አልጋ ላይ ወይም ወንበር ላይ የማሳልፈው ከግማሽ ቀን በላይ አይሆንም (2)
- የእንቅስቃሴ አቅሜ በጣም ውስን ነው፣ ስለዚህ በቀን አብዛኛውን ጊዜ አልጋ ላይ ወይም ወንበር ላይ አሳልፋለሁ (3)
- ከአልጋ ብዙም አልወጣም/አልነሳም (3)

The professional part of the PG-SGA tool

Worksheet 1 - Scoring weight loss (use 6-month data only if there is no 1-month weight data)

Weight loss in 1 month	Score/Point	Weight loss in 6 months
10% or greater	4	20% or greater
5-9.9%	3	10-19.9%
3-4.9%	2	6-9.9%
2-2.9%	1	2-5.9%
0-1.9%	0	0-1.9%

Worksheet 2 - Disease and its relation to nutritional requirements (give 1 point for each disease)

- | | |
|---|---|
| ☐ Cancer (include the stage) (1) | ☐ AIDS (1) |
| ☐ COPD, TB, or Heart Failure (1) | ☐ Chronic Kidney Disease (CKD) (1) |
| ☐ Pressure ulcer, open wound, or fistula (1) | ☐ Presence of trauma (major surgeries)(1)A |
| ☐ Age greater than 65 years (1) | ☐ Other chronic diseases (specify) |

Worksheet 3 - Metabolic Demand (the score is additive and the maximum point is 9)

Stress	None (0)	Low (1)	Moderate (2)	High(3)
Fever (0-3)	no fever	>37.2 and < 38.3	≥38.3 and <38.8	≥38.8
Fever duration (0-3)	no fever	< 72 hours	72 hour	>72hour
Corticosteroids (0-3)	no steroid	< 10mg Predin/day	≥10 and < 30mg/day	≥30mg/day

Worksheet 4 - Physical Exam: Not additive, the maximum point is “3”

Muscle status

Temporal muscle 0 1 2 3

Clavicles (pectoralis) 0 1 2 3

Shoulders (deltoids) 0 1 2 3

Interosseous muscles 0 1 2 3

Scapula (trapezius) 0 1 2 3

Thigh (quadriceps) 0 1 2 3

Palmar muscles 0 1 2 3

Calf muscles 0 1 2 3

Global muscle status rating 0 1 2 3

Total body deficit rating (0-3)

No deficit (0)

Mild deficit (1)

Moderate deficit (2)

Severe deficit (3)

Fat Stores

Orbital fat pads 0 1 2 3

Triceps skinfold 0 1 2 3

Fat overlying lower ribs 0 1 2 3

Global fat deficit rating 0 1 2 3

Fluid status

Ankle edema 0 1 2 3

Sacral edema 0 1 2 3

Ascites 0 1 2 3

Global fluid status rating 0 1 2 3

Total PG SGA

9.8 CURRICULUM VITAE

Personal Information

- ☐ Full Name -----Beyan Abdela Adem
- ☐ Sex-----Male
- ☐ Date Of Birth-----July 2000
- ☐ Age-----24
- ☐ Place Of Birth -----Haramaya
- ☐ Marital Status-----Single
- ☐ Nationality-----Ethiopian
- ☐ Current Address-----Haramaya
- ☐ Healthy Condition-----Healthy/Excellent
- ☐ Telephone-----+251928198058

Educational background

- BSc in Public Health from Mettu University with **GPA 3.56**

Educational Level	Institution	Duration of time	Field Study	Qualification
Primary Education(1-8)	Sherif Primary	kalid 1998– 2005 E.C	Basic science, social science and art	Certificate
Secondary (9-10)	Haramaya Secondary school	2006-2007 E.C	Natural science	Certificate
Preparatory school(11-12)	Haramaya Preparatory school	2008–2009E.C	Natural science	Certificate
Higher Education	Mettu University	2010-2014 E.C	Public Health	BSc Degree

Language

Language	Speaking	Writing	Reading	Listening
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Amharic	Excellent	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent	Excellent
Afan-Oromo	Excellent	Excellent	Excellent	Excellent
Arabic	Good	Good	Excellent	Excellent

Skills

- Good Communication Skill
- Able to perform software application like SPSS, EPIDATA, STATA, EPI INFO, KOBO TOOLBOX.
- Adapting new environment and situation
- Technical, Human and Conceptual skills
- Community and environmental health practical skill

Personal Interest

- Reading
- Keeping my personal hygiene and the environment I am in.
- Learning new skills
- Gathering update information's and Working in team

Project:

Undergraduate Final year project work titled **CLIENTS SATISFACTION WITH THE PNEUMONIA CARE GIVEN FOR CHILDREN AND ASSOCIATED FACTORS IN METTU KARL HOSPITAL, WASTERN ETHIOPIA.**

Hobbies:

Reading fictional books, retrieving information from different websites for the purpose of personal development and watching podcasts.

REFERENCES

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