ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCENCE

SCHOOL OF NURSING AND MIDWIFERY

PREVALENCE AND RISK FACTORS OF MALNUTRITION AMONG ADULT CANCER PATIENTS RECEIVING CHEMOTHERAPY TREATMENT IN TIKUR ANBESA SPECIALIZED HOSPITAL, ADDIS ABABA, ETHIOPIA, 2019.

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A THESIS SUBMITTED TO THE NURSING DEPARTMENT, SCHOOL OF NURSING AND MIDWIFERY, COLLEGE OF HEALTH SCIENCES, ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN CLINICAL ONCOLOGY NURSING

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This thesis by Tuemay Kiros is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of masters in Clinical oncology nursing.

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I, the undersigned MSc student declare that I have submitted my original work on a title "**Prevalence and risk factors of malnutrition among adult cancer Patients receiving chemotherapy treatment in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2019"** for the examination.

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ACRONYMS AND ABBREVIATIONS

AAU	Addis Ababa University
BMI	Body Mass Index
CRT	Chemo Radio Therapy
CTCA	Cancer Treatment Centers of America
FMOH	Federal Ministry of Health
MST	Malnutrition Screening Tool
NCI	National Cancer Institute
NPC	Nasal Pharyngeal Cancer
NGO	Non-Governmental organization
SGA	Subjective Global Assessment
PG-SGA	Patient Generated-Subjective Global Assessment
QOL	Quality of Life
REC	Research and Ethics Committee
TASH	Tikur Anbessa Specialized Hospital

ABSTRACT

Background: The rise in the incidence of cancer is becoming a great concern to the global community. More than half of cancer patients develop malnutrition in the course of the disease. Malnutrition has serious consequences to treatment outcome and survival of cancer patients.

Objective: the aim of this study is to assess the prevalence and risk factors of malnutrition among adult cancer hospitalized patients in Tikur Anbessa Specialized Hospital Addis Ababa, Ethiopia 2019.

Methods: Cross-sectional study was conducted among a sample of 281 randomly selected cancer patients visiting Tikur Anbessa Specialized Hospital. Data were collected by patient interview and chart review using structured questioner adapted from subjective global assessment tool. Data were analyzed by SPSS version 24.0. Descriptive statics like frequency distribution, mean, median and standard deviation was used to describe characteristics. Bivariate and multivariable analysis using logistic regression models was used to determine the association between predictor variables with the dependent variable.

Result: From the total 281 participated patients in this study, 164(58.2%) had malnutrition. Malnutrition was higher among females 91 (55.5%) compared to males 73(44.5%). The mean BMI was 20.24 ±3.6. Of all 119(42.2%) had moderate weight loss, 101(35.8%) severe weight loss and 147(52.1%) had weight loss in the past two weeks. With regard to functional status 117(41.5%) had mild to moderate loss of strength and 115(40.8%) severe loss of function and strength. In addition, 133 (43.3%) respondents had mild to moderate loss of subcutaneous fat in all areas and 57(20.2%) severe loss of subcutaneous fat in most areas From all types of cancer malnutrition was higher in lung cancer patients 29(64.4%) followed by breast cancer 46(56.8%), colorectal, colon and rectal cancer 36(56.3%), gastric cancer 19(46.3%) and nasal pharyngeal cancer 29(46.3%). Stage four cancer ((AOR= 7.2, 95% CI: 1.3-38.5), loss of appetite (AOR= 4.5, 95%CI; 1.5-17.2) and diarrhea (AOR= 7.8, 95% CI: 2.95-20.5) were significantly associated with malnutrition.

Conclusion and recommendation: Prevalence of malnutrition in hospitalized cancer patients was high. Therefore, early identification of malnutrition and nutritional intervention should be given special attention.

Key word: Cancer, Malnutrition, Prevalence, Adult, Risk Factors

1. INTRODUCTION

1.1. Background

Globally, prevalence of malnutrition is increasing which may vary between 40 and 80 % in patients with neoplasia. A multicenter study found a prevalence of malnutrition of 66.3 % and an increased risk of almost three-fold of malnutrition (20.3 %) among cancer patients. A similar result was found in a study conducted in Latin America with hospitalized patients, which showed a prevalence of 65.6 % of malnutrition in individuals with cancer[1]. In observational study conducted in Portugal, gastrointestinal cancers had shown higher malnutrition prevalence of 30 to 60% [2].

Malnutrition is a frequent problem in cancer patients, whose prevalence and degree mainly depends on tumor stage and site. Even minimal weight loss during chemo/radiotherapy (CRT) is associated with significantly reduced survival[3]. Cancer is a term used to define diseases in which abnormal cells develop without control, these cells develop and invade other cells and spread to different sites in the body causing disease and if left untreated could lead to the death of an individual[4]. Malnutrition is defined as acute or chronic state of nutrition in which a combination of varying degrees of excess or deficiency of nutrients, imbalance of energy and inflammatory activity led to a change in body composition, impairment in function and clinical outcome[5].

A study done in Cancer Treatment Centers of America showed that disease-related malnutrition occurs frequently in patients with cancer and is a major cause of morbidity and mortality. The incidence of malnutrition in cancer patients ranges between 40 and 80% while the prevalence ranges from 50% to 80%[depending on tumor type, tumor location, stage of disease, treatment received and the type of nutritional assessment method used[6].

Malnutrition in cancer patients affects the quality of life (QoL) of patients and brings about adverse outcomes including morbidity and mortality. Cancer and cancer therapy affect nutritional status through alterations on the metabolic system and reduction in food intake. All of the treatments for cancer i.e. systemic chemotherapy, radiation and surgery result in damage to normal tissues, and at the same time produce intense side effects. Chemotherapy

especially is associated with several side effects like nausea, vomiting, oral microsites, xerostomia, diarrhea, constipation, and food aversion which play an important role in decreased food intake, nutrient loss, energy expenditure alterations and weight loss, particularly lean body mass. These conditions predispose patients towards malnutrition, especially when there are frequent and prolonged periods of chemotherapy treatment[7].

Nutrition is an important factor in the treatment and progression of cancer. The majority of cancer patients experience weight loss as their disease progresses and, in general, weight loss is a major prognostic indicator of poor survival and impaired response to cancer treatment. Cancer patients are particularly susceptible to nutritional depletion due to the combined effects of the malignant disease and its treatment. The prevalence and magnitude of diminished nutritional status varies with individual treatment regimens, it is widely accepted that the principal causes related to therapy are the result of commonly experienced side effects such as nausea, vomiting, anorexia, lethargy, diarrhea, esophagitis is, and dysphasia[8].

1.2. Statement of the problem

The growing incidence of cancer in both developed and developing countries is becoming a serious global concern. Malnutrition is one of the causes of high morbidity and mortality among cancer patients. Almost 20 % of cancer death in cancer patients occurs as a result of malnutrition and its complications[9].

Cancer is the second leading cause of mortality in the world. Globally there were 17.0 million new cancer cases and 9.6 million deaths from cancer in 2018. About 70% of cancer related deaths were in low- and middle-income countries[9]. In Ethiopia Cancer is responsible for 5.8% of mortality and 60,960 new cases annually[10]. Malnutrition is a serious problem in cancer patients and its incidence ranges from40-80%. It affects around 15-20% of cancer patients at diagnosis and up to 80-90% of patients with advanced stage5. Studies show low rates of response to treatment among those patients who are malnourished[11].

Malnutrition usually occurs as a result of the interaction between the host and the disease, which results in decreased nutrient intake, loss of appetite, changes in taste, and food aversion, fear, depression, and anxiety[12]. The disease itself and cancer treatment may compromise nutritional status and also survival. Malnutrition in cancer patients have been observed to negatively impact patient's response to therapy; increase the incidence of treatment-related side effects; interrupt serial treatment regimens; extend hospital stay; impair muscle function, performance status, immune function, and quality of life; and ultimately affect survival. Depression, fatigue, and malaise also significantly impact on patient well-being. In addition, cancer-related malnutrition is associated with significant health-care-related costs[13].

This research was done in Republic of Korea. Most cancer patients undergo surgery, radiotherapy, chemotherapy, and/or other treatments depending on the type and stage of cancer; these treatments are associated with various side effects. Among these side effects, loss of appetite, sore mouth or throat, dry mouth, change in taste, vomiting, nausea, diarrhea, constipation, and fatigue can negatively affect dietary intakes[14]. Of people dying from cancer 50% of them were malnourished and up to 20% died from the effects of malnutrition rather than from the cancer itself [13].

Although, people with cancer are at high risk of malnutrition, therapy (surgery, chemotherapy and radiotherapy) is started in Ethiopia without knowing their nutritional status. Since malnutrition in individuals with cancer has effect on the treatment responses and survival of patient's early assessment of nutritional status is important for nutritional therapy and thereby increasing the survival of patients. To our knowledge no previous research was done in Ethiopia. This study intended to assess the prevalence and risk factors of malnutrition among adult cancer hospitalized patients Attending Tikur Anbessa Specialized Hospital, Ethiopia.

1.3. **Ssignificance of the study**

Malnutrition is common health problem in cancer patients without mentioning more on prevalence and risky factors [13]. Cancer prevalence was increasing in Ethiopia, there is no sufficient study conducted on the prevalence of malnutrition and associated factors among adult cancer hospitalized patients. Understanding the prevalence and risk factors of malnutrition among patients help policy makers, program planners and educators to design appropriate strategy to address the problem.

With the increasing incidence of adult cancers, it is important that service providers, physicians, nurses and medical officers understand the effects of chemotherapy on nutritional status of patients in-order to manage cancers properly. This will greatly improve the outcomes in survival and reduce the morbidity and mortality associated with late diagnosis of malnutrition. Determining the prevalence of nutrition-impact symptoms among adults with cancer will further bolster the creation of a nutrition intervention. The study findings will also contribute to the field of knowledge in nutrition and act as a basis for future research.

Patients might have no information about chemotherapy and radiotherapy experience side effects such as lack of appetite, nausea, vomiting and diarrhea and how good nutrition practices could help them to respond well to therapy. Therefore, the finding of the study will help as a basis for patient education about nutrition.

Therefore, this study will be helpful in extending understanding the prevalence of malnutrition and associated factors amongst adult cancer patients. Moreover, it will help health care providers to initiate early investigating and management of malnutrition. Hence early detection of malnutrition and giving nutritional support for malnourished hospitalized patients will reduce mortality, morbidity, long stay in the hospital, enhance healing process, decrease cost, reduce burden for the patient, health workers, and hospital and prevent complications.

2. LITERATURE REVIEW

2.1. Cancer and malnutrition

The research done in Brazil showed that malnutrition is caused by several factors and may vary according to the type of tumor, its stage and treatment used. Malnutrition in cancer patients is frequently reported in the literature and found in almost 75% of the patients at diagnosis. It is also significantly associated with increased morbidity and mortality, reduced response and tolerance to treatment, higher costs, diminished chances of survival and worse Quality Of Life[11]. Finding from Italy malnutrition and weight loss are common and may be due to several mechanisms including cancer and host response to tumor and anticancer therapies. Malnutrition has been associated to several clinical consequences, including quality of life impairment, decreased treatment response, high risk of chemotherapy induced toxicity and survival reduction[15].

A descriptive study in Korea Malnutrition in cancer patients is more serious than in patients with other chronic diseases and the prevalence of malnutrition in cancer patients has been reported to range from 40 to 80 % and 30% to 87% of cancer patients are diagnosed with malnutrition ,and 30–60% of cancer patients diagnosed with protein-calorie malnutrition[13]. Malnutrition in cancer may lead to infection, electrolyte imbalance, altered skin integrity, anemia, anorexia, fatigue and immune deficiency. In addition, changes in protein metabolism may provoke loss of appetite and bodyweight as well as cachexia[16].

2.2. Prevalence of malnutrition

According to Brazil study in SGA scale, the majority of the patients were classified as moderate or suspected malnutrition (66.2%) followed by severe malnutrition (20.8%). Another study in the same country found similar results, being 72.3% of patients were classified as moderate or suspected malnutrition and 17.8% as severely malnourished. Reported 80% prevalence of malnutrition or risk of malnutrition, which was also identified according to BMI classification, where found a high prevalence of malnourished individuals. In a study of Borges et al 16, unlike the studies cited above,70.7% the sample was well nourished and only 4.2%had severe malnutrition[11].

The prospective, observational study conducted in Italy medical oncology center at 22 centers across Italy reveals high prevalence of cancer-related malnutrition and its negative consequences are taken too lightly in most oncology units. Studies from Germany, France, Spain, and Brazil reported malnutrition prevalence ranging from 25% to over 70% based on nutritional assessments[17]. A study done at Malaysia the prevalence of malnutrition among adult cancer patients has been estimated to range between 15% to 80% with the main symptoms being weight loss and asthenia of varying degrees while studies of hospitalized patients with cancer indicate that 56% to 76% of patients are either malnourished or at risk of being malnourished [18].

Finding from Korea showed that about 61% of hospitalized patients were malnourished and the prevalence of malnutrition was higher in male patients with longer hospital stays (60.2%, and readmitted patients (66.6%). Patients with liver and lung cancer (86.6% and 60.5%, respectively) and patients with advanced cancer stage (60.5%, III or IV) had a higher prevalence of malnutrition than other patients [20]. Malnutrition is more prevalent among cancer patients than for the general population; with rates varying depending on the diagnosis. It has been reported that up to 85%of patients with certain cancer diagnoses may experience weight loss. A weight loss of even 5% has been associated with decreased response to treatment and a lower rate of survival. reported a frequency of weight loss due to malnutrition, ranging from 31% to 87%, depending on tumor site and stage, with the highest occurrence found in patients with cancer of the aero digestive tract (the organs and tissues of the respiratory tract and the upper part of the digestive tract, collectively)[19]. A prospective study was done in India three weeks after the treatment, all the patients had weight loss from 1-3 kg.[21].

Cross-sectional study conducted in the Iran the prevalence of malnutrition among the patients was 53.1% out of which 29.1% had moderate and 24% had severe malnutrition. The most common factors inducing nutritional symptoms were depression and anorexia[22]. An observational study was conducted in India the prevalence of weight loss shows that 54.39% of the participants had weight loss of more than 3% in the last month or 5% over 6 months which is an early sign of malnutrition[23]. Another descriptive, cross-sectional was done in Iran the prevalence of subjective global assessment(SGA-C) between two genders showed 54% for males and 46% for females with no significant difference[22]. An observational study done in India the prevalence of moderate to severe malnutrition in the patients was 84.21% patient generated-subjective global assessment (PG-SGA) and the prevalence of under nutrition was 56.14% (BMI)[8]. A prospective study was done in India based on the obtained results it has been established that 15 patients (14%) are severely undernourished (SGA C), 39 patients (38%) are moderately undernourished (SGA B), while 49 patients (48%) are well-nourished (SGA A)[21].

2.3. Risk factor of malnutrition

A cross-sectional study on nutritional assessment in cancer patients in Iran 50.4% of patients had less food-intake. The most frequent nutrition symptoms causing food-intake reduction over a month were depression (38.8%), anorexia (37.8%), dry mouth (32.5%), nausea (25%) and pain (23.1%)[22]. The study was a prospective conducted in the India nutritional status of each subject was assessed based on nutritional parameters i.e. Anthropometric [BMI (body mass index like nausea, vomiting, oral microsites, xerostomia, diarrhea, constipation, and food aversion which play an important role in decreased food intake, nutrient loss, energy expenditure alterations and weight loss, particularly lean body mass. These conditions predispose patients towards malnutrition, especially when there are frequent and prolonged periods of chemotherapy treatment[7].

Cancer patients receiving chemotherapy, radiation therapy, and combination therapies report both taste and smell alterations of varying intensities, time to occurrence, and duration. Of patients who report alterations in taste and smell, 56.3% are only receiving chemotherapy; 66.5%, radiation therapy; and 76%, combination therapy. It is also estimated that over 50% of patients develop a food aversion after chemotherapy and decreased oral intake leads to involuntary weight loss and ultimately malnutrition[13].

An observational study done in India most common cause of food-intake reduction during the past two weeks were; no appetite (38.60%), nausea (43.86%), constipation (15.79%), mouth sores (17.54%) and pain (8.77%)[8]. Over the years, anorexia, reduced food intake leading to malnutrition and consequences of malnutrition, has been well recognized and documented in cancer patients at diagnosis, during treatment as well as post treatment and recovery period. Anorexia can be defined as a lack of appetite or loss of desire to eat resulting in the involuntary decline in food intake contributing to malnutrition[13]. A descriptive cross-sectional study was done in Korea 69% patients have alter food intake via anorexia, cachexia, nausea/vomiting, and taste/smell changes may lead to malnutrition due to systemic cancer[16].The prospective, observational study conducted in Italy medical oncology center at 22 centers across Italy. Due to loss appetite (anorexia (49.2% of women and 52.9% of men) had nutritional impairment, including risk of malnutrition and overt malnutrition[17].

A cross-sectional study was done in Malaysia the proportion of respondents diagnosed with cancer at stage 1 and 2 were 7.2 % and 13.3%, respectively; 26.5% participants presented with late locally advanced cancer (i.e. Stage 3) and 53% were in metastasized stage of the disease (i.e. Stage 4). In terms of malnutrition status at the various stages of cancer, 56.9% and 21.6% of the respondents were at risk of malnutrition at Stage 4 and Stage 3 cancer, respectively[18]. A descriptive, cross-sectional was done in Korea Malnutrition was present in 48.0 % of patients with stage 1 cancer, 42.9 % with stage 2,65.0 % with stage 3, and 55.6 % with stage 4[16].The research done in Spain incidence of malnutrition varies according to the type of tumor and stage. By type of tumor, its prevalence is 86% in pancreatic cancer, 48–61% in lymphomas with poor prognosis and colorectal cancer, up to 46% in urological and pulmonary tumors; and 30–40% in good prognosis lymphoma, breast cancer, and sarcomas[24].

A cross-sectional study was done conducted in Malaysia about 36.7% of the respondents were at risk of malnutrition under age group 56-65 years and 28.3% for the age group 46-55 years. The majority (51.7%) of respondents at risk of malnutrition were women. For ethnicity, 51.7% of Malays were at risk of malnutrition, followed by Chinese (23.3%) and Indian (21.7%) according to MST. About 35.9% and 25.6% of respondents who were malnourished were in the age group of 56-65 years and 46-55 years respectively. According to SGA, 56.4 % of malnourished respondents were men. Most of the moderately malnourished respondents were diagnosed with NPC (30.7 %) and lung cancer (20.5 %). By ethnicity, about 53.9% of malnourished patients were Malay, followed by Indian (23.1 %) and Chinese (17.9 %)[18].

The prospective, observational study conducted in Italy medical oncology center at 22 centers across Italy. Malnutrition also increased financial costs for managing cancer patients, including costs for longer hospital stays, payment of cancer treatment and higher rates of complications following cancer related surgery[17].The prospective, observational study conducted in Italy medical oncology center at 22 centers across Italy When cancer-related malnutrition goes untreated, consequences can be serious. Malnourished colorectal cancer patients tolerated fewer cycles of chemotherapy, while other cancer patients with [17]. Anorexia or reduction of nutritional intake has been reported to be tumor-related as well as treatment-related. Stenosis of the GI tract, Dysphagia, and previous surgery may affect the digestive capacity, or an abdominal tumor mass disturbance of the motility or repeated (sub) ileus may contribute to nausea and vomiting and therefore to reduced nutrient intake[13].

The prospective, observational study conducted in Italy medical oncology center at 22 centers across Italy. malnutrition related site of primary tumor, patients with the highest frequency of malnutrition/under nutrition qualifying were those with gastro esophageal, pancreatic, head and neck, and lung tumors[17]. A cross-sectional study was done in Malaysia most of the moderately malnourished respondents were diagnosed with nasal pharyngeal cancer NPC (30.7 %) and lung cancer (20.5 %)[18]. A descriptive, cross-sectional was done in Korea malnutrition was present in 47.9 % of patients with cervical cancer, 52.8 % of patients with ovarian cancer, and 60.0 % of patients with endometrial cancer[16]. Korean study stage III or IV stomach cancer (46.5%) compared with other cancers (liver cancer 53.3%, colorectal cancer 61.9%, and lung cancer 81.3%)[20].

Conceptual frame work

By considering the above review, the conceptual framework was developed by assuming how the particular variables in the study connect with each other and identifies the variables required in the research investigation.

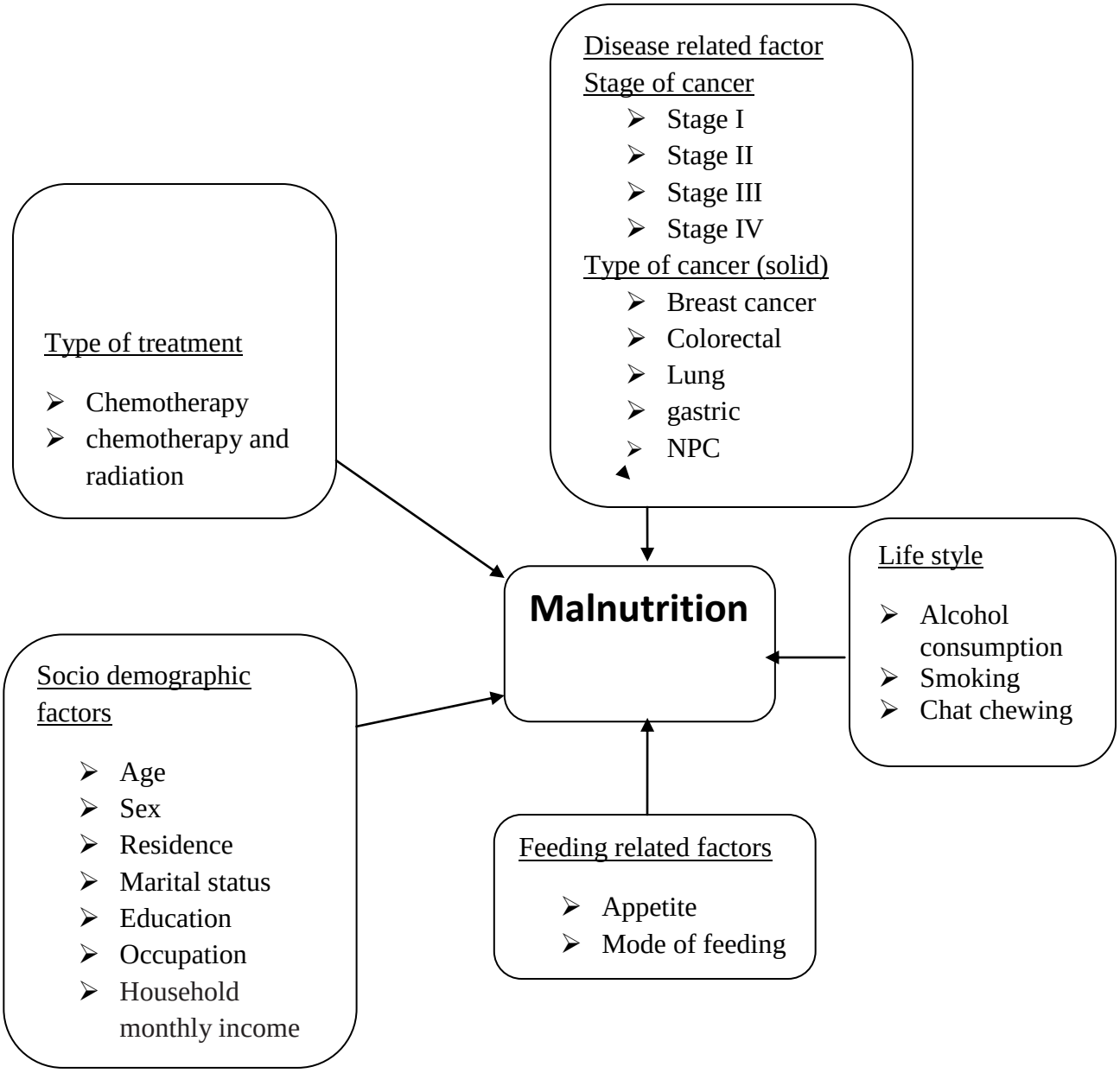

Figure 1: Conceptual frame work for prevalence and risk factors of malnutrition among adult cancer patients receiving chemotherapy treatment in TASH, 2019.

3. OBJECTIVES

3.1. General objective

To assess the prevalence of malnutrition and risk factors among adult cancer patients receiving chemotherapy treatment at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2019.

3.2. Specific objectives

- To determine the prevalence of malnutrition among adult cancer patients receiving chemotherapy treatment in tikur anbessa specialized hospitals, Addis Ababa, Ethiopia 2019.
- To identify risk factors of malnutrition among adult cancer patients receiving chemotherapy treatment in tikur anbessa specialized hospitals, Addis Ababa, 2019.

4. METHODS AND MATERIALS

4.1. Study area and period

The study was conducted at Tikur Anbessa Specialized Hospital (TASH) oncology unit in 2019. Addis Ababa is the capital city of Ethiopia. The city has ten sub cities and 116 districts. Tikur Anbessa Specialized Referral Hospital is government owned large referral and teaching hospital, located in Lideta sub-city under the administration of Addis Ababa University, College of Health sciences.

TASH is a tertiary teaching hospital with 700 beds and give service for about 370,000 to 400,000 patients per year. The oncology center at the Hospital is the only referral center in the country. The oncology unit is giving service for more than 60,000 cancer patients annually and has an outpatient, in-patient (33beds), radiotherapy, and chemotherapy and surgery care service. There are 6 senior oncologists, 25 residents and 30 nurses and 6 oncology nurses and 8 pharmacists, 5 radiologists, 4 medical physicists working in the unit. The study was conducted from February to March 2019 at the oncology unit of TASH, College of Health Sciences, and Addis Ababa University, Ethiopia (26).

4.2. Study design

Institution based cross-sectional study was conducted.

4.3. Source population

The source population for this study was all adults diagnosed with cancer and treated with chemotherapy at Tikur Anbessa Specialized Referral Hospital, Addis Ababa Ethiopia.

4.4. Study population

All adults diagnosed with cancer and treated with chemotherapy at Tikur Anbessa Specialized Referral Hospital in the time interval of the study period, Addis Ababa, Ethiopia.

4.5. Eligibility criteria

4.5.1. Inclusion criteria

- 18 years of age or older
- Competent subject who can give written informed consent
- All adult in patient and out patients taking chemotherapy treatment above 3 cycle

4.5.2. Exclusion criteria

- Below 3 cycle treatment of chemotherapy
- Ongoing radiation treatment
- Ongoing treatment of brachytherapy
- Hormonal therapy
- On follow up cancer patient
- New cancer diagnosed

4.6. Sample Size determination

Sample size for the study was computed based on a single proportion population formula with the prevalence of 50% because there is no previous similar study in Ethiopia and taking the margin of error 5%.

Where:

- Malnutrition prevalence(P) = prevalence rate, p is taken as 50%
- Margin of error(d) =5 %,
- Confidence level (CI) = 95%
- n= Sample size
- Z= Value of standard normal distribution (Z-statistic) at 95% confidence level

(Z=1.96)

$$n = \frac{z^2_{\alpha/2} \times p(1-P)}{d^2}$$

$$n = \frac{(1.96)^2 \text{x } (0.5)\ (1\text{-}0.5)}{(0.05)^2}$$

n= **384**

Since flow of patients during data collection period is less than 10,000 then correction formulas was be applied. NF= $\frac{n}{1+\frac{n}{N}} = \frac{384}{1+\frac{384}{860}}$ = 266 NF= desired sample size

n= the calculated sample size N= total population

After adding 10% non-response rate the final sample size will be **281.**

4.7. Sampling procedure

Tikur Anbessa Specialized Hospital (TASH) is selected for this study because it is the only public hospital treating cancer patients from all over the country. From the oncology unit of TASH patients who can fulfill the criteria were identified from their charts each day. Systematic sampling method was used to determine the number of study participants. Every Kth patient was identified until the required sample size is reached during the study period. The samples size was allocated proportionally to the size of inpatient and outpatient cancer treatment attendants using the previous month's rate of flow of the cases.

According to the one-year record of adult receiving chemo therapy treatment cancer, 9000 cases were seen in the oncology unit at Tikur Anbessa Specialized Hospital (TASH). Since the duration of the study was four weeks, the flow within the study period was 750 cases that come for treatment during data collection period. Based on systematic random sampling technique every 2 study participants was enrolled in the study.

4.8. Operational definition of terms

Adult oncology patients: Patients above 18 years of age receiving chemotherapy treatment for cancer disease in the oncology wards.

Malnutrition: is characterized by the presence of two or more of the following characteristics: insufficient energy intake, weight loss, loss of muscle mass, and loss of subcutaneous fat, localized or generalized fluid accumulation or decreased functional status.

Nutritional Status: Nutritional conditions of a subject were classified according to BMI. It is calculated the ratio of weight to height in meters squared.

Nutrient intake: Type and amount of selected nutrients (energy, protein, calcium, sodium, iron, zinc, dietary fiber, vitamin C and folic acid) consumed by adult oncology patients with reference to recommended dietary intakes.

Diet satisfaction: This refers to patient's perceptions and acceptability of hospital food based on selected aspects like variety, type, portion size, temperature, taste, appearance, time of distribution, overall quality and attitude of hospital staff serving food.

SGA Score of nutritional status: According to the sum of points assigned to each item, patients were initially classified in: Well-nourished: < 17 points. Malnourished (moderate and severe): ≥ 17 points.

4.9. Data collection procedures

Data were collected by using pretested global assessment tool .The tool was adopted from similar studies from India[25]. And was prepared in English then translated to Amharic and retranslated back to English to check for consistency of meaning. One day training was given for two female and two male nurses who were oncology nurses. The training focused mainly on the aim of the study, on each part of questionnaires, about consents, the right to participate or not, the right to with draw at any time, confidentiality, and how to approach. Data were collected from February 1-15/2019.

Data were collected from two sources. The primary data source was responses of sampled respondents that are eligible for interview and from their medical records.. The SGA tool was adopted from India modifications on gastrointestinal surgical oncology malnutrition screening cancer patients. Pre-testing of the questionnaire was undertaken in 5% of the sample size in other sites before the actual data collection took place and corrections on the instruments was made accordingly. Data were checked daily for completeness by the supervisors and the principal investigator. The overall data collection was supervised by the principal investigator.

4.10. Variables

4.10.1. Dependent variables

- Prevalence of Malnutrition

4.10.2. Independent variables

- Sociodemographic factors: Age, sex, residence, marital status, education, occupation and household monthly income, weight, height
- Disease related factor: Type of cancer and stage of cancer
- Treatment related factor: Type of treatment
- Feeding related factors: Appetite status, mode of feeding and mobility
- Life style: Alcohol consumption, smoking and chat chewing

4.11. Data analysis

Collected data was checked at the end of each data collection day for its completeness. The collected data was coded, entered and cleaned, using Epi data version 3.1, software. Then it was exported to SPSS version 24.0 for analysis. During process of analysis frequency distribution and percentage of variables was computed to describe and summarize the basic socio-demographic characteristics of the respondents.

The result was illustrated in the form of frequency tables; pie charts and graphs in order to give a quick glance of the variables. The proportion of malnutrition with its 95%CI was being computed. Bivariate and multivariable analysis using logistic regression model was used to determine the association between predictor variables with the dependent variable (malnutrition). First bivariate relationship between each independent variable and outcome variable was being investigated using a binary logistic regression analysis. The variables which showed significant association on bivariate analysis with p-value of <0.25 was used for multivariate logistic regression. Multivariate logistic regression analyses was used to minimize the effect of confounding variables and to identify the major factors of malnutrition To assess the strength of relationship between dependent and independent variables, adjusted odds ratio with its 95% confidence interval and p-value<0.05 was used.

4.12. Data quality assurance

To ensure the quality of data the following measures were undertaken. Pre-testing of the questionnaire was undertaken in 5% of the sample size in amstegna police tabya cancer center before the actual data collection take place and corrections on the instruments was made accordingly. A total of one day intensive training was given for all supervisors and data collectors. Data was checked for completeness, clarity and consistency by the supervisors and the principal investigator on daily bases. Finally, the data collectors collects the filled questionnaires and supervisors cross check the completeness of the questionnaire. The overall data collection process was monitored by the principal investigator.

4.13. Ethical considerations

Ethical clearance was obtained from Research and Ethics Committee (REC) of School of Nursing and midwifery. A letter was written from School of Nursing and midwifery to TASH.

Informed verbal consent was obtained from each respondent after providing sufficient information on the purpose and procedure of the study and the right of participant.

4.14. Dissemination of the results

The study finding will be given to Addis Ababa University College of health science department of nursing and midwifery and it will be disseminated to FMOH, Policy makers, to studied health institution (TASH). Furthermore, the paper will be presented on workshops, seminars. Finally, the manuscript will be submitted to scientific journals for possible publication.

5. RESULTS

5.1. Sociodemographic characteristics of adult cancer patients

A total of 281 respondents participated in the study with 96% responses rate. From 281 respondents 145 (54.4%) were females. The mean ages of the participants were 44.51 ± 13.45. From the total cancer patients 257(91.1%) were <65 where as 25(8.9%) were > 65 years of age. From the participants 69(24.5%) were with no formal education and 50(17.7%) of them attended higher education. Regarding region 91(32.4%) were from Oromo, 71(25.3%) from Amhara, 43(15.3%) from Tigray, 39(13.9%) from SNNPR and 23(8.2%) from Addis Ababa. Majority 162(57.4%) of the participants are urban residents. A total of 167(59.2%) of the respondents are married.

Table 1: Sociodemographic characteristics among adult cancer patients receiving chemotherapy treatment in Tikur Anbessa Specialized Hospital Addis Ababa, Ethiopia, 2019(n=281)

Characteristics	**Category**	**n (%)**
Age	<65	257(91.1%)
	≥65	25(8.9%)
	Mean(±SD)	44.51 ± 13.45
	Range	19-83
Sex	Male	136(48.4%)
	Female	145(51.6%)
Residence	Urban	162(57.4%)
	Rural	119(42.2%)
Region	Oromo	91(32.4%)
	Amhara	71(25.3%)
	Tigray	43(15.3%)
	SNNPR	39(13.9%)
	A.A	23(8.2%)
	Others	14(4.98.0%)
Religion	Orthodox	171(60.6%)
	Muslim	59(20.9%)
	Protestant	38(13.5%)
	Catholic	10(3.5%)
	Others	3(1.1%)
Marital status	Married	167(59.2%)

	Single	66(23.4%)
	Divorced	28(9.9%)
	Widowed	20(7.1%)
Occupation	Farmer	67(23.8%)
	Merchant	59(20.10%)
	Government employee	57(20.2%)
	Self employee	58(20.6%)
	Student	24(8.5%)
	Other	14(4.9%)
Income	≤ 500 birr	80(28.4%)
	500-1600birr	65(23.0%)
	> 1600	136(48.2%)
Education	No education	69(24.5%)
	Primary education	83(29.4%)
	Secondary education	79(28.0)
	higher education	50(17.7%)

5.2. Lifestyle: Alcohol consumption, cigarette smoking and chat chewing among adult cancer patients.

Over all 36(12.8%) had history of alcohol consumption, 32(11.3%) history of smoking and 32(11.3%) history of chat chewing. ((Figure 2).

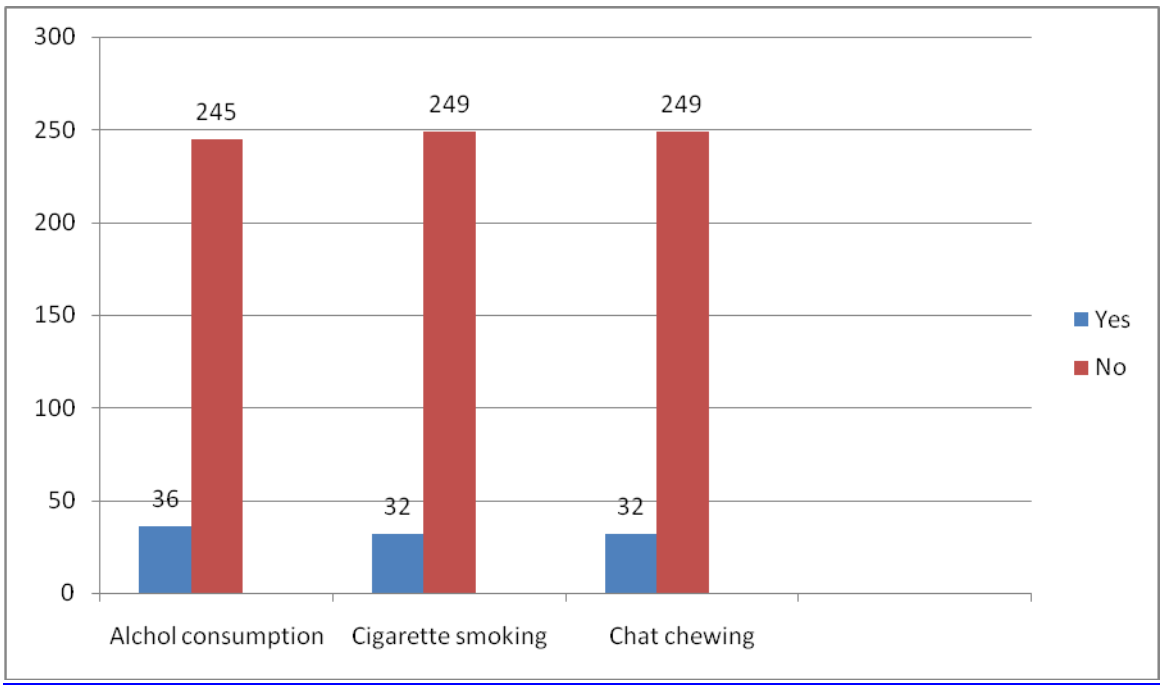

Figure 2: Alcohol consumption, cigarette smoking and chat chewing among adult cancer patients receiving chemotherapy treatment in Tikur Anbessa Specialized Hospital Addis Ababa, Ethiopia, 2019(n=281)

5.3. Disease and treatment related factors among adult cancer patients

Of the 281respondents, 41(14.5%0 had pre-existing co morbidities and 41(14.5%) had a family history of cancer. With regard to the type of cancer 81 (28.8%) had breast cancer, 64 (22.8% colorectal, colon and rectal cancer), 43 (15.3%), lung cancer 41 (14.5%) gastric cancer 39(13.9%) nasopharyngeal cancer and others13 (4.6%) (Table: 2).

The proportion of respondents diagnosed with cancer at stage I were 13(4.6%) and stage II were 74(26.2%); stage III 98 (34.8%), stage IV 79(28.0%) and 17(6.0%) unknown. ((Table: 2).

Concerning the treatment type 206(73.0%) of the respondents were on chemotherapy, 49(17.4%) chemotherapy and surgery and 26(9.2%) were on both chemotherapy and radiotherapy treatment ((Table 2).

Table 2: Disease and treatment related factors among adult cancer patients receiving chemotherapy treatment Tikur Anbessa Specialized Hospital Addis Ababa, Ethiopia, 2019(n=281)

Characteristics	**Category**	**n (%)**
Family history of	Yes	41(14.5%)
cancer	No	240(85.1%)
co morbidity	Yes	41(14.5%)
	No	240(85.1%)
Types of cancer	Breast cancer	81(28.8%)
	Colorectal	64(22.8%)
	Lung	43(15.3%)
	Gastric	41(14.5%)
	Nasopharyngeal	39(13.9%)
	Others	13(4.6%)
Stages of cancer	Stage one	13(4.6%)
	Stage two	74(26.2%)
	Stage three	98(34.8%)
	Stage four	79(28%)
	Unknown	17(6%)
Type of treatment	Chemotherapy	206(73%)
	Chemotherapy surgery	49(17.4%)
	chemo radiation	26(9.2%)
Cycle	Third	72(25.5%)
	Fourth	81(28.7%)
	Fifth	60(21.3%)
	Sixth	68(24.4%)

5.4. Feeding habit and nutritional status among adult cancer patients

Regarding feeding habit 206(73.0%) respondents take semi-solid food, 38 (13.5%) liquid diet, 31(11.0%) solid diet and 6(2.1%) were on tube feeding. Nearly half of the respondents 139 (49.3%) took food regularly. A total of 46(16.3%) respondents had problem during chewing/eating, 61(21.6%) pain during swallowing, 224(79.4%) had loss of appetite, 211(74.8%) feel nausea, 168(59.6%) had vomiting and 76(27%) had diarrhea (Table 3).

The nutritional status of respondents shows that the mean BMI was 20.24 ±3.6 and 107(37.9%) were underweight. The prevalence of malnutrition is 164(58.4%) (Table 3 and graph).The prevalence of malnutrition was higher among female patients 91(62.8%) compared to males (73 (53.7%)

Table 3: Feeding habit and nutritional status among adult cancer patients receiving chemotherapy treatment in Tikur Anbessa Specialized Hospital Addis Ababa, Ethiopia, 2019(n=281)

Characteristics	**Category**	**n(%)**
Route of feeding	Solid	31(11.0%)
	Semi solid	206(73.0%)
	Liquid	38(13.5%)
	Tube feeding	6(2.1%)
BMI	<18.5	107(37.9%)
	18.5-24.9	149(52.8%)
	25-29.9	18(6.5%)
	>30	7(2.5%)
Problem During chewing/eating?	Yes	46(16.3%)
	No	235(83.3%)
Pain during swallowing	Yes	61(21.6%)
	No	220(78.0%)
Loss of appetite	Yes	224(79.4%)
	No	57(20.2%)
Feel nausea	Yes	211(74.8%)
	No	70(24.8%)

Vomiting	Yes	168(59.6%)
	No	113(40.1%)
Diarrhea	Yes	76(27%)
	No	205(72.7%)
Constipation	Yes	138(48.9%)
	No	143(50.7%)
How much do you eat within 24 hours	Regular	139(49.3%)
	Irregular	98(34.8%)
	I do not know	44(15.6%)
Weight loss in the past 3 months?	Yes	195(69.1%)
	No	86(30.5%)
feeding habit in the last week	Decreased	166(58.9%)
	Not decreased	115(40.8%)
eating of breakfast habit	Regular	215(76.2%)
	Not regular	66(23.4%)
How many times do you eat per day	once	2(7%)
	twice	95(33.7%)
	three times	151(53.5%)
	four times	33(11.7%)
Fasting state	Yes	56(19.9%)
	No	225(79.8%0)
How much fluid do you take per day	less than 3 litters	82(47.9%)
	3-5 litters	135(47.9%)
	more than 5 litters	64(22.7%)
How did you eat	I cannot eat without support	64(22.7%)
	partially support by others	84(29.8%)
	I can eat without any	133(47.3%)

	support	
Can you walk?	Yes	251(89.0%)
	NO	30(10.6%)

The Subjective global nutritional assessment findings on table 4 shows that 81(28.7%) respondents had decreased food intake, 36(12.8%) were unable to eat, 119(42.2%) had moderate weight loss, 101(35.8%) severe weight loss and 147(52.1%) had weight loss in the past two weeks. Of all 120 (42.6%) had mild to moderate stress and 117(41.5%) severe stress. With regard to functional status 117(41.5%) had mild to moderate loss of strength and 115(40.8%) severe loss of function and strength. In addition, 133 (43.3%) respondents had mild to moderate loss of subcutaneous fat in all areas and 57(20.2%) severe loss of subcutaneous fat in most areas. Furthermore, 114(40.4%) respondents had mild to moderate edema, 9(3.2%) severe edema, 61(21.6%) mild to moderate ascites and 7(2.5%) severe ascites.

Table 4: Nutritional assessment based on Subjective global assessment among adult cancer patients receiving chemotherapy treatment in Tikur Anbessa Specialized Hospital Addis Ababa, Ethiopia, 2019(n=281)

Characteristics	**Category**	**n (%)**
A.1 –Weight change over 6 months	Weight gain	62(21.6%)
	Moderate weight loss	119(42.2%)
	Severe weight loss	101(35.8%)
A.2 – Weight change in past 2 weeks	Weight is increasing	52(18.5%)
	No change in weight	82(29.1%)
	Weight is decreasing	147(52.1%)
A.3 – Change in dietary intake	No change or slight change for short duration	82(29.1%)
	Intake borderline and decreasing;	118(41.8%)
	Intake poor and decreasing	81(28.7%)
A.4 – Duration and degree of change	Less than 2 weeks, little or no change	107(39.9%)
	More than 2 weeks, mild to moderate suboptimal diet	138(48.9%)
	Unable to eat or starvation	36(12.8%)
A.5 – Presence of GI symptoms	Few or no symptoms intermittently	117(41.5%)
	Some symptoms for >2 weeks; severe symptoms that are improving	123(43.6%)
	Symptoms daily or frequently >2 weeks	41(14.5%)
A.6 –Functional	full functional capacity;	49(17.4%)

status	Mild to moderate loss of strength, stamina some loss of daily activity or severe loss but now improving	117(41.5%)
	Severe loss of function, stamina and strength	115(40.8%)
A.7 – Disease state and co-morbidity	No stress	44(15.6%)
	Low or moderate stress	120(42.6%)
	High stress	117(41.5%)
B.1 – Subcutaneous loss of fat	Little or no loss	81(28.7%)
	Mild-moderate in all areas; severe loss in some area	133(43.3%)
	Severe loss in most areas	67(23.8%)
B.2 – Muscle thinning	Little or no loss	98(34.8%)
	Mild to moderate in all areas; severe loss in some areas	116(41.3%)
	Severe loss in most areas	57(20.2%)
B.3 – Edema	Little or no edema	158(58%)
	Mild to moderate edema	114(40.4%)
	Severe edema	9(3.2%)
B.4 – Ascites	No ascites or only on imaging	213(75.5^)
	Mild to moderate ascites or improving clinically	61(21.6%)
	Severe ascites or progressive ascites	7(2.5%)

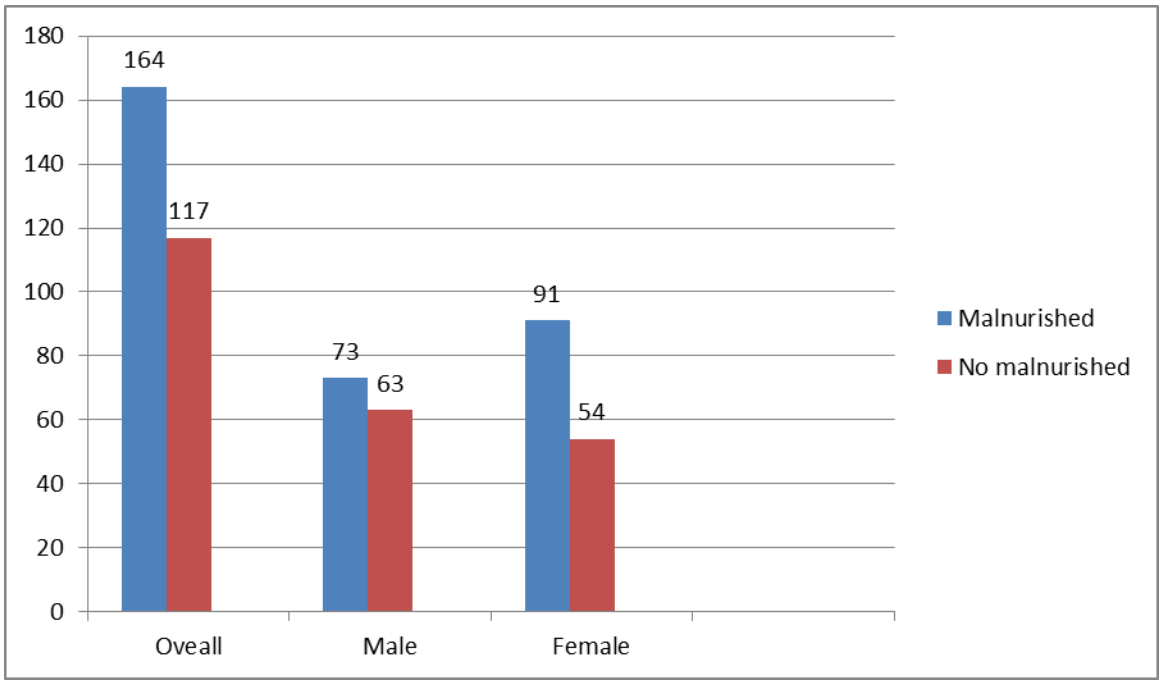

Figure 3: Prevalence of malnutrition among adult cancer patients receiving chemotherapy treatment in tikur anbessa specialized hospital Addis Ababa, Ethiopia, 2019(n=281)

5.5. **Disease and treatment related factors and nutritional status among adult cancer patients**

The nutritional status of patients in relation to disease and treatment related factors are shown in table 5. From all types of cancer malnutrition was higher in lung cancer patients 29(64.4%) followed by breast cancer 46(56.8%), colorectal, colon and rectal cancer 36(56.3%), gastric cancer 19(46.3%) and NPC 29(46.3%). From the stage of cancer malnutrition was higher among stage four 59 (74.7%) and stage three 57 (58.2%) patients. Regarding type of treatment malnutrition was higher among patients on chemoradiation19 (73.1%) followed by chemo surgery 29 (59.2%) and then chemotherapy treatment116 (56.3%). Malnutrition was higher in patients in the fifth 43 (71.7%) and fourth 54(66.7%) cycle of treatment.

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Table 5: Disease and treatment related factors and nutritional status among adult cancer patients receiving chemotherapy treatment in Tikur Anbessa Specialized Hospital Addis Ababa, Ethiopia, 2019(n=281).

	Malnourished	**Not Malnourished**
Type of cancer		
Breast	46(56.8%)	36(43.2%)
Colorectal, colon and rectal	36(56.3%)	28(43.8%)
Lung	29(64.4%)	16(35.6%)
Gastric	19(46.3%)	22(53.7%)
NPC	29(74.4%)	10(25.6%)
Stage of cancer		
Stage one	5(38.5%)	8(61.5%)
Stage two	35(47.3%)	39(52.7%)
Stage three	57(58.2%)	41(41.8%)
Stage four	59(74.7%)	20(25.3%)
Type of treatment		
Chemotherapy	116(56.3%)	90(43.7%)
Chemo radiation	19(73.1%)	7(26.9%)
Chemo and surgery	29(59.2%)	20(40.8&)
Cycle of treatment		
Third cycle	34(47.2%)	38(52.8%)
Fourth cycle	54(66.7%)	27(33.3%)
Fifth cycle	43(71.7%)	17(28.3%)
Sixth cycle	33(48.5%)	35(51.5%)

5.6. Bivariate and multivariate analysis of risk factors associated with Malnutrition

Bivariate and multivariate logistic regression analyses were done to analyze factors associated with malnutrition (Table 6 and 7). Age, level of education, income, stage four cancer, loss of appetite, BMI, problem during chewing, pain during swallowing, diarrhea, vomiting and nausea were significantly associated with malnutrition in bivariate analysis.

After controlling the effect of potentially confounding variables using multivariable logistic regression model, variables such as stage of cancer, loss of appetite and presence of Diarrhea were significantly associated at p value < 0.05. Accordingly, stage four cancer patients are 7.2 times more likely to have malnutrition than those with stage one [AOR =7.2, 95% CI 1.3-38.51)]. In addition those with loss of appetite are 4.5 times more likely to have malnutrition than with no appetite loss (AOR =4.5, 95% CI 1.5-17.2). Further more adult cancer patients with the presence of diarrhea are 7.83 times more likely to have malnutrition than those with no diarrhea (AOR =7.8, 95% CI 2.95-20.5).

Table 6: Bivariate and multivariate analysis of Sociodemographic characteristics with malnutrition among cancer patients in Tikur Anbessa Specialized Hospital, 2019(n=281)

Variable	Malnutrition		COR (95% CI)	P-value	AOR (CI=95%)	p-value
	Yes	No				
Age>65	9(62.5%)	15(37.5%)	2.5(1.07-6)	0.035	2.5(.65-9.5)	0.2
income	49(61.3%)	31(38.8%)	2.6(1.4-4.9)	0.03	1.7(0.49-6.03)	0.4
no education	43(62.3%)	26(37.7%)	2.9(1.4-6.3)	0.005	0.9(0.18-4.6)	0.92
Primary education	58(69.9%)	25(30.1%)	4.1(1.10-6.8)	0.000	3.6(0.19-15.95)	0.06
Secondary education	45(57. %)	34(43. %)	2.4(1.1-4.9)	0.25	1.7(0.53-5.4)	0.4

Table 7: Bivariate and multivariate analysis of disease and treatment related factors with malnutrition among cancer patients in Tikur Anbessa Specialized Hospital, 2019(n=281)

Variable	**Malnutrition**		**COR (95% CI)**	**p-value**	**AOR (CI=95%)**	**p-value**
	Yes	No				
Stage four	59(74.7%0)	20(25.3%)	3.3(1.1-9.8)	.03	7.2(1.3-38.5)	.002*
BMI	92(86. %)	15(14%)	36.8(4.1-33.6)	.001	2.5(0.12-49.8)	0.55
Problem during chewing	38(8.26%)	8(17.4%)	4.11(1.9-9.2)	.001	1.3(0.35-4.7)	0.17
Paine during swallowing	52(85.2%)	9(14.8%)	5.6(2.6-11.6)	.000	0.79(0.23-2.8)	.75
Loss of appetite	156(69.6%)	68(30.4%)	14.1(6.3-31.3)	.000	4.5(1.5-17.2)	.011*
Nausea	149(70.6%)	62(29.4%)	8.8(4.6-16.8)	.000	1.1(0.35-3.4)	0.88
Vomiting	131(78. %)	37(22. %)	8.6(4.10-14.8)	.000	1.6(0.64-3.95)	0.32
Diarrhea	137(82.5%)	29(17.5%)	2.5(1.4-4.5)	.002	7.8(2.10-20.5)	.000*
Wt loss last 3 month	139(71.3%)	56(28.7%)	6.06(3.5-10.6)	.000	1.5(0.68-3.97)	0.25
Decrease feeding habit last weeks	56(73.7%)	20(26.3%)	15.4(8.6-27.7)	.000	0.99(0.39-2.6)	0.99
Fluid<3litters	61(74.4%)	21(25.6%)	4.5(2.2-9.2)	.000	3.1(0.91-10.3)	0.07
Fluid3-5 litters	78(57.8%)	57(42.2%)	2.1(1.2-3.9)	.014	1.8(0.64-4.98)	0.26

6. DISCUSSION

The main purpose of the study was to assess the prevalence of malnutrition and its risk factors among adult cancer patients receiving chemotherapy treatment at Addis Ababa, Tikur Anbessa Specialized Hospital. The overall prevalence of malnutrition among adult cancer patients receiving chemotherapy was 58.4%. This is lower than a study done in, India, Southern Brazil, Seoul National University, Seoul, Republic of Korea, 84.21%, 75.1%, and 61% (8, 11, and 19). This discrepancy might be due to socio demographic characteristics difference, study population, difference in expanded health service provision.

From the current finding prevalence of malnutrition in males was 73% which is higher than Korean study 61% for hospitalized male patients [20] and Tehran male patients 54% [22]. Current finding showed that prevalence in female patient was 91% which was higher than Tehran study which was around 46%[22].

From current result the prevalence of malnutrition was higher in advanced stage of cancer 74.7% which is higher than the Malaysia study 56.9%[18] and Korea with prevalence rate of malnutrition 55.6 % [16].This difference may be due to economic status of the participants and quality of treatment. Stage of cancer was significantly associated with malnutrition. Stage four cancer patients were 7.2 times more likely to have malnutrition than those with stage one [AOR =7.2, 95% CI 1.3-38.51) this was supported by study done in Malaysia (18). It may probably due to poor quality of care cancer related malnutrition or pathophysiology of cancer cells which needs high calorie intake of food in advanced stage.

In addition, those with loss of appetite are 4.5 times more likely to have malnutrition than with no appetite loss (AOR =4.5, 95% CI 1.5-17.2). This study is in line with the study conducted by Kumar on Cancer Patients (13). Study from Italy shows loss of appetite was the major cause of malnutrition in cancer patients[17]. Current study finding shows that loss of appetite (69.6%) which is 4.5 times risk for malnutrition in cancer patient in relation with good appetite patients which is supported by an Indian study in which loss of appetite is the major cause of malnutrition in cancer patients (38.60%) [8]. It may due to cancer therapy affect nutritional status through alterations on the metabolic system, change in tests of food and reduction in food intake result in damage to normal tissues

Further more adult cancer patients with the presence of diarrhea were 7.8 times more likely to have malnutrition than those with no diarrhea (AOR =7.8, 95% CI 2.95-20.5). Study done in , Republic of Korea showed that presence of diarrhea in cancer patients was the major causes of malnutrition in cancer patients [14] which is congruent with current study in which diarrhea was significantly associated with malnutrition of cancer patients. It may due to side effect of chemotherapy or disease itself.

7. Strengths and limitations of the study

7.1. Strengths of the study

- There is high response rate in this study
- The data was collected from two sources: by interviewing patients and from their medical records is the strength of this study
- The study was done in the only oncology center in Ethiopia where patients are coming to this center from all over Ethiopia and hence the result of this study can represent the whole population.

7.2. Limitations of the study

- Shortage of literatures in prevalence and risk factor of malnutrition among adult cancer patients receiving chemotherapy Causal relationships cannot be ascertained as the study used a cross sectional design

8. CONCLUSSION AND RECOMMONDATION

8.1. CONCLUSSION

The prevalence of malnutrition among adult cancer patients receiving chemotherapy was high. Malnutrition was higher among female cancer patients compared to males. The determinant factors that affect malnutrition are: stage of cancer, appetite loss and presence of diarrhea. Early identification of malnutrition status is required for proper nutritional intervention during hospitalization. according to the finding cancer patients, the relationship between subjective symptoms, such as appetite loss and diarrhea, underlines the need for an integrated support team including a psycho-oncologist, who can address and treat psychological aspects (depression, loss of hope, and anxiety) while other team members deal with medical issues.

8.2. RECOMMONDATION

FMOH:

Should give emphasis for expansion of health care centers to all regions, capacitating health care providers working in the care centers and adequate resource allocation

To hospital and health workers

- ✓ Have to take the magnitude of malnutrition and its health implications seriously and initiate and strength activities to reduce malnutrition in cancer patients.
- ✓ Awareness creation of the public on cancer screening and early diagnosis to minimize cancer complications like malnutrition.
- ✓ Training of health professionals about cancer and malnutrition.
- ✓ Establishment of nutritional centers are very important during cancer treatment as treatment modalities themselves are one major causes of malnutrition.
- ✓ Intervention on reduction of chemotherapy related side effects like diarrhea and loss of appétit are significant to decrease cancer related malnutrition
- ✓ Female patients need special attention during cancer treatment due to high prevalence.

Researchers:

Further qualitative and longitudinal studies are needed to explore the state of malnutrition on cancer patients.

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10. ANNEXES

Annex I: Information sheet

Good morning /Good afternoon, my name is……working as data collector in this study.

Dear respondents here are lists of questions with different sections, which are designed for research work to be conducted in partial fulfillment of master Degree in oncology nursing with collaboration of Addis Ababa University School of nursing and midwifery. The main purpose of the study is to investigate the prevalence and risk factors of malnutrition among adult cancer patients after three cycle of chemotherapy treatment in to contribute for the study but you have been selected randomly.. However, you are free to express your discomfort or decide not to participate. This study will help in designing a policy for cancer patients in term of nutritional management. Those who are malnourished will be referred for further investigation and management. Your name will not be recorded and all the information you give will be kept strictly confidential and is to be used only for the purpose of this study.

Annex II: Consent form

this consent form has been read and explained to me and I have understood, and my questions have been addressed. I therefore willingly agree to take part in the study.

1, Yes; continue to the consent form

2, NO; skip to the next participant

Participant signature/ finger print _____

Name of hospital ward_____

Data collector _____ signature _____

Date of screening _____Time started _____time finished _____

Supervisor name _____ signature _____

Annex III: English Questionnaire (English version)

Demographic Information Survey

Part I. From question 001 -007 are designed to assess the patients Socio- demographic characteristics			
S.No	**Question**	**Option Answers**	**Answer**
001	Age in years		
002	Sex	1. Male 2. Female	
003	Residence	1. Urban 2. Rural	
004	What is your region?	1. Oromo 2. Amhara 3. Tigray 4. SNNPR 5. Others (specify) _____	
005	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others(specify)_____	
006	Marital status	1. Married 2. Single 3. Divorced 4. Widowed	
007	Occupation	1. Farmer 2. Merchant 3. Government employee 4. self employee	

		5. Student 6. Other (specify)_____	
008	Monthly average income in Ethiopian birr	**1.** ≤ 500 birr (low income) **2.** 500-1600birr(middle income) **3.** > 1600 (high income)	
009	Educational Status	**1.** No education **2.** Primary education **3.** Secondary education **4.** higher education	
010	How many family members do you have?	_____	
Part II Life style			
101	Have you been experienced Consumption of alcohol?	**1.** Yes **2.** No	
102	Have you been experienced Smoking habits?	1. Yes 2. No	
103	Have you been experienced chewing chat?	1. Yes 2. No	
Part III. Medical and related determinant history of the client.			
201	Family history of cancer	1. Yes 2. No	
202	co morbidity (chronic disease condition other than cancer)	1. Yes 2. No	
203	Types of cancer	----------	
204	Stages of cancer	----------	
205	Types of treatment	1. Chemotherapy 2. Chemotherapy Surgery 3. Chemo- radiation	
206	Route of feeding	1. Solid 2. Semi-solid 3. Liquid 4. Tube feeding	

207	Body weight(Kg)	----------	
208	Height (mts)	----------	
209	BMI= Weight in Kg/height(mts)^2	----------	
210	Do you have any problem during chewing/eating?	1.Yes 2. No	
211	Do you have pain during swallowing?	1.Yes 2. No	
212	Do you bring loss of appetite	1.Yes 2. No	
213	Do you feel nausea?	1.Yes 2. No	
214	Do you have vomiting?	1.Yes 2. No	
215	Do you have diarrhea?	1.Yes 2. No	
216	Do you have constipation?	1.Yes 2. No	
Part IV: Feeding habit			
301	How much do you eat within 24 hours?	1.regular 2.irregular 2.i do not know	
302	Do you have any weight loss in the past 3 months?	1.Yes 2. No	
303	Have you decreased your feeding habit in the last week?	1.Yes 2. No	
304	Have you had regular eating of breakfast habit?	1.Yes	

		2. No	
305	How many times do eat per day?	1.once 2. twice 3.three times 4.four times	
306	Are you in fasting state?	1.Yes 2. No	
307	How much do you take fluid per day?	1.less than 3 litters 2.3-5 litters 3.more than litters	
308	How did you eat?	1.i cannot eat without support 2.parially support by others 3.i can eat without any support	
309	Can you walk?	1.Yes 2. No	

IV: Modified Subjective Global Assessment form

A.1 –Weight change over 6 months 1: Weight gain or No change or Mild weight loss 2:Moderate weight loss 3:Severe weight loss	**B.1 – Subcutaneous loss of fat** 1: Little or no loss 2: Mild-moderate in all areas; severe loss in some area 3: Severe loss in most areas
A.2 – Weight change in past 2 weeks 1: Weight is increasing 2: No change in weight 3: Weight is decreasing	**B.2 – Muscle thinning** 1: Little or no loss 2: Mild to moderate in all areas; severe loss in some areas 3: Severe loss in most areas
A.3 – Change in dietary intake 1: No change or slight change for short duration 2: Intake borderline and decreasing; Intake poor and increasing; Intake poor, no change based on prior intake	**B.3 – Edema** 1: Little or no edema 2: Mild to moderate edema 3: Severe edema

3: Intake poor and decreasing	
A.4 – Duration and degree of change 1: Less than 2 weeks, little or no change 2: More than 2 weeks, mild to moderate suboptimal diet 3: Unable to eat or starvation	**B.4 – Ascites** 1: No ascites or only on imaging 2: Mild to moderate ascites or improving clinically 3: Severe ascites or progressive ascites
A.5 – Presence of GI symptoms 1: Few or no symptoms intermittently 2: Some symptoms for >2 weeks; severe symptoms that are improving 3: Symptoms daily or frequently >2 weeks	
A.6 –Functional status 1: No impairment in strength, stamina and full functional capacity; mild-moderate loss and improving **2**: Mild to moderate loss of strength, stamina some loss of daily activity or severe loss but now improving **3**: Severe loss of function, stamina and strength	
A.7 – Disease state and co-morbidity **1**: No stress **2:** Low or moderate stress **3:** High stress	

How to finalize the SGA score

SGA is truly a subjective means of assessing the nutritional status. SGA classifies the patient as: A. Well-nourished; B. Moderately malnourished; C. Severely malnourished. Patients are placed into one of these categories based on their subjective rating in two broad areas: The items on the form are used by the nutritionist to obtain a general feel for the patient's status. If there are more B or C ratings, the patient is more likely to be malnourished or so (B+C) classified as malnutrition and score A was well nutrition. If the ratings are on the left-hand side, the patient is likely to be well nourished. For more details [21]. Similarly SGA was classified in this data (B+C) Malnourished (moderate and severe): $\geq$ 17 points. Well-nourished: < 17 points.

Annex V. Subject information sheet (Amharic Version)

አዲስ አበባ ዩንቨርሲቲ የድህረ-ምረቃ ትምርት ቤት ጤና ህክምና ሳይንስ ኮልጀ የነርሲንግ ክፍል።

ሀ. የጥናቱ መረጃ፡- ጤና ይስጥልኝ፤እንደምንአደሩ፤ እንደምንዋሉ---

ጤና ይስጥልኝ፡፡ ስሜ----------ይባላል፡፡የጤና ባለሙያ ነኝ በአዲስ አበባ ዩኒቨርሲቲ ህክምና የጤና ሳይንስ ኮላጅ የሁለተኛ አመት የማስተር ተማሪ ነኝ በአሁን እዚህ የተገኘሁት ጥናቱ ዋና ዓላማ ለሶስት ዙር የኬሞቴራፒ ህክምና ከተደረገ በኋላ በየአመቱ ለካንሰር ነቀርሳ ህመምተኞች እና ለተመጣጣኝ ምግቦች የተመጣጠነ ምግብ ማጣት ዋነኛ ምክንያቶችን ለመፈተሽ ነው ለማጥናት የተዘጋጀ ቃለመጠይቃዊ መረጃ ለመሰብሰብ ነዉ፡፡ ይህ ጥያቄ የተዘጋጀው ለምርምር ስራ ሲሆን በአዲስ አበባ ዩኒቨርስቲ በጥናትና ምርምር ኮሚቴ ተገምግሞ እንደ አስፈሊጊነቱ ግድፈት ካለበት እርማት ይደረግበታል፡፡በዚህ ጥናት በመሳተፍዎ የሚያገኙት ቀጥተኛ የሆነ ጥቅም የለም ቢሆንም ከዚህ ጥናት የሚገኘዉ ዉጤት በቀጥታ ማህበረሰቡን የሚጠቅም ሲሆን ለእርስዎ ደግሞ እርካታን እንደሚሰጥዎት ተስፋ አደርጋለሁ፡፡ ለዚህ ቃለመጠይቅ የተመረጡት ጥናቱ በሚካሂድበት ወቅት በመገኘትዎ ነዉ፡፡ ከጥናቱ የሚገኘዉ መረጃ ከላይ ከተጠቀሰዉ ዓላማ ዉጭ አላማ ተግባር የማይዉል ሲሆን መረጃዉ በሙሉ በሚስጥር የሚጠበቅ መሆኑን ቃል እየገባሁ ለወደፊቱም ለሚፈልጉት የጤና አገልግልት በአርስዎም ሆነ በቤተሰብዎ ላይ ምንም ዓይነት ተጽእኖ እንደሌለው ልገልፅልዎት እወዳለሁ፡፡

Annex VI. Consent sheet (Amharic Version)

የፈቃደኝነት ማረጋገጫ ቅጽ

ከላይ የጥናቱ አላማ፣ ጥቅሙ ፣ ጉዳቱ፣ እንዲሁም ሚስጥራዊነቱ በሚገባኝ እና በምረዳው ቋንቋ ተገለፆልኛል፡፡ በጥናቱ ላይ ያለመሳተፍም ሆነ ከጀመርኩ በኋላ በፈለኩት ጊዜ አቋርጬ የመዉጽ ሙሉ መብት አለኝ፡፡

በዚህ ጥናት ላይ ተሳትፎዬ ፈፅሞ በፍላጐት ላይ የተመሰረተ ነው

በዚህ ጥናት ላይ ለመሳተፍ ፍቃደኛ ንዎት?

1. አይደለሁም (አመሰግናለሁ) 2. አዎ (እንቀጥል)

ፊርማ ---------- ቀን ----------

የጥናት አድራጊዋ ስም፡- ጥዑማይ ኪሮስ

ስልክ ቁጥር፡- **+251914696717**

ኢ-ሚይል፡- **tumaygebre57@gmail.com**

የጠያቂው ስም …….. ፊርማ ……

የተጠየቀበት ቀን ……/……/……

የጥናቱ ውጤት: 1. ተጠናቋል 2. መጠየቅ አልፈለጉም

3. በከፊል ተጠናቀቀ 4. ተጠያቂው አልተገኙም

በተቆጣጣሪ ተረጋግጧል ስም …… ፊርማ …… ቀን …….

Annex VII: Amharic version structured questionnaires

ክፍል አንድ - ማህበራዊ ና ግላዊ መረጃ			
ተ.ቁ	ጥያቄ	መልስ	ማሳለፉያ
001	ዕድሜ በ አመት	----------	
002	ጾታ	1/ወንድ 2/ ሴት	
003	የሚኖሩበት ክልል የት ነው?	1/ ኦሮሚያ 2/ አማራ 3/ ትግራይ 4/ ደቡብ 5/ ልላ_____	
004	ሃይማኖትዎ ምንድ ነው?	1/ ኦርቶዶክስ 2/ እስልምና 3/ ፕሮቴስታንት 4/ ካቶሉክ 5/ ልላ_____	
005	የጋብቻ ሁኔታ?	1/ ያላገባች 2/ ያገባች 3/ በሞት የተለያየች	

		4/ በፍች የተለያየች 5/ ሌሎች_____	
006	የሥራ ሁኔታ	1/ ገበር 2/ ነጋዴ 3/ የመንግሥት ሠራተኛ 4/ የግል ሰራተኛ 5/ ተማሪ 6/ ሌላ ካላ ይጥቀሱ----------	
007	የቤተሰብዎ የወር ገቢ ምን ያህል ነው?	1/ ዝቅተኛ(ከ 500 ብር በታች) 2/ መካከለኛ(500-1000 ብር) 3/ ከፍተኛ(ከ1000 ብር በላይ)	
008	የትምህርት ከፍተኛው ደረጃ ስንት ነው?	1/ መጻፍና ማንበብ የማትችል 2/ የመጀመሪያ ደረጃ ትምህርት 3/ ሁለተኛ ደረጃ ትምህርት 4/ የሁለተኛ ደረጃ ከዛ በላይ	
009	ምን ያህል የቤተሰብ አባላት አሉዎት?	_____	
ክፍል 2 የህይወት ዘይቤ			
101	የአልኮል ይጠጣሉ ወይ?	1/ አዎ 2/ የለም	
102	ሲጋራ አጭሶ ያውቃሉ ወይ ?	1/ አዎ 2/ የለም	
103	ጫት ይቅማሉ ወይ?	1/ አዎ 2/ የለም	
ክፍል 3 :የደንበኛው የሕክምና እና ተዛማጅ ወሳኝ ታሪክ			
201	በቤተሰብ ውስጥእንደዚ ዓይነት ህመም	1/ አዎ	

	ያጋጠመው አለ ወይ?	2/ የለም	
202	ከዚ ህመም ውጪ ለላ ህመም አለቦት ወይ?	1/ አዎ 2/ የለም	
203	የካንሰር ዓይነቶች	----------	
204	የካንሰር ደረጃዎች	----------	
205	የሕክምና ዓይነቶች	1/ ምንም ዓይነት ህክምና የለም 2/ ኪሞቴራፒ 3/ ሬዲዮቴራፒ 4/ ኪሞቴራፒ-ሬዲዮቴራፒ 5/ ቀዶ ጥገና 6/ ሌሎች_____	
206	የሚመገቡት የምግብ ዓይነት ?	1/ ጠንካራ 2/ ከፊል-ጠንካራ 3/ ፈሳሽ 4/ በህክምና እገዛ ሚሰጡት ምግብ	
207	የክብደት (ኪግ)	----------	
208	ቁመት (ሚትር)	----------	
209	የሰውነት ኢንዴክስ ክብደት እና **(mts)^2**	----------	
205	ሌላ ህመም አለብዎት?	1/ አዎ 2/ የለም	
209	የማኘክ / የመብላት ችግር አለብዎት?	1/ አዎ 2/የለም	
210	በሚውጥበት ወቅት ህመም ይሰማዎታል?	1/ አዎ 2/የለም	
211	የምግብ ፍላጎት እያጡ ነው?	1/ አዎ 2/የለም	
212	ማቅለሽለሽ አለብዎት?	1/ አዎ 2/የለም	
213	ትውከት አለብዎት?	1/ አዎ 2/የለም	
214	ተቅማጥ አለብዎት?	1/ አዎ	

		2/ የለም	
215	የሆድ ድርቀት አለዎት?	1/ አዎ 2/ የለም	
ክፍል 4፡ የምግብ እጥረት			
301	በ 24 ሰዓቶች ውስጥ ምን ያክል ይመግባሉ?	1/ መደበኛ 2/ ያልተስተካከለ 3/ አላውቅም	
302	ባለፉት 3 ወራት ውስጥ ክብደትን ቀንሰዋል?	1/ አዎ 2/ የለም	
303	ባለፈው ሳምንት የአመጋገብ ስርኣትን ቀንሰዋል**?**	1/ አዎ 2/ የለም	
304	ቁርስዎን የመመገብ ልማድ አለዎት?	1/ አዎ 2/ የለም	
305	በቀን ስንት ጊዜ ምግብ እየበሉ ነው?	1/ አንድ 2/ ሁለት 3/ ሶስት 4/ አራት	
306	ትጾማለህ ?	1/ አዎ 2/ የለም	መልስዎ አይደለም ከሆነ ወደ ጥያቄ **308**
307	በዓመት ስንት ጊዜ ይጾማሉ ?	1/ አንዴ 2/ ሁለት ግዜ 3/ ሦስት ጊዜ 4/ ከሶስት በልይ	
308	በቀን ውስጥ ምን ያህል ፈሳሽ ይጠቀማሉ?	1/ከ 3 ኩባያዎች ያነሱ 2/ ከ 2.3 እስከ 5 ኩባያዎች 3/ከ 5 በላይ ኩባያዎች በልይ	

309	የመመገብ ችሎታ	1/ያለ እርዳታ ሊበሉ አይችሉም 2/ በተወሰነ ችግር እራሱን በራሱ መመገብ ያለ 3/ምንም ችግር በራሱ የሚመግበው	
310	መራመድ ይችልሉ	1/ አዎ 2/የለም	
311	ረዳት ያስፈልገዋል	1/ አዎ 2/የለም	

አባሪ 4 : የተሻሻለው የፕሮጀክት አለም አቀፍ ግምገማ ቅጽ

***ሀ* -1 - በ 6 ወር ወስጥ የክብደት ለወጥ** አለ? 1. ክብደት መጨመር ፣ክብደት ለውጥ የለም ወይም አነስተኛ ክብደት መቀነስ 2. ፣መካከለኛ ክብደት መቀነስ 3. ከባድ ክብደት መቀነ	**ለ.1 - በከፊል የደም ቅባት** 1. ትንሽ ወይንም ምንም አለቀነሰኩም 2. በሁሉም ቦታዎች አነስተኛ እስከ መካከለኛ ዉይም የተወሰነ ሰዉነት ላይ ወፍረት በጣም ቀንሻያለው 3. አብዛኛዉ ሰዉነት በጣም ቀንሻያለው
***ሀ*.2 - ባለፉት ሁለት ሳምንት የክብደት መለወጥ** አለ ? 1.ክብደት እየጨመረ ነዉ 2.ክብደት ምንም ለውጥ የለም 3. ክብደት እየቀነሰ ነው	**ለ.2 - የጡንቻን መቀነስ**: 1.ትንሽ ወይንም ምንም አልቀነሰኩም 2. አነስተኛ እስከ መካከለኛ በ ሁሉም ሰዉነት ላይ ወይም የተወሰነ ሰዉነት ላይ ወፍረት በጣም ቀንሻያለው 3. አብዛኛዉ ሰዉነት እጅግ በጣም ቀንሻያለው
***ሀ*.3 - የአመጋገብ ለውጥ** አለ ? **1.** ምንም ለውጥ የለም ወይም ትንሽ ለውጥ አለ በ አጭር ግዘ ዉስጥ 2. መውሰድ ቀነሰ ወየም ከዎትሮ መቀነስ 3. ደካማ አዎሳሰዲና የቀነሰ	**ለ.3 - አብጠት** 1. ትንሽ ወይንም ምንም አብጠት የለም 2.አነስተኛ እስከ መካከለኛ 3. ከፍተኛ አብጠት
***ሀ*.4 - የጊዜ ርዝመት እና የለውጥ ደረጃ** 1. ከ 2 ሳምንታት ያነሰ, ትንሽ ወይም **ለውጥ** የለም	**ለ.4 - ሙሉ የሰዉነት እብጠት** 1.ምንም አብጠት የለም ወይም አንድ ቦታ ላይ

2. ከ 2 ሳምንታት በላይ, አነስተኛ እስከ መካከለኛ ተመጣጣኝ አመጋገብ 3. አለ መብላት ወይም ረሃብ	ብቻ ይታያል 2.አነስተኛ እስከ መካከለኛ ሙሉ የሰዉነት እብጠት ይታያል 3..ከፍተኛ ወይም ተከታታይ የሰዉነት እብጠት ይታያል
ሀ.5 - የጂ.አይ. ምልክቶች መኖሩ 1. ጥቂት ምልክቶች ወይም የማያቋርጥ ምልክቶች 2. አንዳንድ ምልክቶች ከ 2 ሳምንታት በላይ እየተሻሻሉ ያሉ ከባድ ምልክቶች 3. በየቀኑ ምልክቶች ወይም በተደጋጋሚ ከ 2 ሳምንታት በላይ,	
ሀ.6 - ከተለመዳዉ ተግባራት የተለየ ተጽዕኖ **አለ?** 1. መንም ተጽዕኖ የለም፣ 2. አነስተኛ እስከ መካከለኛ ጥንካሬ ማጣትና አልፎ አልፎ የእለተ እለት ተግባራትን ማቆም ነበሬ አሁን ግን ደሀና ነኝ 3. የእለተ እለት ተግባራትን ሙሉ በ ሙሉ ማከናወን አልችልም	
ሀ.7 -በ ህመም ምክንያት ይጨናነቃሉ 1. አልጨናነቅም 2. ትንሽ 3. በጣም	

የSGA ውጤት እንዴት ማጠናቀቅ እንደሚቻል:

SGA በእርግጥ በተጨባጭ ሁኔታ የአመጋገብ ሁኔታን ለመገምገም ሰውነት ነው. SGA ታካሚውን እንደሚከተለው ይመድባል-ሀ. የተመጣጠነ ምግብ; የተመጣጠነ የተመጣጠነ ምግብ እጦት; ሐ. የተመጣጠነ ምግብ እጦት. ታካሚዎች በሁለት ሰፋፊ መስፈርቶች ላይ በመመርኮዝ ከነዚህ ምድቦች ውስጥ ወደ አንዱ ይያዛሉ. ሀ. የህክምና ታሪክ; ለ. አካላዊ ምርመራ. ሐኪሙ እያንዳንዱ የጤንነት ታሪክ እና የአካል ምርመራ ውጤት እንደ የ A, B ወይም C በ SGA ውጤት ኮርፊኬሽን መስፈርት መሠረት ይወስናል. የመመዘኛዎች እንደ መመሪያ, አጠቃላይ የ SGA ውጤት ይሰጣሉ, እሱም በበሽተኛው የአመጋገብ ሁኔታ ላይ ካለው አስተያየት ጋር የሚሄድ. SGA የቁጥር ውጤት መመዘኛ ዘዴ አይደለም. ስለዚህ አጠቃላይ የ SGA ምደባ ላይ ለመድረስ የ A, B እና C ደረጃዎችን ማመከል ወይም ማከል ተገቢ አይደለም. በቅጹ ላይ ያለው ንጥረ ነገር ለህመምተኛ ሁኔታ አጠቃላይ ስሜትን ለማግኘት በህልሙ ባለሙያው ጥቅም ላይ ይውላል. ተጨማሪ የ B ወይም የ C ደረጃዎች ካሉ ህመምተኛው የተመጣጠነ ምግብ እጦት የመጨመር ዕድል አለው. ደረጃዎቹ በግራ በኩል ከሆኑ, ታካሚው በደንብ ሊመገብ ይችላል. ለተጨማሪ ዝርዝሮች [19].