THE EFFECT OF MALNUTRITION AT ADMISSION ON LENGTH OF HOSPITAL STAY AMONG ADULT PATIENTS IN ADAMA HOSPITAL MEDICAL COLLEGE, ADAMA, CENTRAL ETHIOPIA: PROSPECTIVE COHORT STUDY

MPH THESIS

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ACRONYMS AND ABBREVIATIONS

AHMC Adama Hospital Medical College

CCI Charlson comorbidity index

DRG diagnosis related group

GI gastro intestine

HR Hazard Ratio

HU Haramaya university

IR Incidence rate

IRQ inter quartile range

IHRERC Institutional Health Research Review Committee

LOS Length of Stay

SGA subjective global assessment

WHO world health organization

ABSTRACT

Background: Malnutrition is a widespread problem both at community and hospital settings. In hospital setting, it is prevalent with the range of 20-50% of patients being found malnourished at admission. Poor nutritional status is highly associated with range of functional, clinical, and economic outcomes.

Objective: The general objective is to determine the effect of malnutrition at admission on length of hospital stay in adult patients in Adama Hospital Medical College starting from June 15 to July 30, 2024..

Methods and Materials: An institution based prospective cohort study was conducted among 401 adult hospitalized patients (217 exposed and 184 unexposed) at Adama Hospital and Medical College on eligible subjects who were admitted to the selected wards during the study period. The nutritional status of the subject was recorded within 24 hr. of admission using the subjective global assessment tool. Length of stay was recorded in days for every subject from the day of admission to discharge. Data was cleaned, checked, coded and entered using Epi data version 3.1 and all statistical tests were done using STATA version 17.0. Descriptive statistics was used to describe the characteristics of study participants. Cox proportional-hazard model was fitted to verify the effect of malnutrition on length of stay; both crude and adjusted hazard ratios with 95% confidence intervals were estimated to show the strength and direction of associations. Statistical significance was considered at p value less than 0.05.

Result: - Using Subjective Global Assessment (SGA), the magnitude of malnutrition was 54% with 95% CI (49.1%, 58.9%), The mean ($\pm$SD) length of stay was 9 (±1 days). Severely malnourished patients were found staying longer in the hospital with mean length of stay of 16±2 days and well-nourished patients were found staying the shortest period of time with mean length of stay of 5±0.5 days. The final multivariate model which was controlled for the other factors showed that nutritional status independently affects LOS, SGA-B (AHR=0.23, 95% CI 0.13, 0.40) and SGA-C (AHR, 0.09; 95% CI 0.03, 0.23).

Conclusion: - The study showed that malnutrition was highly prevalent among hospitalized adult patients. Severely Malnourished patients needed longer hospitalization period compared to well

nourished and moderately malnourished patients. This study also showed that patients who had history of previous admission stayed longer in the hospital.

Recommendation :- Hospitals should integrate Nutritional screening and assessment tool in their care packages for all patients admitted to hospital. Clinicians need to be aware of the impact of malnutrition and of the potential role of worsening nutritional Status in prolonging hospital stay.

Keyword: - Malnutrition at admission, length of stay**,** adult malnutrition

1 INTRODUCTION

1.1 Background

Malnutrition refers to deficiencies or excesses in nutrient intake, imbalance of essential nutrients or impaired nutrient utilization. The double burden of malnutrition consists of both under nutrition and overweight and obesity, as well as diet-related non-communicable diseases. Under nutrition manifests in four broad forms: wasting (Low weight for height) indicates recent and severe weight loss, stunting (low height for age) indicates chronic or recurrent under nutrition, underweight (low weight for age) might be wasted or stunted or both, micronutrient deficiency it is deficiency of vitamins and minerals essential for the body (WHO,2022).

Malnutrition is a widespread problem both at community and hospital settings. In hospital setting, it is prevalent with the range of 20-60% of patients being found malnourished at admission {Nigatu et al.,2021}. Even though the term malnutrition consists of both under nutrition and over nutrition, most literatures used it interchangeably with under nutrition since it is the commonest one in developing countries. Poor nutritional status is highly associated with range of functional, clinical, economic disruptions. These outcomes are more serious and common on people being hospitalized since hospitalized patients are vulnerable to malnutrition due to various reasons such as lesser knowledge of patient about nutritional status, the disease itself, economic incompetence, lack of knowledge and negligence of health professionals, some medicines and therapeutic procedures affect nutritional status of the patient and mostly there is a gap in routine nutritional assessment and intervention in health facility.(Badosa et al., 2017; Nigatu et al., 2021) Malnutrition at admission is associated with detrimental outcomes like prolonged length of stay, complication, readmission, and mortality. (Chima et al., 1997;Correia and Waitsberg 2003)

Poor nutritional status at hospital admission can result in prolonged hospital stay. Prolonged Length of hospital stay may be caused due to multiple reasons such as development of complication, risk of infection during stay, poor or delayed prognosis, developing pressure ulcer and slowed wound healing, nutrient absorption and utilization difficulties, changes in thermoregulation and alteration in renal function (Lim et al., 2012)

Decreasing length of hospital stay is of a significant advantage for hospitals, patients and society in general. Because the longer patients stay in hospital it hinders accessibility of the health care service, and might cause shortage of beds and increase cost of hospitalization. So, hospitals and the health care system should prioritize promoting short and brief hospital stay and rapid recovery. In order to achieve this, poor nutritional status should be taken in to account as it might be one of the determining factors (Allard et al., 2016)

Routine nutritional screening and assessment starting from within 24 hour of admission and throughout their stay is one of the strategies being used by hospitals to prevent and manage hospital malnutrition (Rasmussen et al., 2010). Furthermore, nutritional intervention is recommended for patients identified as at risk of malnutrition. Even though malnutrition in adult patients is highly prevalent in Ethiopia, more emphasis is given to childhood malnutrition so there is significant lack of knowledge about adult malnutrition among the health professionals as well as the society that is why the routine nutritional screening and assessment is not being done in all hospitals uniformly as part of the medical care. (McWhirter and Pennington 1994). So, more emphasis needs to be given for the issue in order to decrease LOS, hospital cost and associated effects of malnutrition.

1.2 Statement of the problem

The prevalence of malnutrition at admission across continents is documented to be between 15%-70% (Cawood et al., 2010). There are multiple factors which are contributing to this range of variation like patient population, definition and criteria used for classification and the study area. In Africa there is limited information about the prevalence of hospital malnutrition in adults but a cohort study done in multiple institutions in 3 countries (Kenya , South Africa ,Ghana)found prevalence of 72% with the highest prevalence in Kenya and Ghana with 74% prevalence and South Africa the lowest with 68%(Blaauw et al., 2019) Despite the data on prevalence of malnutrition at admission in Ethiopia being extremely limited it is not hard to predict it is most likely highly prevalent. A study done in Amhara regional state involving 4 referral hospitals the prevalence of malnutrition was found to be 55.6%(Tesfaye et al., 2015).A recent study conducted in TikurAnbessa specialized hospital in Ethiopia found the prevalence of malnutrition at hospitalization to be 62.1%(Nigatu et al., 2021).

Some of this study have tried to assess the relationship between nutritional status and length of hospital stay. And few have tried to compare the average length of stay of patients at risk of malnutrition and those who are not at risk of malnutrition at admission and the results indicated that patients that were at risk of malnutrition at admission had longer stay at the hospital than those who were well nourished at admission average length of stay of patients at risk of malnutrition was found to be 40%-70% longer even increasing around 5 fold in severely malnourished patients(Kyle et al., 2005; Ockenga et al., 2005; Kyle et al., 2006; Nigatu et al., 2021) .this increased length of stay can contribute to many related factors such as cost of hospitalization and risk of hospital acquired conditions A study that have tried to calculate the additional cost of health service caused by the prolonged hospital stay recorded that the cost of hospitalization of malnourished patients is significantly higher than that of non-malnourished ones the mean difference in the cost being 1409€ and the highest recorded amount being 5829€(Álvarez-Hernández, et al., 2012).We can imagine how much of a burden this could be in a country like ours with high burden of malnourished people.

Other than cost of hospitalization malnutrition is a huge burden to the health system specially in a developing country like ours already struggling from economic and human resource scarcity it hinders patient flow and health service accessibility which as a result might compromise the

quality of treatment and timely recovery of patients. This study will show the prevalence and effect of malnutrition on length of hospital stay in regional hospital in Ethiopia which is not done previously

1.3 Significance of the study

Determining prolonged hospital stay caused by malnutrition is important since it helps the accessibility and effectiveness of the health system. facilities will have the information and will be able to allocate resources where it is needed, develop proper health care plan and focus and put up proper supervision on patient's nutritional status assessment, intervention and proper referral system both at admission and stay at the hospital this will reduce the economic and human cost of malnutrition

The result from this study could also help facilities and health professionals give emphasis to nutritional status of patients and give as equal importance to managing mal nutrition alongside there morbidity .It might give impression for hospitals to have proper nutrition care plan and nutrition professionals to help reduce the waste and inconvenience caused by malnutrition in health facilities

1.4 Objective

1.4.1General objective

The general objective is to determine the magnitude and effect of malnutrition at admission on length of hospital stay in adult patients in Adama Hospital Medical College starting from June,15,2024 to July 30,2024

1.4.2specific objective

1, To assess the magnitude of hospital malnutrition at the time of admission among hospitalized adult patients

2, To evaluate the effect of malnutrition at the time of admission on length of hospital stay among hospitalized adult patients

2, LITERATURE REVIEW

2.1 Prevalence of malnutrition at admission

Regardless of significant measures being taken to prevent, identify and manage the problem malnutrition still remains one of the biggest concerns of the health system. Prevalence of malnutrition at admission varies in different population depending on factors like sociodemographic characteristics, educational status, health care coverage, type and severity of main diagnosis, and type of nutritional screening method used. (Nyatefe, 2017)

A global prevalence of malnutrition at admission ranging from 20%-60% has been observed which puts 30%-55% of all patients being at risk of malnutrition at admission. A study done in two metropolitan teaching hospitals in Australia average malnutrition rate was observed to be 36%.(Nyatefe 2017).Another study done at Southampton general hospital in united kingdom on one hundred ninety four outpatients between July2008 and June2009 identified 16%-21% patient are at risk of malnutrition(Cawood et al., 2010) in north America and America and Europe there is nutritional risk in 20-60% of hospitalized patients (Schütz et al., 2006; Ljungqvist et al., 2010). And a study that was done on 13 hospitals in Germany showed a prevalence of 27.4%(Nyatefe 2017).A systematic review conducted on articles about disease related malnutrition among 12 Latin American countries on papers published between January 1995 and September 2014 shows, the prevalence was consistently in the range of 40%-60% at the time of admission, with several studies reporting an increase in prevalence with increasing duration of hospitalization,(Correia and Waitzberg 2003; Nigatu et al. 2021)

In Africa there are limited evidences on the report of hospital malnutrition despite the evidence being few it shows evidently how serious the issue is and how it is by far worse in African countries. And out of all African countries south Africa had the highest prevalence with 72.8% and Ghana had the lowest prevalence of malnutrition among hospitalized patients with 6% (Nyatefe 2017)

In Ethiopia the prevalence of hospital malnutrition was found to be 55.6% in a cross sectional study done on 403 adult patients admitted to Amhara national regional state referral hospitals (Tesfaye et al., 2015) .Another prospective cohort study done on 417 adult patients admitted to

Tikuranbessa specialized hospital recorded a magnitude of hospital malnutrition being 62.1 %((Nigatu et al. 2021)

The above evidences show how much of a common problem malnutrition is in hospital settings. The prevalence is higher in developing countries compared to the developed ones, this might be because of reasons like poor health care coverage and socioeconomic status of the population.

2.2 malnutrition and length of stay

poor nutritional status has been associated with longer length of stay (LOS) and treatment durations LOS has been used as a surrogate marker of patients' well-being during hospital treatment and is considered to reflect integration of the severity of illness and the patient's health status affected by genetics, the extent or severity of the trauma or disease, the overall medical or surgical treatment and the quality of care. Reducing the LOS, therefore, has the potential to decrease health care costs, the risk of infections, and other hospital-acquired diseases and to improve patients' quality of life (Gupta et al., 2011).

Studies have tried to assess the effect of malnutrition on patient outcomes including LOS. Malnourished patients were found to stay in hospitals 1.5-1.7 times longer compared to wellnourished patients (Middleton et al., 2001; Correia et al., 2017). A cross-sectional study conducted among hospitalized patients in Korea different centers concluded that LOS was shorter in well-nourished patients (7.63 ± 6.03 days) compared to moderately mal nourished (12.18 ± 7.24 days) and severely malnourished (9.02 ± 9.96 days) patients(Kang, Kim et al. 2018) a study done in brazil among adult hospitalized patients also concluded malnourished patients tend to stay longer in hospital with median of 9 days compared to adequately nourished patient with median 0f 6days (Correia et al., 2017) a prospective cohort study conducted in 18 Canadian hospitals showed malnutrition at admission was independently associated to prolonged hospital stay (hazard ratio, 0.73; 95% CI, 0.62–0.86).(Allard et al., 2016) a study done in Saudi Arabia also showed increased length of stay in malnourished patients compared to well-nourished ones (IQR, 5-11 days; median = 7 days)(Alzahrani and Alamri 2017)

Despite limited research's done in Africa the results are compatible with the other world a study done in Ghana implied patients at risk of malnutrition had prolonged LOS (9.7 days) compared to adequately nourished patients (5.9 days)(Nyatefe 2017).another study done in south Africa showed mean LOS of 6.9 days ±5.9SD and LOS in malnourished patients was longer (7.4 days ±6.1SD) compared with well-nourished patients (5.2 days ±4.8SD**)** a study done in Ethiopia

Tikuranbesa specialized hospital showed that patients classified as well-nourished tends to stay shorter period of time in hospital compared to malnourished ones(8.3±4.9 days Vs 17.2± 6.8days, $p < 0.001$)(Nigatu et al., 2021)

The similarity of the results of the above studies which are done in different population and clinical settings using different nutritional assessing tool is a huge indicator that hospital malnutrition has significant effect on LOS.

CONCEPTUAL FRAMEWORK

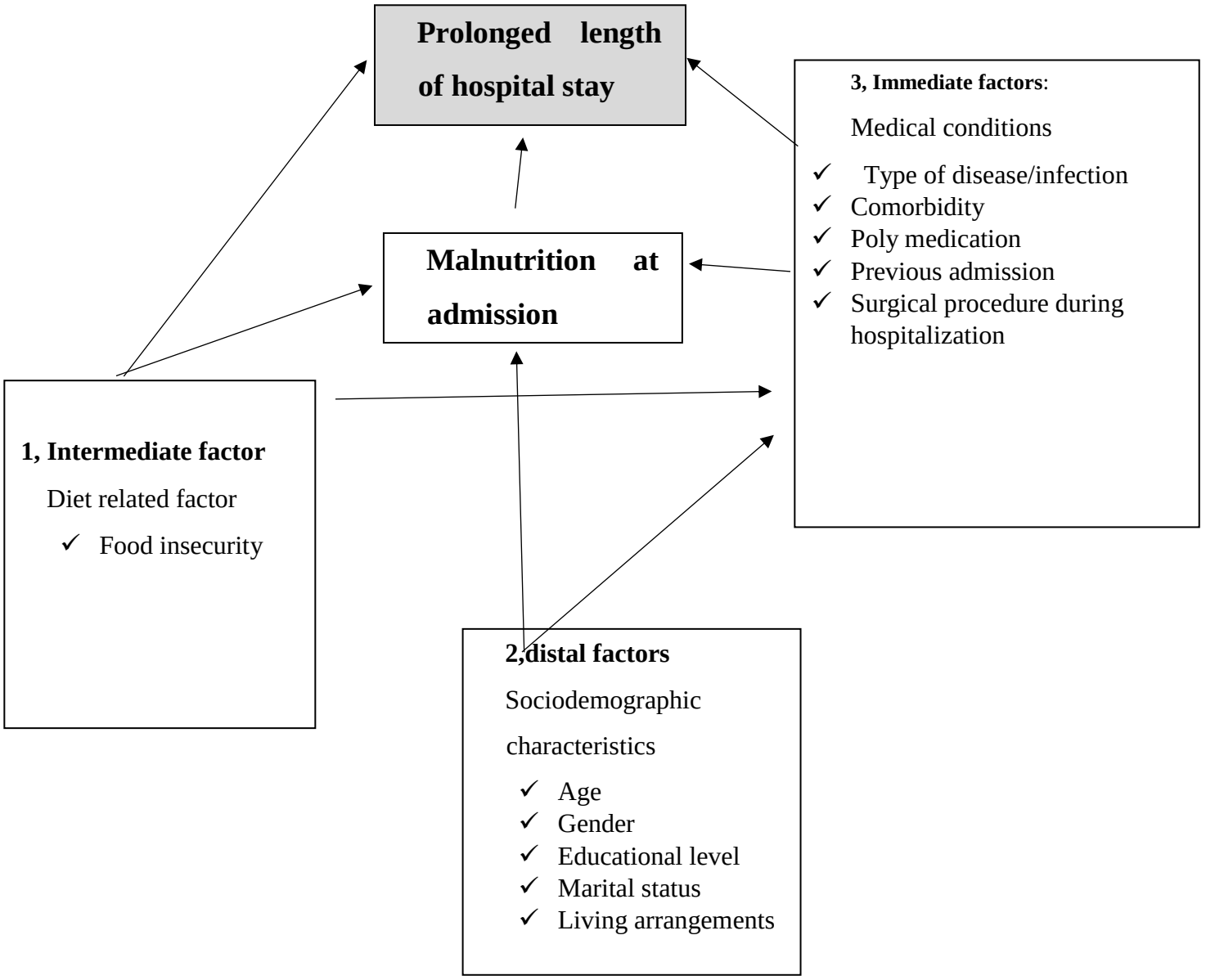

Figure 1:CONCEPTUAL FRAME WORK ON THE EFFECT OF MALNUTRITION AT ADMISSION ON HOSPITAL LENGTH OF STAY AMONG ADULT HOSPITALIZED PATIENTS IN ADAMA HOSPITAL AND MEDICAL COLLEGE, 2024 (CONSTRUCTED BY THE PRINCIPAL INVESTIGATOR THEREBY REVIEWING DIFFERENT LITERATURES)

3, METHODS AND MATERIALS

3.1 Study area and period

The study was conducted at Adama Hospital Medical College which is one of the first medical hospital in Adama town located in Oromia region 100 km, from the capital of Ethiopia addisababa. the hospital was previously known as Hayilemariam Mamo memorial Hospital. it was inaugurated by missionaries from abroad in 1938 E.C. It was upgraded to medical college in 2003 E.C because of its location, patient load and staff capacity. The hospital is serving a catchment population of more than 6 million from five regions (Oromia, Amhara,Afar,Somali,and Dire dawa). The hospital has 232 beds capacity and serving on average 1000 patients /day at six medical case teams and different specialty clinics. Service delivery is organized in to different departments the major ones being internal medicine, surgical, obstetrics and gynecology, and pediatrics department (AHMC, 2024)

The study was conducted from June 15 to July 30, 2024.

3.2 Study design

A prospective cohort study design was used on adult patients admitted to AHMC

3.3 Population

3.3.1 Source population

All adult (>=18) patients admitted to the medical surgical and the minor wards of AHMC

3.3.2 Study population

The study population were adult hospitalized patients who were admitted to the two major wards surgical and medical wards as well as the minor wards (orthopedics, oncology, ophthalmology and plastic surgery) during the study period and fulfill the inclusion criteria.

3.4 Inclusion and exclusion criteria

3.4.1 Inclusion criteria

Patients whose ages was greater than 18 years and patients admitted to the surgical and medical as well as the minor wards during the study period were included in the study

3.4.2 Exclusion criteria

Clinically unstable, comatose, bed ridden patients who were unable to be weighed standing, mental health patients, obstetric patients and patients on chemo therapy were excluded

3.5 Sample size determination

For the first objective

To assess the magnitude of hospital malnutrition at the time of admission among hospitalized adult patients

The sample size was determined using single population proportion formula

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

Z(standard normal distribution) with C.I of 95% and (a=0.05)=1.96

P (expected prevalence of hospital malnutrition) = 0.556 (Haile et al, 2015[i])

d (Absolute precision or tolerable marginal error) =0.05

Non-response rate=10%

n=417

For the second objective

The sample size was calculated using double population proportion formula, by using epi info

$$n = \frac{[z\,\alpha/2\,\sqrt{(1+1/r) + z\beta\sqrt{p1\,(1-p1) + p2\,(1-p2)/r}}]^2}{(p1 - p2)^2}$$

The following assumptions is made

α- 0.05 (1.96)

β- 20%

P1 (Proportion of prolonged length of hospital stay among malnourished patients) =37.2% (Caccialanza, 2010)

P2 (Proportion of prolonged length of hospital stay among well-nourished patients =14.1% (Caccialanza, 2010)

r =1 β=20% α =0.05 Non-response rate =10%

n=140

Since the sample size calculated for the first objective using single population proportion formula yield the largest sample size which is 417, it was taken as the final sample size.

3.6 Sampling procedure

First, a list of wards of AHMC in line with the inclusion criteria will be obtained. Required sample size will be obtained from the two major eligible wards (medicine and surgery) plus four minor wards (orthopedics, oncology, ophthalmology and plastic surgery) wards. Then the sample size of the study will be allocated to the wards proportionally to their patient sizes. This helps to ensure that a representative sample is obtained from each ward. The recruitment of the study participants will continue consecutively until the required sample size is reached.

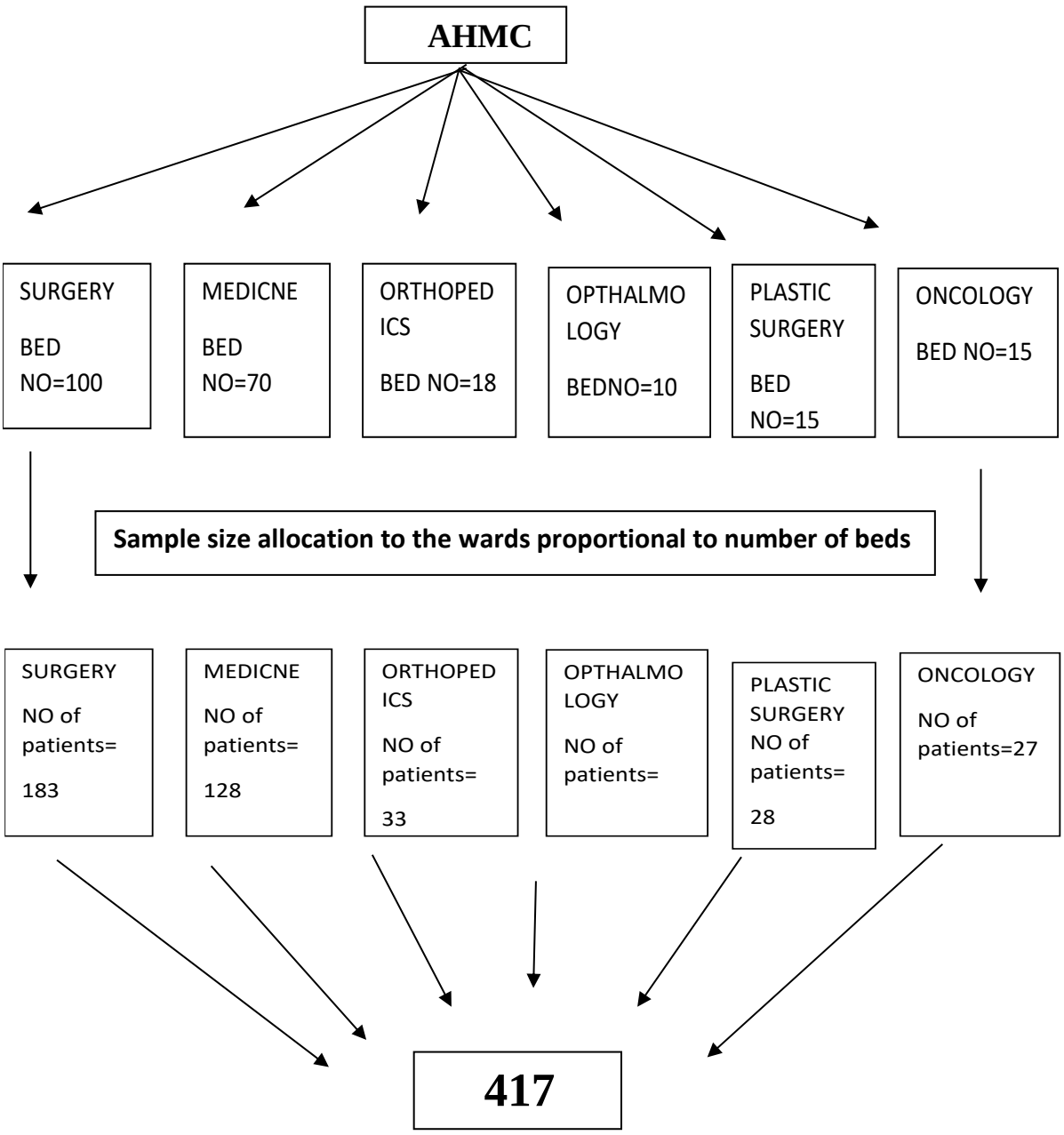

Figure 2 *schematic presentation of sampling procedure*

3.7Data collection method

3.7.1. Data collection instrument

Data was collected through interviewer guided questionnaire with in the planned period .two interviewers(Nurses) who were given prior training about the tool administered and one supervisor(Public health) was in charge of the overall supervision and daily assessment of the data alongside the principal investigator .the questionnaire contains sociodemographic (age, sex, religion, marital status and occupation), anthropometric (usual normal weight, present weight,), and clinical data (diagnosis at admission, type of surgery, change in dietary intake, significant GI symptoms, functional capacity, loss of subcutaneous fat muscle wastage, edema, ascites).

3.7.2 Data collectors and supervisor

2 nurse data collectors with experience of working in hospital setting were assigned one for each unit to extract and collect the data. they were given debrief about the tool and the whole process prior to the starting of the job and daily supervision on the submitted data was done by one supervisor (public health) and principal investigator

3.7.3 Data collection procedure

Data was collected by the assigned data collectors starting from the day of admission to discharge it was interviewer administered which was translated in language they can understand (A/Oromo or Amharic). In addition, the assigned data collector took anthropometric measurements and physical examination.

3.8 variables

3.8.1 Exposure variables and their measurement

Nutritional assessment at admission

Nutritional assessment was done for patients with in 24hr of admission using subjective global assessment (SGA) Subjective Global Assessment is a validated nutrition assessment tool for adult patients comprising of two sections: a medical history and a physical examination {Detsky,

1987; Pirlich, 2001}. In medical history, five components were assessed, weight at admission, dietary intake, the presence of gastrointestinal symptoms, and functional impairment through questioning the patient. The second part of the SGA focused on physical evidence of malnutrition assessed on subcutaneous fat loss, muscle tone and bulk, edema/fluid overload, and noted as either normal (0), mild (1 +), moderate (2+), or severe (3+). After collecting the SGA part patients were assigned a nutrition rating of SGA-A (well-nourished), SGA-B (moderately or suspected malnourished), or SGA-C (severely malnourished).

Change in weight will be calculated by the formula

% Weight loss= [(usual weight (kg) – current weight) / usual weight.] x 100

Dietary intake: -if there is a significant decrease in dietary intake (>50% of the plate)

Gastrointestinal Symptoms: include nausea, vomiting, dysphagia, diarrhea

Functional Capacity – patients who are malnourished are frequently less mobile (ambulatory, bedridden)

Metabolic demand – patients with inflammatory diseases (e.g. infections) are likely to become malnourished sooner due to ↑ muscle breakdown

3.8.2 Covariate

Demographic and socio-Economic Characteristics

Socio demographic characteristics like sex which was described as male or female, age, religion, marital status, level of education, living arrangement before admission and average monthly income were also included. Age was recorded in complete years. Marital status was classified as single, married, widowed and divorced.

Educational status was graded as 1) if unable to read and/or write 2) can read and write 3) primary education 4) secondary education 5) some collage and technical schools 6) higher institution graduate

Living arrangements prior to admission was categorized (Alone at home vs Lives with others at home vs Other (not at home); Other" includes supportive housing, retirement home/assisted living, nursing home, and patients with no permanent home.

Medical conditions

Patients which we involved in this study were admitted medical surgical and minor wards. Since there were variety of cases and diagnosis they were classified in to 11 broad standard categories (Cardio vascular, Genitourinary, Gastro intestine, Musculoskeletal, Respiratory, Hematology, Neurology, Metabolic, Surgical, Trauma).

Number of medication, presence of any comorbidity, history of previous admission and if they had any surgical procedure were also the questions assessed related to patients medical condition.

Outcome variable

Length of hospital stay: LOS was determined by subtracting from the date of discharge from the date of admission /days from hospital admission to discharge

3.9 Operational definition

- Event (outcome): in this case the event is patient who was discharged from the hospital on any particular day alive (Recovery)
  - Censored : patients who stayed longer than 20 day in hospital ,died in the hospital or referred to another institution before their treatment is over are considered censored

- Length of hospital stay: LOS was determined from the date of hospital admission to discharge/days from hospital admission to discharge
- Subjective global assessment nutritional status classification: -
  - Well-nourished: No decrease in food/nutrient intake; < 5% weight loss; no/minimal symptoms affecting food intake; no deficit in function; no deficit in fat or muscle mass OR *an individual with criteria for SGA B or C but with recent adequate food intake; non-fluid weight gain; significant recent improvement in symptoms allowing adequate oral intake; significant recent improvement in function; and chronic deficit in fat and muscle mass but with recent clinical improvement in function.
  - Mildly/moderately malnourished: Definite decrease in food/nutrient intake; 5% - 10% weight loss without stabilization or gain; mild/some symptoms affecting food intake; moderate functional deficit or recent deterioration; mild/moderate loss of fat and/or muscle mass OR *an individual meeting criterion for SGA C but with improvement (but

not adequate) of oral intake, recent stabilization of weight, decrease in symptoms affecting oral intake, and stabilization of functional status.

- Severely malnourished: Severe deficit in food/nutrient intake; > 10% weight loss which is ongoing; significant symptoms affecting food/ nutrient intake; severe functional deficit OR *recent significant deterioration obvious signs of fat and/or muscle loss.

3.10 Data quality control

The quality of the data was insured by proper designing and pre testing of the questionnaire in other patients who did not participate in the study but came from similar background and sociodemographic characteristics in order to insure validity

Training was given for data collectors on SGA administration, data collection techniques and procedures based on the questionnaire, weight measurement and overall objective of the study

The questionnaire was reviewed daily for completeness by the principal investigator and proper feedback was given for data collectors as soon as possible. Questionnaire with missed variable was returned to the data collectors to be rechecked and corrected.

Measuring equipment was checked regularly with standard weight before data collection and faulty equipment was replaced with well functional equipment

3.11 Data processing and analysis

Data were entered into EpiData then it was checked and cleaned for consistency and any missing values. Finally, it was exported to STATA version 17.0 for analysis. Descriptive analysis was performed to describe the study variables. Frequency analysis was run for socio-demographic and economic, diseases classification, Prevalence of malnutrition based on SGA criteria estimated. To see the association between the nutrition status SGA (A, B, and C) and selected variables, we conducted a chi square tests for categorical variables (Age, sex, living arrangement, wealth and disease related variables)

Bivariable and multivariable cox regression were conducted to assess the effect of malnutrition (according to SGA Criteria), on LOS. Based on the results of bivariable analyses and clinical input, SGA categories B and C were combined for multivariable analyses. In this study, goodness-of-fit (GOF) particularly the Schoenfeld residuals proportional hazard assumption

test was checked. The baseline proportional hazard was assumed constant and Cox proportional hazard assumption was tested. If P-value > 0.05, then the proportional hazard assumption is fulfilled and accepted. Variables with P-value of less than 0.25 were included to the multivariable model. In the multivariable analysis P– values < 0.05 was used to declare statistical significance. Adjusted hazard ratio (AHR) with a 95% confidence interval was used to report the strength and direction of association between malnutrition at admission and length of stay.

3.12 Ethical consideration

Haramaya University, College of Health and Medical Sciences institutional health research review committee (IHRERC) approved the protocol and issue ethical clearance then, official letter of cooperation written from the college of health and medical science of Haramaya University was submitted to oromia health beurau then letter was written to Adama Hospital Medical College. After explaining the objective, data collection process, benefits and risks of the study informed voluntary written and signed consent was obtained from the participants and head of the hospital. To maintain anonymity no personal identifiers were included on the questionnaire. Measures to maintain human rights such as informed consent, right to participate, privacy and confidentiality, and right to be prevented from any harm was taken into consideration Patients identified as at risk of malnutrition were linked to further nutritional intervention

3.14Information dissemination

The result of this study will be disseminated to Haramaya university school of public health, adama hospital medical college ,Oromia health bureau . In addition, great efforts will be made to disseminate the results through presentation in different seminars, workshop, scientific conference. Attempts will also be made to publish the information on reputable peer reviewed journal.

4.RESULT

4.1 Socio demographic and economic characteristics

In this study, 417 patients were initially recruited, with a high response rate of 96%, resulting in 401 participants being included in the final analysis. Of these, 227 (56.6%) were females. The median age of the participants was 40 years, with an interquartile range of 27 years, meaning the middle 50% of participants were aged between 29 and 56 years. In terms of religious affiliation, 168 participants (41.8%) identified as Orthodox Christian, followed by 139 Muslims (34.6%), 75 Protestants (18.7%), and 19 Catholics (4.74%). The majority of participants, 267 (65%), were married (Table 1).

Table 1 Socio-demographic and economic characteristics of adult hospitalized patients in Adama Hospital Medical College, Adama, Central Ethiopia, 2024

Variables	**Category**	**Frequency**	**Percentage (%)**
Sex	Male	174	43.39
	Female	227	56.61
Religion	Muslim	139	34.66
	Orthodox	168	41.90
	Protestant	75	18.70
	Catholic	19	4.74
Marital status	Single	74	18.45
	Married	262	65.34
	Widowed	46	11.47
	Divorced	19	4.74
Occupation	House wife	101	25.19
	Farmer	94	23.44
	Civil servant	80	19.95
	Merchant	73	18.20
	Daily labourer	9	2.24
	Student	40	9.98
	Others	4	1.00
Educational status	Unable to read and write	52	12.97
	Able to read and write	93	23.19
	Primary (1-8)	61	15.21
	Secondary (9-12)	78	19.45
	Higher education	91	22.69
	Technical and vocational training	26	6.48
Residency	Urban	202	50.37
	Rural	199	49.63
Living arrangement	Living alone	62	15.46
	Living with a partner	259	64.59
	Living with a parent/s	65	16.21
	Other	15	3.74

Monthly income (in ETB)	<3000	24	5.99
	3000-5000	45	11.22
	5000-10000	191	47.63
	10000-15000	90	22.44
	>15000	51	12.72

4.2. Primary diagnosis for admission

In this study, patients were classified into 10 broad categories based on their initial diagnoses. The graph below shows the distribution of patients in each category by count. Gastrointestinal conditions were the most common, with 99 admissions out of 401 participants, followed by urological conditions with 56 admissions, respiratory conditions with 55 admissions, and trauma-related cases with 52 admissions. This distribution highlights the diverse range of medical conditions affecting the study participants.

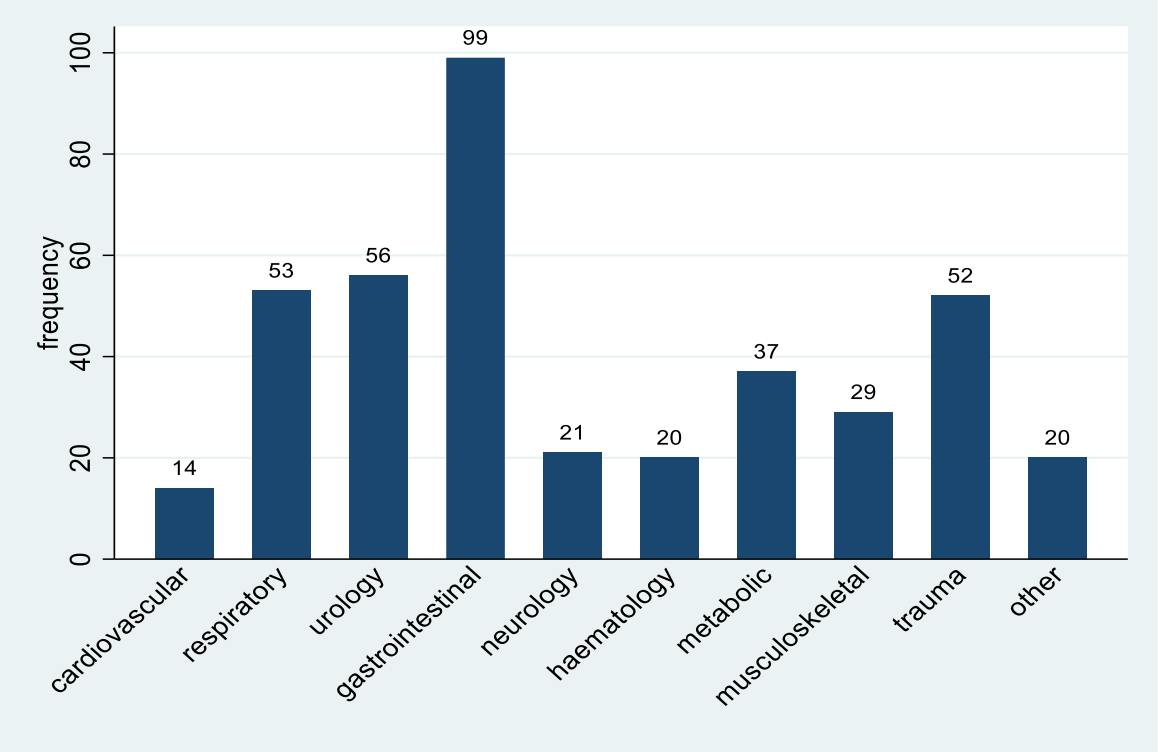

Figure 3: distribution of patients by Primary admission diagnosis, Adama Hospital Medical College, Adama, Central Ethiopia, 2024

4.3. Magnitude of malnutrition at admission

Out of the 401 patients who participated in this study, the overall number of malnourished patients (moderately malnourished + severely malnourished at admission was 217 which is (54.1% with 95% CI (49.1% , 58.9%), while 184 45.8% with 95% CI 41 % 50.8%)patients were well nourished From the 217 patients that were malnourished at admission using the SGA criteria, 175 (43.6%) with 95% CI: (38.7%, 48.7%) were moderately malnourished and 42 (10.5%) with 95% CI: (7.7%, 13.9%) were severely malnourished.

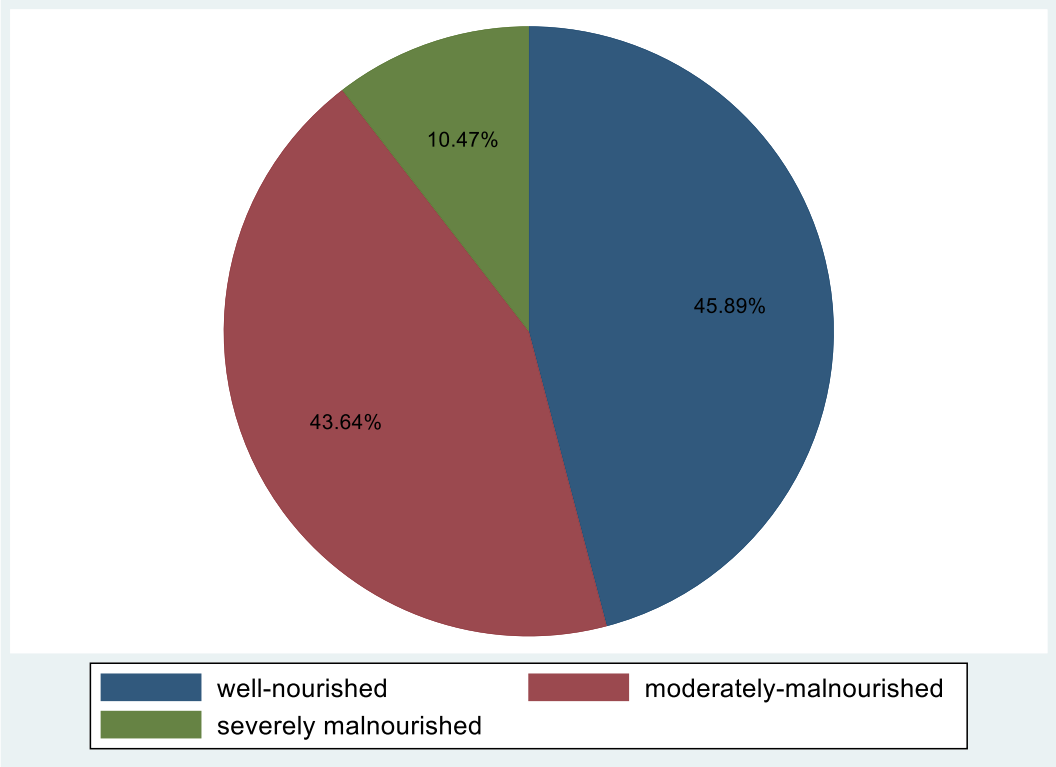

Figure 4:Magnitude of malnutrition among adult hospitalized patients in Adama Hospital Medical College, Adama, Central Ethiopia, 2024

The magnitude of malnutrition at admission varied across different hospital departments. The medicine department had the highest proportion of malnourished patients, with 28.9% of the total 401 study participants being malnourished upon admission. This was followed by the

surgery department, where 25.1% of the total participants were malnourished at admission.

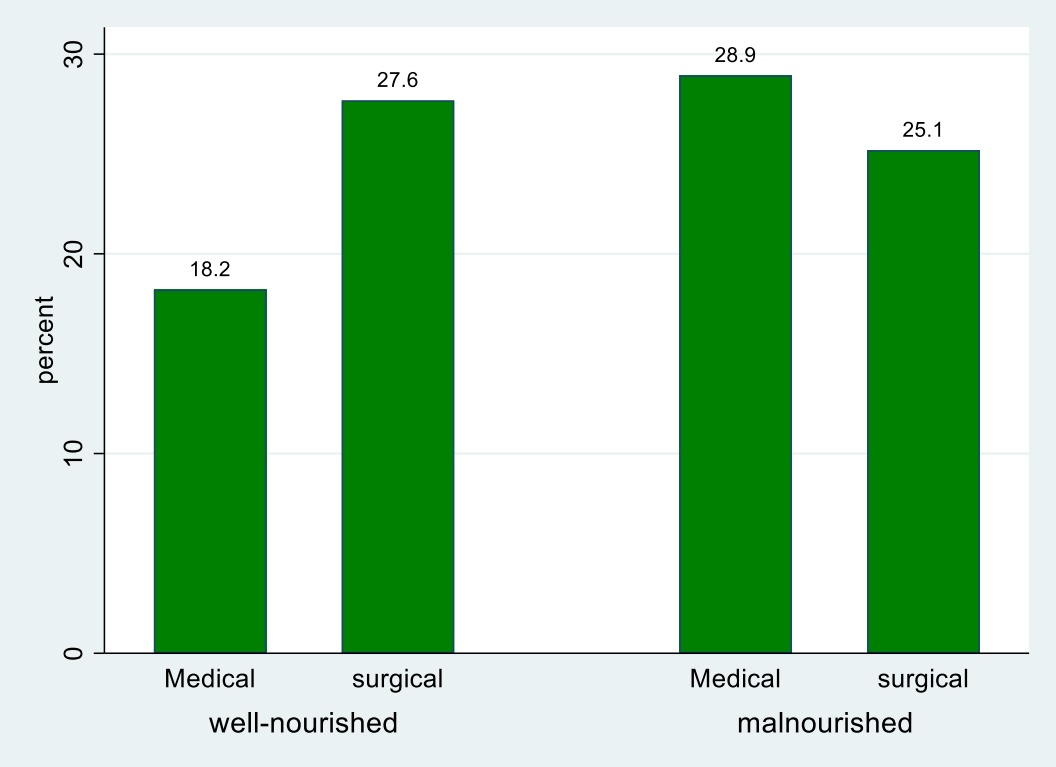

Figure 5:Percentage of Nutritional status of adult hospitalized patients per department of admission in Adama Hospital Medical College, Adama, Central Ethiopia, 2024

The rate of malnutrition varied based on different admission-related factors. Patients over 60 years of age had a higher malnutrition rate (65.4%) compared to those aged 60 or younger (51.25%) (P=0.022). By occupation, housewives had the highest rate of malnutrition (65.3%), followed by farmers (64%), individuals in the "other" category (50%), civil servants (45%), merchants (45%), and daily laborers (44%) (P=0.017).

Education level also played a role in malnutrition rates. Patients who were unable to read and write had a malnutrition rate of 65%, while those with basic literacy but no formal education had a rate of 63.4%. In contrast, those with higher education (42.8%) and vocational training (38.4%) had lower rates of malnutrition (P=0.021).

Place of residence was another important factor. Patients from rural areas had a higher rate of malnutrition (62.3%) compared to those from urban areas (46%) (P=0.001).

Patients with multiple diagnoses (comorbidities) were at greater risk of malnutrition (73.3%) than those with only one diagnosis (50.7%) (P=0.001). Additionally, more patients admitted to medical wards were malnourished (61.3%) compared to those in surgical wards (47.6%)

more likely to be malnourished (65.6%) than those without prior admissions (48.9%) (P=0.002).

Table 2: Chi square of Admission-related characteristics of the patients According to Nutrition Status (Subjective Global Assessment Categories) at Baseline in Adama Hospital Medical College, Adama, Central Ethiopia, 2024

Socio demographic characteristics

Variables	**Category**	**Nutritional status**		**P-Value**
		Well-nourished (N=184)	**Malnourished (N=217)**	
Age (in years)	<=60	156 (48.8%)	164 (51.2%)	0.022
	>60	28 (34.6%)	53 65.4%)	
Sex	Male	87(50.0%)	87(50.0%)	0.148
	Female	97(42.7%)	130(57.3%)	
Marital Status	Single	42(56.8%)	32(43.2%)	0.053
	Married	112(42.7%	150(57.3%	
	Widowed	18(39.1%)	28(60.9%)	
	Divorced	12(63.2%)	7(36.8%)	
Socioeconomic characteristics				
Occupation	Housewife	35(34.7%)	66(65.3%	0.017
	Farmer	35(37.2%)	59(62.8%)	
	Civil servant	44(55.0%)	36(45.0%)	

	Merchant	40(54.8%)	33(45.2%)	
	Daily labourer	5(55.6%)	4(44.4%)	
	Student	23(57.5%)	17(42.5%)	
	Others	2(50%)	2(50%)	
Educational status	Unable to read and write	18(34.6%)	34(65.4%)	0.021
	Able to read and write	34(36.6%	59(63.4%)	
	Primary (1-8)	29(47.5%)	32(52.5%	
	Secondary (9-12)	35(44.9%)	43(55.1%)	
	Higher education	52(57.1%)	39(42.9%)	
	Technical and vocational training	16(61.5%)	10(38.5%)	
Residency	Urban	109(54.0%	93(46.0%)	0.001
	Rural	75(37.7%)	124(62.3%)	
Living Arrangement	Living alone	34(54.8%)	28(45.2%)	0.215
	Living with a partner	109(42.1%)	150(57.9%)	
	Living with a parent/s	33(50.8%)	32(49.2%)	
	Other	8(53.3%)	7(46.7%)	

Monthly income	<3000	9(37.5%)	15(62.5%)	0.199
	3000-5000	18(40.0%)	27(60.0%)	
	5000-10000	86(45.0%)	105(55.0%)	
	10000-15000	40(44.4%)	50(55.6%)	
	>15000	31(60.8%	20(39.2%)	
Related to medical condition				
Admission ward	Medical	73(38.6%)	116(61.4%)	0.006
	Surgical	111(52.4%)	101(47.6%)	
Number of diagnoses	>=2	16(26.7%)	44(73.3%)	0.001
	Only one	168(49.3%)	173(50.7%)	
Any pervious admission	Yes	43(34.4%)	82(65.6%)	0.002
	No	141(51.1%)	135(48.9%)	

4.4 Length of hospital stay

A total of 401 patients with complete data on length of hospital stay (LOS) and relevant predictors were included in the analysis. These patients were followed for a combined total of 3,137 days. None of the patients died during the study period. However, 89 patients stayed in the ward for more than 20 days. Patients with a hospital stay longer than 20 days were treated as censored observations, while those discharged within 20 days of admission were considered events.

The probability of discharge within 20 days was 99 per 1,000 person-years. The median length of hospital stay was 7 days (95% CI: 6 to 7 days). The interquartile range (IQR) was 5 days, meaning that 50% of the participants stayed in the hospital for 5 to 10 days, representing the 25th and 75th percentiles, respectively. This distribution indicates that while half of the patients were discharged within a week.

There was a statistically significant difference in the length of hospital stay among patients based on their nutritional status. Patients classified as well-nourished had the shortest median hospital stay, with a median of 5 days and an interquartile range of 3 to 7 days. In contrast,

patients categorized as moderately malnourished had a longer median hospital stay of 9 days. Those classified as severely malnourished did not reach a median length of stay within the observed data, but 25% of these patients stayed in the hospital for at least 10 days. This indicates that severely malnourished patients had the longest hospital stays compared to both well-nourished and moderately malnourished patients.

Patients with a history of prior hospital admissions were found to stay in the hospital for longer periods compared to those without previous admissions. Specifically, patients who had been admitted before had a median hospital stay of 10 days, although the interquartile range (IQR) could not be determined due to the limited follow-up time. In contrast, patients without any previous admissions had a shorter median hospital stay of 6 days, with an interquartile range of 4 to 9 days. This difference suggests that a history of prior hospitalization is associated with prolonged hospital stays

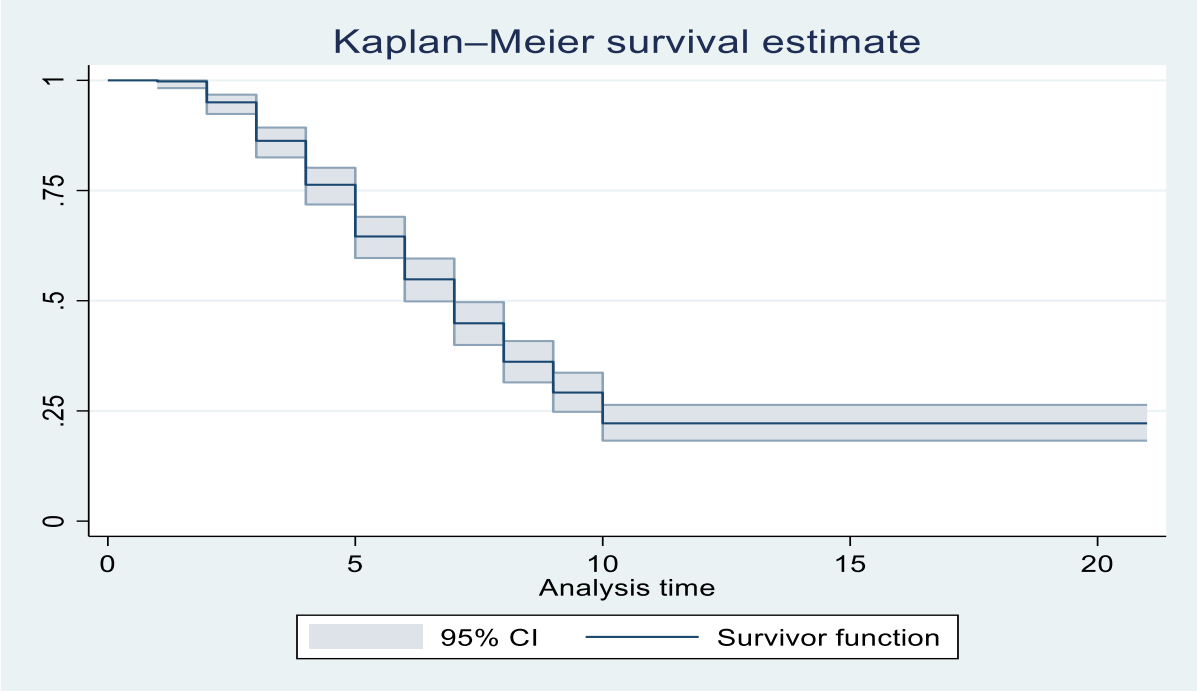

***Figure 6:** The overall Kaplan Meir survival curve estimate of length of hospital stay in Adama Hospital Medical College, Adama, Central Ethiopia, 2024*

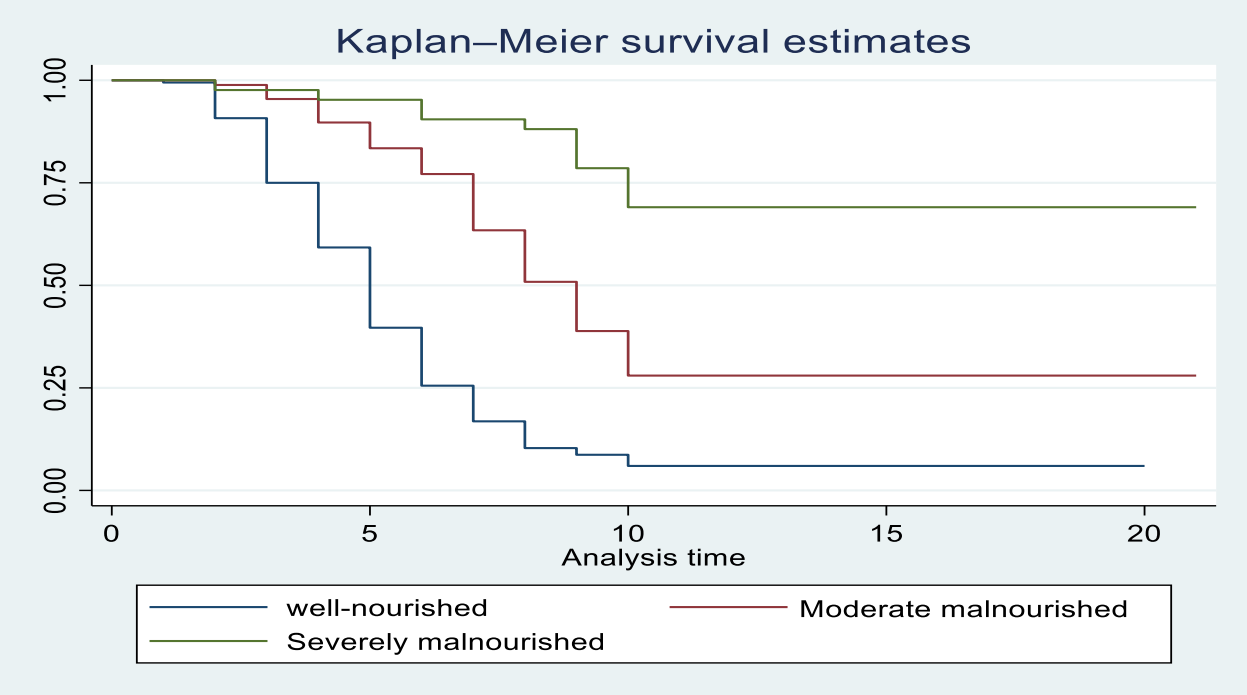

***Figure 7:** Kaplan-Meir curve comparing Length of hospital stay based on nutrition status in Adama Hospital Medical College, Adama, Central Ethiopia, 2024*

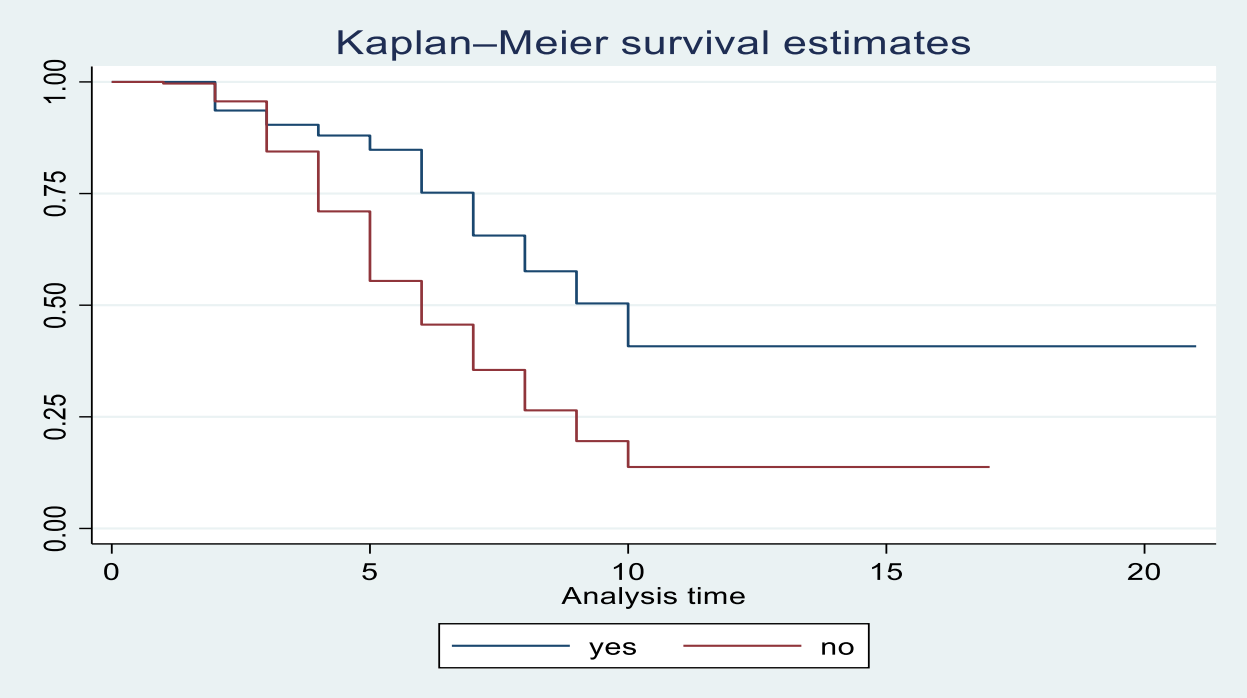

***Figure 8:** Kaplan-Meir curve comparing Length of hospital stay based on previous hospital admission status in Adama Hospital Medical College, Adama, Central Ethiopia, 2024*

4.5. The effect of malnutrition on length of hospital stay

To assess the effect of malnutrition on the length of hospital stay, covariates were selected for the model based on literature and clinical experience. These covariates included socio-demographic factors (age, sex, marital status, education, and residency), socio-economic factors (occupation, living arrangements, and monthly income), and disease-related characteristics (admission ward, comorbidity, admission history, nutritional status, and medication use).

Before fitting the model, the proportional hazards assumption was assessed using the global test, which resulted in a p-value of 0.57. This indicates that there is no significant evidence to suggest a violation of the proportional hazard assumption. Therefore, the effects of the covariates on the risk of the event remain consistent over time, allowing for confident use of the Cox proportional hazards model in the analysis.

In the bivariate Cox regression analysis, the following variables were found to be significant at a p-value threshold of <0.25: age and nutritional status (SGA) at admission (P<0.001), marital status (P=0.031), occupation (P=0.024), level of education (P=0.001), place of residence (P=0.001), admission ward (P=0.001), comorbidity (P=0.002), previous admission history, and any surgical procedures (P<0.001). The remaining variables were not significant and were excluded from the multivariable model.

The final multivariate model, which controlled for other significant factors, showed that malnutrition was independently associated with a prolonged length of hospital stay. Patients who were moderately malnourished had a 35% reduced rate of discharge compared to well-nourished patients (AHR = 0.35; 95% CI: 0.27, 0.46). This suggests that moderately malnourished patients were 65% less likely to be discharged at any given time compared to those who were well-nourished. Similarly, patients who were severely malnourished had an 87% reduced rate of discharge compared to well-nourished patients (AHR = 0.13; 95% CI: 0.07, 0.23). This indicates that severely malnourished patients were 87% less likely to be discharged at any given point during their hospital stay.

History of previous hospital admission also found as a significant predictor of length of hospital stay when holding other significant variables constant. A history of previous hospital admission was identified as a significant predictor of the length of hospital stay, even when controlling for other variables. Patients without prior hospital admissions had a 92% higher rate

of discharge compared to those with previous admissions (AHR = 1.94; 95% CI: 1.41, 2.67). This means that patients with a history of prior hospitalizations tended to stay longer in the hospital

Table 3: Multivariable cox regression analysis model for the effect of malnutrition on the length of hospital stay among adult patients in Adama Hospital Medical College, Adama, Central Ethiopia, 2024

Variables	**Category**	**Survival status**		**Bivariate analysis**		**Multivariate analysis**	
		Recovered	**Censored**	**CHR(95% CI)**	**P – value**	**AHR(95% CI)**	**P – value**
Nutritional status	well-nourished	173	11				
	Moderate malnourished	126	49	0.35(0.28, 0.45)	<0.001	0.35(0.27, 0.45)	<0.001
	Severely malnourished	13	29	0.11(0.06, 0.20)	<0.001	0.13(0.07, 0.23)	<0.001
Age (in years)	<=60	262	58				
	>60	50	31	0.58(0.43, 0.78)	<0.001	1.09(0.73, 1.63)	0.110
Marital Status	Single	63	11				
	Married	201	61	0.73(0.55, 0.97)	0.031	1.03(0.69, 1.54)	0.500
	Widowed	33	13	0.61(0.40. 0.93)	0.020	0.95(0.56, 1.58)	0.456
	Divorced	15	4	0.89(0.51, 1.57)	0.689	1.22(0.63, 2.34)	0.654
Occupation	Housewife	75	26				
	Farmer	65	29	0.92(0.66, 1.28)	0.603	1.25(0.86, 1.80)	0.775
	Civil servant	71	9	1.45(1.05, 2.01)	0.024	2.35(0.71, 7.76)	0.159

	Merchant	54	19	1.17(0.82, 1.65)	0.392	0.99(0.38, 2.58)	0.980
	Daily labourer	8	1	1.72(0.83, 3.57)	0.146	6.30(1.03, 38.50)	0.046
	Student	35	5	1.54(1.03,2 .30)	0.035	4.06(0.60, 27.48)	0.151
	Others	4	0	1.81(0.66, 4.96)	0.247	1.82(0.34, 9.75)	0.482
Educational status	Unable to read and write	33	19				
	Able to read and write	62	31	1.14(0.75,1 .74)	0.550	1.57(0.68, 3.63)	0.288
	Primary (1-8)	51	10	1.83(1.18, 2.83)	0.007	0.99(0.37, 2.63)	0.984
	Secondary (9-12)	67	11	1.89(1.25, 2.87)	0.003	1.23(0.34, 4.49)	0.753
	Higher education	79	12	1.96(1.31, 2.95)	0.001	1.40(0.39, 5.00)	0.602
	Technical and vocational training	20	6	1.49(0.85, 2.60)	0.159	1.11(0.32, 3.79)	0.872
Residency	Urban	169	33				
	Rural	143	56	0.70(0.56, 0.87)	0.001	1.56(0.78, 3.10)	0.210
Admission ward	Medical		57				
	Surgical	37	32	1.45(1.16, 1.82)	0.001	1.20(0.93, 1.56)	0.154
Comorbidity	Yes	145	25				
	No	68	64	1.73(1.22, 2.46)	0.002	0.90(0.61, 1.34)	0.614
Any pervious admission	Yes	43	51				
	No	132	38	2.18(1.68,2 .83)	<0.0 01	1.94(1.41, 2.67)	<0.00 1

4.6 Model goodness of fit

The analysis revealed a Cox-Snell residual plot with a straight line at a 45-degree angle, indicating a strong goodness of fit for the Cox proportional hazards model. This alignment suggests that the predicted survival times closely match the observed data, confirming that the model effectively captures the underlying relationship in the dataset. Overall, these findings support the validity of the model and its assumptions for analyzing the effects of covariates on survival.

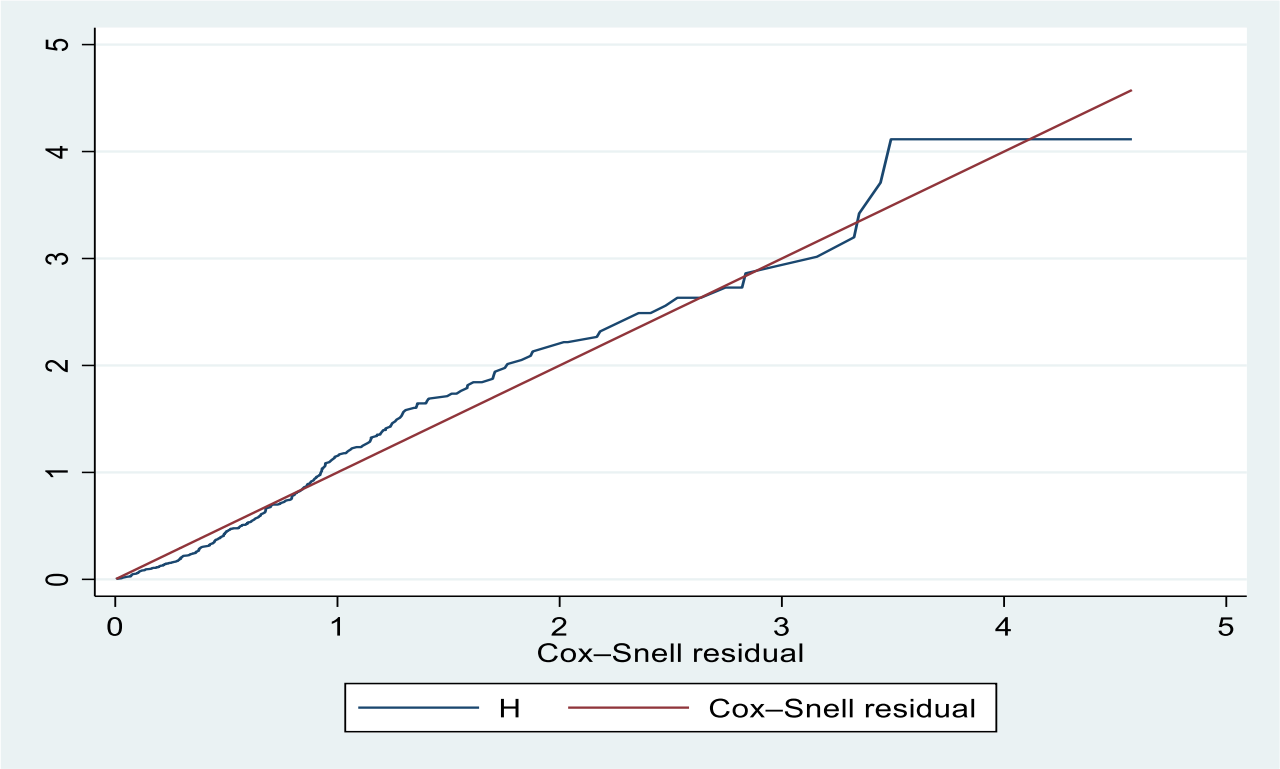

Figure 9:Cox-Snell residual assumption graph for overall model goodness of fitness:

5.DISCUSSION

Despite being well known that it is abundant in hospital setting, malnutrition at admission stays undetected and untreated most of the time in our setting. Detecting and treating malnutrition at admission should be included in the inpatient care since it has huge economic and clinical effect.(Luma et al. 2017). There are plenty of nutritional assessment methods that are used around the globe but there is none that is labeled as gold standard. The most universally accepted method for evaluating malnutrition is subjective global assessment (SGA). SGA has been used in various patient populations worldwide and is associated with clinical outcomes.(Correia and Waitzberg 2003, Pirlich, et al. 2005, Pirlich, et al. 2006, Baccaro, et al. 2007, Lim, et al. 2012, Nigatu, et al. 2021)

This study revealed a high prevalence of malnutrition at admission, with 54% of patients being classified as malnourished. This agrees with a study conducted across four referral hospitals in Amhara National Regional State, which reported a malnutrition rate of 55.6% (Tesfaye, et al. 2015). Similarly, study at the largest tertiary referral hospital in Ethiopia found a 62% prevalence of malnutrition at admission (Nigatu, et al. 2021). However, the prevalence observed in this study was lower compared to the 75% found at Mizan Tepi hospital in 2020 and the 72.6% reported in a multi-center cohort study across three African countries, where higher rates were seen in Kenya and Ghana (Blaauw, et al. 2019). These discrepancies can be attributed to advancements in nutritional screening and management, as well as regional differences. This study was conducted in central Ethiopia, an area more developed than the locations of the other studies, which could explain the slightly lower prevalence of malnutrition observed.

In contrast, this study found a higher prevalence of malnutrition compared to studies from developed countries. For instance, Gout et al. (2008) reported a malnutrition rate of only 23% in Australian tertiary hospitals using the SGA (Barker, Gout et al. 2011), while Pirlich et al. (2006) found a rate of 27.4% across 13 hospitals in Germany (Pirlich, et al. 2006). Despite similar methods of assessing nutritional status at admission, these differences could be explained by the vastly different socioeconomic conditions and healthcare resources (McWhirter and Pennington 1994, Norman, et al. 2008, Rasmussen, et al. 2010).

In terms of hospital length of stay (LOS), this study found that malnutrition at admission was strongly associated with prolonged LOS. Malnourished patients stayed significantly longer in the hospital compared to their well-nourished counterparts. This finding aligns with several other studies. For example, a study conducted at Tikur Anbessa Specialized Hospital in Ethiopia demonstrated that malnourished patients had a significantly longer LOS (9.8 days vs. 5.2 days, $p<0.001$) (Nigatu, et al. 2021). Similar results were observed in South Africa, where malnourished patients had a mean LOS of 7.4 days, compared to 5.2 days for well-nourished patients (Moens, 2016). In Ghana, a study also found that malnutrition at admission was associated with a longer LOS (9.70 days vs. 5.95 days, $p<0.001$) (Nyatfe, 2017). Internationally, a Canadian study found a significant association between malnutrition and prolonged LOS, with a hazard ratio of 0.73 (95% CI, 0.62–0.86) (Allard, et al. 2016), and a Korean study demonstrated that patients with moderate and severe malnutrition had longer stays compared to well-nourished patients (Kang, et al. 2018). The variations in LOS across these different countries and regions may be due to differences in malnutrition screening protocols, the severity of primary diagnoses, and available healthcare resources.

Moreover, this study demonstrated that patients with a history of previous hospital admission were more likely to have an extended hospital stay compared to those without cancer. This result is consistent with a study conducted in Addis Ababa's Tikur Anbessa Specialized Hospital, which found that cancer patients had a longer LOS (HR = 0.57, 95% CI: 0.4–0.7) (Nigatu et al. 2021).

The consistent findings across various studies globally indicate that malnutrition at admission plays a significant role in increasing LOS. The prolonged hospital stay not only has clinical consequences but also leads to increased healthcare costs and strains hospital resources, such as patient flow and bed availability. As a result, it is critical that nutritional assessments be routinely integrated into hospital admission processes to minimize malnutrition-related complications and improve healthcare efficiency.

This study has several strengths, including its contribution to understanding the prevalence of malnutrition at admission and its effect on hospital LOS in an Ethiopian referral hospital setting. The study adds to the growing evidence that links malnutrition with prolonged hospitalization and its associated clinical and economic burdens. However, the study has limitations, such as the use of a single-site location, which may limit the generalizability of the

findings. Additionally, potential variations in nutritional assessment methods could have influenced the results. Despite these limitations, this study underscores the critical need for routine nutritional screening and intervention at admission to mitigate the impact of malnutrition on patient outcomes and healthcare costs.

6.STRENGTH AND LIMITATION OF THE STUDY

6.1 Strength of the study

The strength of this study is it used SGA as nutritional assessment method which is considered to be more accurate than other nutritional assessment method in hospitalized patients. And the hospital is serving a catchment population from different regions of the country it helps in the data diversity and generalizability.

6.2 Limitation of the study

The limitation of this study was, First, nutritional status was only evaluated on the day of admission and patients who were already hospitalized were not included in this study; therefore, this study may have underestimated the malnutrition rate of all the hospitalized patient. Other limitations include the reliability of weight reports of the patients especially who came from rural parts is questionable. Their usual weights were determined subjectively using some memory technics. Furthermore, it could give a better result if more hospitals were recruited in the study, which potentially could influence the generalizability of our findings.

7.CONCLUSION AND RECCOMENDATION

7.1 Conclusion

In conclusion, malnutrition was highly prevalent among hospitalized adult patients with 217patients out of 401 (54.1% with 95%CI 49.1%,58.9%) being found malnourished at admission. From the 217 malnourished patients 175(43.6%) with (95% CI 38.7%,48.7%) were moderately malnourished and 42(10.5%) with 95% CI (7.7%,13.9%) were severely malnourished. Patients classified as well-nourished had the shortest median hospital stay, with a median of 5 days and an interquartile range of 3 to 7 days. In contrast, patients categorized as moderately malnourished had a longer median hospital stay of 9 days. Those classified as severely malnourished did not reach a median length of stay within the observed data, but 25% of these patients stayed in the hospital for at least 10 days. This indicates severely malnourished patients had longer hospital stay compared to both well-nourished and moderately nourished patients. patients who had been admitted before had a median hospital stay of 10 days, although the interquartile range (IQR) could not be determined due to the limited follow-up time. In contrast, patients without any previous admissions had a shorter median hospital stay of 6 days, with an interquartile range of 4 to 9 days indicating that patients with history of previous admission stayed longer in the hospital..

7.2 Recommendations

Based on the study findings; the following recommendations were made:

Clinicians

need to be aware of the impact of malnutrition and of the potential role of worsening nutritional Status in prolonging hospital stay, not only in critically ill bed ridden patients, but in all patients admitted to hospital who may require nutritional support and Nutritional assessment should be systematically included as part of the clinician's hospital practice.

Hospitals

should integrate Nutritional screening and assessment tool in their care packages for all patients admitted to hospital and hospital protocol should include and practice early nutritional

assessment as part of every medical examination at admission. Hospitals should also develop broader strategies to prevent and manage malnutrition, such as: proper use of available resources for detailed nutritional evaluations and implementation of nutrition care plans.

Interested researchers

shall conduct high-quality trials/ interventional studies focused on the effect of nutritional interventions on length of stay in hospitals if this can minimize or reduce length of hospital stay.

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9, ANNEXES

9.1 Information Sheet and Informed Voluntary Consent Form for Head office of Adama Hospital and Medical Collage

1.Introduction

My name is Hayat Ahmed. I am studying my master's degree in public health nutrition at Haramaya University, college of health and medical sciences. I kindly request you to lend me your attention to explain you about the study.

2.Title of the study

The effect of Malnutrition at Admission on Length of Hospital Stay among Adult Patients in Adama Hospital Medical College, Adama, Central Ethiopia: a Prospective Cohort Study

3.Purpose of the study

The findings of this study will have significant effect in improving the accessibility and effectiveness of the health system asfacilities will have the information and will be able to allocate resources where it is needed, develop proper health care plan and focus and put up proper supervision on patient's nutritional status assessment, intervention and proper referral system both at admission and stay at the hospital. Hospital this will reduce the economic and human cost of malnutrition. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfilment of a master's program in public health nutrition for the principal investigator.

4.Procedure and duration

I will be asking participants their socio demographic, clinical and nutritional information weight will also be measured and recorded by trained professionals. The questionnaire will be filled by

the data collectors interviewing the participants. Generally filling the questionnaire which consists of 36 questions and the measurements will take about 20 minutes maximum.

5.Risk and benefit:

The risk of being participating in this study is very minimal, taking few minutes from the participants time and they will have to weir minimal clothing during the measurement. There will 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.

6.Confidentiality

The information that we will be provided will be keep confidential. There will be no information that will identify the participants in particular. The findings of the study will be general for the study population and will not reflect anything particular of individual persons. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research

7.Rights:

Participation for this study is fully voluntary. The participants have the right to decide 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. Adama Hospital and Medical Collage 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

8.Contact address:

If there are any questions or enquires any time about the study or the procedures, please contact this address:

Principal Investigator -Hayat Ahmed

Phone no. 0934864644

Email – hayatas760@gmail.com

Institutional Research Ethics Review Committee

Office phone 0254662011 or

P. O. Box 235, Harar, Ethiopia

9.Declaration of informed voluntary consent:

I have read the participant information sheet. I have clearly understood the 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 question for things that may 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. I am also informed that the head office of Adama Hospital Medical College has 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. Therefore, I declared my voluntary consent on behalf of Adama Hospital Medical College management to allow this study to be conducted in the Hospital with my signature indicated below.

Name and signature of head of the office of Adama Hospital Medical College_____ _____date_____

Name and signature of the PI_____ _____date_____

9.2 Information Sheet and Informed Voluntary Consent Form for research participants(English version)

1.Introduction

My name is (_____). I am working as a data collector for the study being conducted in this Hospital by Hayat Ahmed who is studying for her master's degree in public health nutrition at Haramaya University, college of health and medical sciences. U were selected for this study as u are an adult patient admitted to the selected wards of the hospital during the study period.

2.Title of the study

The effect of Malnutrition at Admission on Length of Hospital Stay among Adult Patients in Adama Hospital Medical College, Adama, Central Ethiopia: a Prospective Cohort Study

3.Purpose of the study

The findings of this study will have significant effect in improving the accessibility and effectiveness of the health system as facilities will have the information and will be able to allocate resources where it is needed, develop proper health care plan and focus and put up proper supervision on patient's nutritional status assessment, intervention and proper referral system both at admission and stay at the hospital. Hospital this will reduce the economic and human cost of malnutrition. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfilment of a master's program in public health nutrition for the principal investigator.

4.Procedure and duration

I will be asking you your socio demographic, clinical and nutritional information weight will also be measured and recorded by trained professionals. The questionnaire will be filled by the data collectors interviewing the participants. Generally filling the questionnaire consisting 36 questions and the measurements will take about 20 minutes maximum.

5.Risk and benefit:

The risk of being participating in this study is very minimal, taking few minutes from your time and you will have to wear minimal clothing during the measurement. There will 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.

6.Confidentiality

The information that we will be provided will be keep confidential. There will be no information that will identify you in particular. The findings of the study will be general for the study population and will not reflect anything particular of individual persons. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research

7.Rights:

Participation for this study is fully voluntary. You have the right to decide 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 are entitled. They do not have to answer any question that they do not want to answer. Adama Hospital and Medical College 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

8.Contact address:

If there are any questions or enquires any time about the study or the procedures, please contact this address:

Principal Investigator -Hayat Ahmed

Phone no. 0934864644

Email – hayatas760@gmail.com

Institutional Research Ethics Review Committee

Office phone 0254662011 or

P. O. Box 235, Harar, Ethiopia

9.Declaration of informed voluntary consent:

It 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 may been unclear. I was informed that I have the right to withdraw at any time or not to answer any question that I do not want. Therefore, I declare my voluntary consent to allow myself to participate in this study with my signature.

Name and signature of the participant;_____date_____

Name and signature of data collector:

_____date_____

N.B: this is to be signed face to face in the presence of the data collector. Please provide a copy of this signed consent to the participant.

9.3 Information Sheet and Informed Voluntary Consent Form for research participants (Amharic version)

1. መግቢያ

እኔ (_____)እባላለው በ አዳማ ሆስፒታል እና መዲካል ኮሌጅ ወስጥ በ ሀያት አህመድ እየተሰራ በሚገኘው ጥናት ላይ መረጃ ሰብሳቢ በመሆን እየሰራው እገኛለው። ሀያት አህመድ በሃሮማያ ዩኒቨርሲቲ በጤና እና ህክምና ሳይንስ ኮሌጅ ሁለተኛ ዲግሪዋን በህብረተሰብ ጤና አመጋገብ እየተማረች ነው።ስለ ጥናቱ እና እርስዎ የጥናት ተካፋይ ሆነው እንዴት እንደተመረጡ ለእርስዎ ለማስረዳት ትኩረትዎን እንዲሰጡኝ በአክብሮት እጠይቃለሁ።

2.የጥናቱ ርዕስ በአዳማ ሆስፒታል ሜዲካል ኮሌጅ የአዋቂ ታማሚዎች የተመጣጠነ ምግብ እጥረት በሆስፒታል ቆይታ ጊዜያቸው ላይ የሚያሳድረው ተጽዕኖ ለማየት የሚደረግ የክትትል ዳሰሳ።

3.የጥናቱ ዓላማ የዚህ ጥናት ግኝቶች የጤና ስርዓቱን ተደራሽነት እና ውጤታማነት በማሻሻል ላይ ከፍተኛ ተጽእኖ ይኖራቸዋል ። ተቋማቱ የሀንን መረጃ በመጠቀም ግብዓቶችን በሚፈልጉበት ቦታ በመመደብ ተገቢውን የጤና እንክብካቤ እቅድ በማውጣት በትኩረት ታካሚዎች ላይ ተገቢውን ቁጥጥር ማድረግ ይችላሉ. የህም የአመጋገብ ሁኔታ ግምገማ፣ መከላከል እና ትክክለኛው የሪፈራል ስርዓት ወደ ሆስፒታል ሲገቡ እና ሲቆዩ ማድረግን ያካትታል በዚህም ተቋሙ በምግብ እጦት መክንያት ሊከሰት የሚችለውን ኢኮኖሚያዊ እና የሰው ሃይልን በክነት ይቀንሳል። በተጨማሪም በዋነኝነት የዚህ ጥናት ዓላማ ለዋና መርማሪው በሕዝብ ጤና አመጋገብ የማስተርስ መርሃ ግብርን ለማሟላት እንደ ከፊል መስፈርት ሆኖ ተሲስ መጻፍ ነው።

4.ሂደት እና ቆይታ

ተሳታፊዎች ሰለ ማህበራዊ ስነ-ሕዝብ፣ ክሊኒካዊ እና የአመጋገብ መረጃቸው የሚጠየቁ ሲሆን ክብደታቸው በሰለጠኑ ባለሙያዎች የሚለካ ይሆናል። መጠይቁን መረጃ ሰብሳቢዎች ተሳታፊዎችን ቃለ መጠይቅ በማድረግ ይሞሉታል። በአጠቃላይ መጠይቁን መሙላት እና ልኬቶቹ ቢበዛ 20 ደቂቃ ያህል ይወስዳል።

5.አደጋ እና ጥቅም; በዚህ ጥናት ውስጥ የመሳተፍ አደጋ በጣም ትንሽ ነው, ከተሳታፊዎች ጊዜ ጥቂት ደቂቃዎችን መውሰድ እና በመለኪያ ጊዜ አነስተኛ ልብሶችን ማልበስ ናቸው. በዚህ ጥናት ውስጥ በመሳተፍ ምንም አይነት ቀጥተኛ ክፍያ አይኖርም. ነገር ግን የዚህ ጥናት ግኝቶች ለአካባቢው የጤና እቅድ አውጪዎች ጠቃሚ መረጃን ሊያሳዩ ይችላሉ

.

6. ሚስጥራዊነት

የሚሰጡን የትኛዉም መረጃ በሚስጥር ይጠበቃል። በተለይ እርስዎን በተለየ ሁኔታ የሚገልፅ መረጃ አይኖርም። የጥናቱ ግኝቶች ለጥናቱ ተሳታፍዎች በአጠቃላይ ይገለጻል እና የእርስዎን የተለየ ነገር አያንፀባርቅም። መጠይቆቹ ስሞችን እንዳያሳዩ በመለያ ቁጥር ይደረጋሉ። እርስዎን ከጥናቱ ጋር ሊያገናኙዎት በሚችሉ የቃል ወይም የጽሁፍ መረጃዎች ምንም ማጣቀሻ አይደረግም።

7.መብቶች፡-

የዚህ ጥናት ተሳትፎ ሙሉ በሙሉ በፈቃደኝነት ላይ የተመሰረተ ነው። በዚህ ጥናት ለመሳተፍም ሆነ ላለመሳተፍ መብት አልዎት። ለመሳተፍ ከወሰኑ፣ በማንኛውም ጊዜ ከጥናቱ የመውጣት መብት አልዎት እና ይህ ከልሆነ እርስዎ ለሚሰጡት ጥቅማ ጥቅሞች አይከለከሉም። መመለስ የማይፈልጉትን ማንኛውንም ጥያቄ አለመመለስ ይችላሉ።

8.የመገናኛ አድራሻ፡- ስለ ጥናቱ ወይም አካሄዶቹ ማንኛውም አይነት ጥያቄ ካሎት ይህን አድራሻ በመጠቀም ያገኙናል፡- ዋና መርማሪ - ሀያት አህመድ ስልክ ቁጥር. 0934864644 ኢሜይል - hayatas760@gmail.com

የተቋማዊ ጥናትና ምርምር ሥነ-ምግባር ግምገማ ኮሚቴ

የቢሮ ስልክ 0254662011 ወይም

P. O. Box 235, Harar, Ethiopia

9.በመረጃ ላይ የተመሰረተ የፈቃደኝነት ስምምነት መግለጫ፡- የተሳታፊዎችን መረጃ ወረቀት አንብቤዋለሁ/ተነቦልኛል። የጥናቱ ዓላማ፣ አካሄዶች፣ ጉዳቶች እና ጥቅሞች፣ ሚስጥራዊ ጉዳዮች፣ የመሳተፍ መብቶች በግልፅ ተረድቻለሁ እና ለማንኛውም ጥያቄ የዋና መርማርዉን አድራሻውን አግንቸለዉ። ግልጽ ባልሆኑ ጉዳዮች ላይ ጥያቄዎችን እንድጠይቅ እድል ተሰጥቶኛል። በማንኛውም ጊዜ ከጥናቱ የመውጣት ወይም የማልፈልገውን ማንኛውንም ጥያቄ ያለመመለስ መብት እንዳለኝ ተነግሮኛል። ስለዚህ፣ በዚህ ጥናት ለመሳተፍ በፈቃደኝነት መስማማቴን በፊርማዬ አሳዉቃለዉ።

የጥናት ተሳታፊ ስም እና ፊርማ: _____ _____ ቀን _____ የመረጃ

ሰብሳብ ስም እና ፊርማ: _____ _____ ቀን _____

9.4 Information Sheet and Informed Voluntary Consent Form for research participants (Afanoromo version)

1.Seensa

Maqaan koo (_____). Qorannoo Hospitaala kana keessatti gaggeeffamaa jiruuf Hayat Ahmed Yunivarsiitii Haramayaa, kolleejjii saayinsii fayyaa fi yaalaa keessatti barnoota soorata fayyaa hawaasaatiin digrii lammaffaa barachaa jirtuuf ragaa walitti qabaa ta'ee hojjechaa jira. Issinis dhukkubsataa ga'eessota yeroo qorannichii gageefamu kutaalee hospitaalichaa filataman keessatti seenan waan ta'aniif qorannoo kanaaf filatamaniiru.

2.Mata duree qorannichaa

Dhiibbaa Hanqinni Nyaata Yeroo Seensaatti jiru Dheerinna Turtii Hospitaala Dhukkubsattoota Ga'eessotaa Kolleejjii Meedikaalaa Hospitaala Adaamaa irra geesiisu, Adama, Giddugaleessa Ethiopia Keessatti: Qo'annoo Koohortii Fuulduraa

3.Kaayyoo qorannichaa

Argannoon qorannoo kanaa dhaqqabummaa fi bu'a qabeessummaa sirna fayyaa fooyyessuu irratti dhiibbaa guddaa kan qabu yoo ta'u, dhaabbileen odeeffannoo waan qabaataniif qabeenya bakka barbaachisutti ramaduu, karoora eegumsa fayyaa sirrii ta'e qopheessuu fi xiyyeeffannoo fi to'annoo sirrii ta'e irratti kaa'uu waan danda'aniif madaallii haala soorataa dhukkubsataa, gidduu seensaa fi sirna rifaralaa sirrii yeroo seensaa fi turtii hospitaala. Hospitaala kun baasii dinagdee fi namaa hanqina nyaataa hir'isa. Kana malees, kaayyoon qorannoo kanaa qorataa ijoodhaaf sagantaa maastarsii soorata fayyaa hawaasaa galmaan ga'uuf akka barbaachisummaa gartokkeetti barruu qorannoo (thesis) barreessuudha.

4.Adeemsa fi turtii

Odeeffannoo hawaas dimogiraafii, kilinikaa fi soorataa keessanis ulfaatinni ogeessota leenji'aniin akka safaramu fi galmaa'u isin gaafadha. Gaaffiin kun kan guutamu namoota odeeffannoo walitti qaban hirmaattota af-gaaffii taasisaniin ta'a. Walumaagalatti gaaffilee gaaffilee 36 fi safartuuwwan of keessaa qabu guutuun yoo baay'ate gara daqiiqaa 20 ni fudhata.

5.Balaa fi faayidaa:

Balaan qorannoo kana irratti hirmaachuu baayyee xiqqaadha, yeroo keessan irraa daqiiqaa muraasa waan fudhatuuf yeroo safartuu uffata xiqqaa uffachuu qabdu. Qorannoon kun hirmaachuuf kaffaltiin kallattiin hin jiraatu. Garuu argannoon qorannoo kanarraa argamu karoorsitoota fayyaa naannoo sanaaf odeeffannoo barbaachisaa ta’e mul’isuu mala.

6.Iccitii eeguu

Odeeffannoon nuuf kennamu iccitii ta'ee ni eegama. Odeeffannoon addatti si adda baasu hin jiraatu. Argannoon qorannichaa ummata qorannichaaf waliigalaa kan ta’u yoo ta’u, namoota dhuunfaa irratti waan addaa kan hin calaqqisiifne ta’a. Gaaffiin maqaa agarsiisu akka hin dabalamneef koodii ni kennama. Gabaasa afaaniin ykn barreeffamaan hirmaattoota qorannicha waliin walqabsiisuu danda’u keessatti eeruun hin kennamu

7.Mirga:

Qorannoon kanaaf hirmaannaan guutummaatti fedhii ofiitiin kan raawwatamudha. Qo’annoo kana irratti hirmaachuu fi dhiisuu murteessuuf mirga qabda. Yoo hirmaachuuf murteessite yeroo barbaaddetti qorannicha keessaa ba’uuf mirga qabda kunis faayidaa kasaaraa karaa biraatiin siif malu kamiyyuu si hin mallatu. Gaaffii deebisuu hin barbaanne kamiifuu deebisuu hin qabdan. Hospitaalli fi Kolleejjiin Meedikaalaa Adaamaas adeemsa odeeffannoo walitti qabuu hospitaalicha keessatti hojiin badaa fi hojimaanni naamusa hin qabne yoo mul’ate qorannoon kun akka hin gaggeeffamne dhaabuuf mirga qaba

8.Akkaataa quunnamtii:

Yeroo kamiyyuu waa’ee qorannichaa ykn hojimaata gaaffiin ykn gaaffii yoo jiraate teessoo kana qunnamaa:

Qorataa Muummee -Hayat Ahmed

Bilbilaa lakk. 0934864644 irratti bilbila

Imeelii – hayatas760@gmail.com

Koree Gamaaggama Naamusa Qorannoo Dhaabbilee

Bilbila waajjira 0254662011 ykn

P. O. Box 235, Harar, Itoophiyaa

9.Eeyyama tola ooltummaa beekumsa qabu labsuu:

Waraqaan odeeffannoo hirmaattotaa naaf dubbifame. Kaayyoo qorannichaa, hojimaata, balaa fi faayidaa, dhimmoota iccitii, mirga hirmaachuu fi teessoo quunnamtii gaaffii kamiifuu sirriitti hubadheera. Wantoota ifa ta'uu dhiisuu danda'aniif gaaffii akkan gaafadhu carraan naaf kennameera. Yeroo barbaadetti ofirraa baasuu ykn gaaffii hin barbaanne kamiyyuu deebisuuf mirga akkan qabu naaf himameera. Kanaaf, mallattoo kootiin qorannoo kana irratti akkan hirmaadhuuf hayyama fedhii kootiin labsa.

Maqaa fi mallattoo hirmaataa;_____guyyaa_____ .

Maqaa fi mallattoo walitti qabaa odeeffannoo:

_____guyyaa_____ .

9.5 Data Collection Questionnaire

9.5.1 English version questionnaire

Part 1. Socio-demographic data

No	Questions	Categories
1	Age of respondent in years	
2	Sex	1, male 2, female
3	Religion	1, muslim 2, orthodox 3, protestant 4, catholic 5,other(specify)

4	**Marital status**	**1,single** **2,married** **3,widowed** **4,divorced/separated**
5	**Highest level of education**	**1,unable to read and write** **2,able to read and write** **3, primary(1-8)** **4,secondary (9-12)** **5, higher education** **6, technical and vocational training**

6	**Occupation**	**1,House wife** **2,Farmer** **3,Civil Servant** **4 Merchant** **5,Daily Laborer** **6,Student** **7,Other (specify)_**
7	**Place of residence**	**1, urban** **2, rural**

8	How is your living arrangement prior to admission?	1, Living alone 2.Living with a partner 3. Living with a parent/s 4.Other
9	Average monthly income of the household	_____
PART 2, Clinical data		
10	**Admission ward**	**1.Medical** **2.surgical**

11	**Primary diagnosis for admission** **(observe from patients medical card)**	**1.cardiovascular 2,respiratory** **3,genitourinary** **4,gastrointestinal** **5,neurologic** **6,hematology** **7,metabolic** **8,musculoskeletal** **9,trauma** **10, other**

12	**Primary Specific diagnosis for admission** **(observe from patients medical card)**	**_____**
13	**Any Secondary diagnosis(comorbidity)** **(observe from patients medical card)**	**1,yes** **2,no**
14	**If yes name** **(observe from patients medical card)**	**_____**
15	**Any Diagnosis of cancer** **(observe from patients medical card)**	**1,yes** **2,no**

16	**Any diagnosed infection** **(observe from patients medical card)**	**1,yes** **2,no**
17	**Are you taking any drugs currently** **(observe from patients medical card)**	**1,yes** **2,no**
18	**How many drugs are you taking** **(observe from patients medical card)**	**__ __**
19	**Any previous admission or surgery in the past 5 years**	**1,yes** **2,no**

20	**How many admissions have you previously had**	___ ___
	PART 3 Subjective global assessment	
21	**Have you lost weight in the past 6 months**	**1,yes** **2,no**
22	What was your usual weight before the disease?	
23	Current weight (measure)	
24	Is there any change in your dietary intake after the disease	**1,yes** **2,no**
25	If yes, What kind of dietary intake change is there	**1,poor and decreasing**
		2,border line and improving **3,staervation or unable to eat**
26	What type of diet are u currently taking	**1,solid and liquid** **2,semi liquid** **3, full liquid diet** **4.starvatiom**

27 **28**	Do you have any of these symptoms persisting for more than two weeks Is there any change in your functional ability	**1,aneroxia 1,yes 2,no** **2,nausea 1,yes 2,no** **3, vomiting 1,yes 2,no 4,deharea 1,yes 2,no** **1,yes** **2,no**
29	What is the type of change in your functional ability	1,Working sub optimally 2,Ambulatory 3,Bedridden
	Physical examination	
30	**Loss of SC fat (triceps)** Remark None (Fingers don't touch) Low to moderate (Fingers nearly meet) Severe (Fingers touch)	1,none 2,low to moderate 3,severe

31	**Muscle wasting (clavicle area)** Remark Muscle loss not presenting; visible, but prominent in females (Low to moderate) In males: a portion of the clavicle is visible In females: the clavicle is prominent deltoid and chest muscle is still intact (Severe) Evident protrusion	1, none 2, low to moderate 3, severe
32	**Edema** Remark Mild edema…. localized to lower extremities (Ankle, pedal, tibial) Severe edema……generalized edema	1.no edema 2, mild edema 3, severe edema
	Part 4,length of stay	
33	**Admission date dd/mm/yy**	___ ___/___ ___/___ ___ ___ ___
34	**Any surgical procedure**	1,yes 2,no
35	**Date of surgical procedure**	___ ___/___ ___/___ ___ ___ ___

36	**Date of discharge**	___ ___/ ___ ___/ ___ ___ ___ ___

THANK YOU FOR YOUR PARTICIPATION AND TIME

9.5.2 Amharic version questionnaire

ቁጥር	ጥያቄ	ኮድ
1	እድሜህ/ሽ ሰንት ነው	እድሜ በሙሉ አመት
2	ጾታ	1 ወንድ 2 ሴት
3	ሃይማኖትህ/ሽ ምንድነው	1 ሙስሊም 2 ኦርቶዶክስ 3 ፕሮቴስታንት 4 ካቶሊክ 5 ሌላ ይግለጹ
4	የጋብቻ ሁኔታ ምን ይመስላል	1 ያላገባ/ች 2 ያገባ/ች 3 የሞተባት/የሞተበት 4 የተፋታ/ች ወይም የተለያየ/ች
5	የትምህርት ደረጃዎ	1 ማንበብ እና መጻፍ የማይችል/የማትችል 2 ማንበብ እና መጻፍ የሚችል/የምትችል

		3 አንደኛ ደረጃ (1-8) 4 ሁለተኛ ደረጃ (9-12) 5 ከፍተኛ የትምህርት ተቋም (ዩኒቨርስቲ/ኮሌጅ) 6 ተክኒክ እና ሙያ
6	ሰራዎ ምንደነው	1 የቤት እመቤት 2 ገበሬ 3 የመንግስት ሰራተኛ 4 ነጋዴ 5 የቀን ሰራተኛ 6 ተማሪ 7 ሌላ (የግለጹ)
7	የመኖሪያ አድራሻ	1 ከተማ 2 ገጠር
8	ሆስፒታል ከመግባቶ በፊት የነበሮት የአኗኗር ሁኔታ ምን ይመስላል	1 ለብቻ 2 የተዳር አጋር ጋር 3 ከ ቤተሰብ ጋር 4 ሌላ የግለጹ
9	አማካይ ወርሃዊ የቤተሰቡ ገቢ	_____
	ከፍል 2 መሰረታዊ የጠና ነክ መረጃዎች	

10	የተኙበት ክፍል	1 የውስጥ ደዌ 2 ቀዶ ጥገና 3 የአይን ሀክምና 4 የአጥንት ሀክምና

		5 ፕላስቲክ ቀዶ ሀክምና 6 የ ካንሰር ታማሚዎች ክፍል
11	ዋና የገቡበት የበሽታ አይነት	1 የልብና የደም ቧንቧ በሽታ 2 የመተንፈሻ አካላት በሽታ 3 የኩላሊት እና የሽንት ቧንቧ በሽታ 4 የጨጓራ እና የአንጀት በሽታ 5 የነርቭ በሽታ 6 የደምና ተያያዥ በሽታ 7 የመታቦኦሊክ በሽታ 8 የጡንቻ እና የአጥንት በሽታ 9 ድንገተኛ አደጋ 10 ሌላ (ይግለጹ)
12	የበሽታው ሰም እና አይነቱ በዝርዝር (ከታካሚው የህክምና ካርድ ላይ ይመልከቱ)	
13	ከገቡበት ሌላ ተጨማሪ በሽታ ካለ ((ከታካሚው የህክምና ካርድ ላይ ይመልከቱ)	1 አለ 2የለም
14	ታካሚው ተጨማሪ በሽታ ካለበት ሰሙንና በዝርዝር የጻፉ	

15	የታወቀ የካንሰር በሽታ አለቦት? (ከካርድ ላይ የመልከቱ)	1 አለ 2 የለም
16	ማነኛውም አይነት የታወቀ ኢንፈክሽን አሎት? (ከካርድ ላይ የመልከቱ)	1 አለ 2 የለም
17	አሁን የሚወስዱት መድሃኒት አለ? (ከካርድ ላይ የመልከቱ)	1 አለ 2 የለም

18	ስንት የተለያየ መድሃኒት በቀን ውስት ወስዳሉ? (ከካርድ ላይ የመልከቱ)	
19	ባለፉት 5 አመታት ውስጥ ቀዶ ጥገና ተሰርቶሎት ወይም ተኝተው ታክመው ያውቃሉ?	1 አውቃለው 2 አላውቅም
20	ለስንት ግዜ ቀዶ ጥገና እንደተሰራሎት ወይም ተኝተው እንደታከሙ ይንገሩኝ	
ክፍል 3 ሰብጀግቲቨ ግሎባል አሰስመንት		
21	ባለፉት ስድስት ወራት ውስጥ ያጋጠመ የ ክብደት መቀነስ አለ?	1 አለ 2የለም
22	ከመታመሞ በፊት የነበሮት የሰውነት ክብደት ምን ያህል ነበር	_____

23	አሁን ያሎት የሰውነት ክብደት (እባክዎን አሁን ያለውን የ ተሳታፊውን ክብደት የለኩ)	_____
24	ከተለመደው የምግብ አወሳሰድ ለውጥ አለ ?	1 አለ 2 የለም
25	የምግብ አወሳሰድ ለውጡ ምን ያህል ነው?	1 ደካማና የምግብ ፈላጎቱ በመቀነስ ላይ ያለ 2 መካከለኛ አመጋገብ ና በመሻሻል ላይ ያለ 3 ሙሉ በሙሉ አለመመገብ
26	አሁን የሚወስዱት የምግብ አይነት	1 ጠጣርና ፈሳሽ ምግብ 2 ለስላሳ ምግቦችን 3 ፈሳሽ ምግብ ብቻ 4 አለመመገብ

27	ከሚከተሉት ምልክቶች ውስጥ ለ 2 ሳምንት እና ከዛ በላይ የቆየቦት ካልከ ይነግሩኛል	1 የምግብ ፍላጎት መቀነስ 1 አለ 2 የለም 2 ማቅለሽለሽ 1 አለ 2 የለም 3 ማስመለስ 1 አለ 2 የለም 4 ተቅማጥ 1 አለ 2 የለም
28	የለትተለት እንቅስቃሴን የማከናወን አቅም ላይ ለውጥ አለ ?	1 አለ 2 የለም

29	ለውጥ ካለ ምን አይነት ለውጥ አለ	1 ትንሽ ትንሽ መስራት 2 መንቀሳቀስ ብቻ 3 የአልጋ ቁራኛ
	የሰውነት ምርመራ	
30	የላይኛው የእጅ ጡንቻ መቀጨጭ	1 የለም 2 ተነሽ ወይም መካከለኛ 3 ከፍተኛ
31	የጡንቻ መሳሳት (የደረት አጥንት መታለጥ)	1 የለም 2 ተነሽ ወይም መካከለኛ 3 ከፍተኛ
32	.የሰውነት ወሃ መቋጠር(ወሃ አዘል ገላ)	1 የለም 2 ተነሽ ወይም መካከለኛ 3 ከፍተኛ
	ክፍል 4 የሆስፒታል ቆይታ	
33	የገቡበት ቀን (ቀን/ወር/አ.ም)	_____ / _____ / _____
34	በቆይታቸው ወቅት የተደረገላቸው ቀዶ ህክምና አለ?	1 አለ 2 የለም
35	ቀዶ ህክምናው የተደረገበት ቀን (ቀን/ወር/አ.ም)	_____ / _____ / _____
36	ከ ሆስፒታል የወጡበት ቀን (ቀን/ወር/አ.ም)	____ቄ_ / _____ / _____

ስለ ሰጡኝ ግዘ በጣም አመሰግናለው።

9.5.3 Afanoromo version questionnaire

Kutaa 1. Daataa hawaas-dimoogiraafii

lakk	Gaaffii	fiilanoo
1	Umurii deebii kennaa waggaadhaan	
2	saalaa	1, dhiira 2, dubartii
3	Amantii	1, muslimaa 2, ortodoksii 3, pirootestaantii 4, kaatolikii 5,kan biroo(ibsi) .
4	Haala gaa'elaa	1,qofa 2, kan fuudhe/te 3,abbaan/haati manaa kan irraa du'e 4, kan hiikuun/addaan bahanii
5	Sadarkaa barnootaa olaanaa	1,dubbisuu fi barreessuu dadhabuu
		2,dubbisuu fi barreessuu kan danda'u 3, sadarkaa tokkoffaa(1-8) . 4,sadarkaa lammaffaa (9-12) . 5, barnoota olaanoo 6, leenjii teeknikaa fi ogummaa

6	**Hojii** **.**	**1,Haadha manaa** **2,Qonnaan bulaa** **3,Hojjetaa Mootummaa** **4 Daldalaa** **5,Hojjetaa Guyyaa** **6,Barataa** **7,Kanneen biroo (ibsi)_ .**
7	**Bakka jireenyaa**	**1, magaalaa** **2, baadiyyaa**
8	**Seensa dura akkaataan jireenyaa keessan akkam?**	**1, Kophaa jiraachuu** **2. maatii waliin jiraachuu** **3. Warra waliin jiraachuu** **4.Kan biroo**
9	Giddugaleessaan galii ji'aa maatii	
KUTAA 2FFAA, Daataa kilinikaa		

10	**Kutaa ittii yaalamaa jiiran**	**1.kutaa medikalaa** **2. kutaa baqaqsanii hodhuu**

11	**Gareen dhukubni ijoo cisee yaalamaa jiiruuf (kaardii yaalaa dhukkubsattoota irraa ilaalaa) .**	**1.onnee fi ujummoolee dhiigaa** **2,hafuura baafannaa** **3,kan qaama saalaa fincaanii** **4,garaa fi garaachaa** **5,niwurooloojikaalaa** **6,hematology** **7,meetaabolii** **8,maashaalee lafee** **9,trauma** **10, kan biroo**
12	**Dhukubni ijoo cisee yaalamaa jiiruuf (kaardii yaalaa dhukkubsattoota irraa ilaalaa)**	**_____**
13	**Dhukubnii dabalataa jiiraa?** **(kaardii yaalaa dhukkubsattoota irraa ilaalaa)**	**1,Eeyee** **2,lakkii**
14	**Yoo eeyee jette maqaa issaa bareessii** **(kaardii yaalaa dhukkubsattoota irraa ilaalaa)**	**_____**

15	**Dhukubnii cancerii kemiiyuu jiirraa?** **(kaardii yaalaa dhukkubsattoota irraa ilaalaa)**	**1,Eeyee** **2,Lakkii**

16	**Infectioniin /hubamnii kammiyuu jiirraa?** **(kaardii yaalaa dhukkubsattoota irraa ilaalaa)**	**1,Eeyee** **2,Lakkii**
17	**Yeroo ammaa qoricha tokkollee fudhachaa jirtuu ?** **(kaardii yaalaa dhukkubsattoota irraa ilaalaa)**	**1,Eeyee** **2,Lakkii**
18	**Qoricha meeqa fudhachaa jirtuu?** **(kaardii yaalaa dhukkubsattoota irraa ilaalaa)**	___ ___
19	**Waggoota 5 darban keessatti cisanii yaalamu ykn baqaqsanii hodhuu kamiyyuu issinii godhmeeraa?**	**1,Eeyee** **2,Lakkii**
20	**Deebbin keesan yoo eeyee ta`e Yero meqaaf?**	___ ___
	Kutaa 3 Subjective global assessment	
21	**Ji'oota 6 darban keessatti ulfaatina qaamaa hir'istenittuu?**	**1,Eeyee** **2,Lakkii**

22	Ulfaatinni kee kan barame dhukkuba kanaan dura meeqa ture?	

23	Ulfaatina ammaa (safarrii) .	
24	Dhukkuba kanaan booda nyaata fudhattan irratti jijjiiramni ni jiraa?	**1,Eeyee** **2,Lakkii**
25	Yoo eeyyee ta'e, Jijjiiramni fudhatama nyaataa akkamii jira	**1,gaddi bu`a fi hir'achaa dhufeera** **2, giddu galessa fi fooyya'aa jira** **3, beela'uu ykn nyaachuu dadhabuu**
26	Gosa nyaataa akkamii yeroo ammaa fudhachaa jirtu	**1,jajjaboo fi dhangala'aa** **2,walakkaa dhangala'aa** **3, nyaata dhangala'aa qoofa** **4.gonkumaa nyaata hinfudhenee**
27	Mallattoolee kana keessaa tokkolee torban lamaa ol kan itti fufee ni qabduu	**1,feedhii nyaataa dhabu 1,eeyee 2,lakki** **2, ol nama jechuu 1,eeyee 2,lakki** **3,ol deebisuu 1,eeyee 2,lakki** **4,garaa kaasaa 1,eeyee 2,lakki**
28	Is there any change in your functional ability	

		1,eeyee **2,lakki**
29	Gosti jijjiirama dandeettii hojii kee maali	1,amma tae hojachuu 2,Kan socha`u danda`u 3,Siree irra kan jiru
	Qormaata qaamaa	
30	**Copha SC (triceps) dhabuu .** **Yaada** **Tokkollee hin jiru (Quba hin tuqne)** **Gadi aanaa hanga giddu galeessaa (Quba wal arguutti dhihaate) Hamaa (Quba tuttuqaa) .**	1,tokkollee hin jiru 2,gadi aanaa hanga giddu galeessa 3,cimaa dha

31	**hirachuu maashaalee (naannoo qaama clavicle) .** **Yaada** **Maashaa dhabuun kan hin dhiyaanne; kan mul'atu, garuu dubartoota irratti kan mul'atudha** **(Gadi aanaa hanga giddu galeessaa)** **Dhiirota irratti: kutaan qaama (clavicle) ni mul'ata Dubartoota keessatti: klaavikiliin mul'ata deltoid yoo ta'u maashaan garaa ammallee hin tuqamne**	1,tokkollee hin jiru 2,gadi aanaa hanga giddu galeessa 3,cimaa dha
	(Hammaataa) Ba'ee mul'atu	
32	**Edema /dhiitoo** **Yaada** **Edema salphaa.... naannoo gara fiixee gadii (Ankle, pedal, tibial) .** **Edema cimaa.....edema waliigalaa**	1.edema/dhittoon hinjiiruu 2, edema/dhitoo salphaa 3, edema/dhitoo cimaa
	Kutaa 4ffaa,dheerina turtii	
33	**Guuyaa ittin galan dd/mm/yy**	___ ___/___ ___/___ ___ ___ ___

34	**baqaqsanii hodhuu kamiyyuu issinii hojatamera**	1,Eeyee 2,Lakkii
35	**Guyyaa adeemsa baqaqsanii hodhuu**	___ ___/___ ___/___ ___ ___ ___
36	**Guyyaa itti hospitaalaa bahaan**	___ ___/ ___ ___/ ___ ___ ___ ___

HIRMAANNAA FI YEROO KEESSANIIF GALATOOMAA

9.6 CURRICULUM VITALE (CV)

1. **Personal Information**

Name: Hayat Ahmed Seid

Sex: Female

Age: 26

Date of birth: - June 15 , 1990 E.C.

Place of birth: Harar ,town

Religion:- Muslim

Marital status:-single

Nationality: Ethiopian

Health status: no known illness

Current address:A.A, Ethiopia

Mob: +2519-34864644/+251915746425

Email: hayatas760@gmail.com

2. **Educational background and award**

No	***School (University)***	***Year***	***Award***
1	Betelhem chatholic primary school,Harar	1997-2002	Certificate

2	St.joseph chatholic school ,Adama	2003-2008	Diploma
3	Arsi University, College of Health science.	2009-2012/13	BSC Degree
4	Haramaya university	Ongoing	Masters Degree

3. **Language proficiency**

No	***Language***	***Speaking***	***Reading***	***Listening***	***Writing***
1	English	Excellent	Excellent	Excellent	Excellent
2	Amharic	Excellent	Excellent	Excellent	Excellent
3	AfanOromo	Excellent	Excellent	Excellent	Excellent

- **BSC Degree in Public Health, on February, 2013 E.C.**
- **I am certified by Public Heath with Major GPA 3.38*Cumulative GPA of 3 .29***
- **Currently second year student at haramaya university collage of health and medical science with the department MPH in Nutrition**

5. Work Experience

- **For five Months Externship at Bokoji hospital..**
- **six months internship at adama health center**

- **one and half year contract work as a research assisstant in Ethiopian Public Health institute on National Food and Nutrition survey in A.A and oromia region**
- **2 months project on double fortification of salt in Oromia region.**
- **worked on MCH e cohort study for 4 months using CAPI at Ethiopian public health institute Health system department**

- **worked at Armaur Hansen research institute as aresearch assistant on early childhood development base line survey.**
- **Excellent ability of communication skills, working in groups and excellent team leading skills like**

6. Computer literacy

❖ **Good internet and browsing skill**

❖ **Proficient in Microsoft office &**

Experience in electronic data collection like ODK ,RED cap and analysis tools like SPSS,STATA e.t.c

7. Hobbies and Interest

❖ **Reading psychological books, Journals, magazines, newspaper, fiction and watching educational movies.**