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Prevalance of Under Nutrtion and Associated Factors Among Elective Surgical Patients Addmitted at Tibebe Ghion Specialized Hospital Bahir Dar, Ethiopia 2014

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BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

Prevalance of Under Nutrtion and Associated Factors Among Elective Surgical Patients Addmitted at Tibebe Ghion Specialized Hospital Bahir Dar, Ethiopia 2014

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ATHESIS SUBMITTED TO BAHIR DAR UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCES, DEPARTEMENT OF SURGERY FOR THE PARTIAL FULLFILMENT OF THE REQUIREMENTS FOR THE CERTIFICATE IN SURGER

March, 2022

Bahir Dar, Ethiopia

APPROVAL SHEET

BAHIR DAR UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCES, DEPARTMENT OF SURGERY

I, the under signed general surgery resident, declare that I have submitted my original work on prevalence of under nutrition and associated factor among admitted elective surgical patient to surgical ward in Tibebe Ghion specialized hospital, Bahr Dar, Ethiopia, 2022 for the examination.

Submitted by: Dr Tesfaye Hailu (email:Tesfayehailu87@gmail.com phone: 0922781087)

Signature _____

Date _____

This thesis work has been submitted for examination with my approval as an advisor.
Approved by: Advisors: 1. Dr Destaw Biaydege

Signature _____

Date _____

2. Zelalem Alamrew

Signature_____

Date _____

This thesis prepared by Dr Tesfaye Hailu is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of speciality in surgery.

Internal examiner: Signature_____ Date _____

External examiner: Signature _____ Date _____

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ACRONYMS AND ABBREVIATIONS

AOR	Adjusted Odds Ratio
ASPEN	American Society for Parenteral and Enteral Nutrition
BMI	Body Mass Index
CI	Confidence Interval
COR	Crude odd ration
G/dl	Gram per deciliter
Ht	Height
IDF	International Diabetes Foundation
IHRERC	Institutional Health Research Ethics Review Committee
KG	Kilogram
Kg/m2	Kilogram per Millimeter Cube
LOS	Length of Hospital Stays
MRN	Medical Record Number
NG	Nasogastric
NS	Nutritional Status
PG-SGA	Patient Generated Subjective Global Assessment
SD	Standard Deviation
SPSS	Statistical Package for Social Science
SSI	Surgical Site Infection
TGSH	Tibebe Ghion Specialize Hospital
WHO	World Health Organization
W	Weight

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Abstract

Background: Under nutrition in surgical patients is found to be associated with reduced wound healing, increased complication rates, length of hospital stay, mortality, and healthcare costs than normally nourished patients. Several malnutrition cases have been reported from the routine care in the hospital. However, there is no study conducted in the study area.

Objective: To assess the Prevalence of malnutrition and associated factor among elective surgical patient at TGSH Bahir Dar Ethiopia 2022

Methods: Hospital based cross sectional study was conducted among 328 consecutively admitted Elective surgical patients in TGSH Hospital from January 2022-August 2022 G.C. Data was collected using pre tested structured questionnaire. Anthropometric measurements and post-operative outcome assessment were made at admission and discharge of the patient. Data were entered and analyzed Using SPSS version 2021 software. Descriptive studies such as frequencies, percentages, mean and quantitative measure was done. Binary logistic regression was used to explore prevalence of under nutrition in elective surgical patient and associated factor. Result was presented using AOR with its 95% confidence level and P-values < 0.05 were declared statically significant.

Results: A total of 122(37.2%) study participants were underweight at admission. Patients with Urban residence (AOR= 0.395; 95%: CI 0.221, 0.78), no previous operation (AOR=0.214; 95% CI 0.093, 0.492) patients with no comorbidities (AOR= 0.241; 95 CI: 0.105, 0.556), those with no surgical site infection and participants with length of hospital stay <= 7days (AOR=0.370; 95% CI 0.209-0.657) were factors less likely to be undernourished at admission.

Conclusion: In the current study under nutrition is highly prevalent among surgical patients. Rural residence, previous operation and underlying comorbidities were common factors associated with under nutrition at admission and discharge. In addition, surgical site infection and length of hospital stay were identified factors at time of discharge. In patient with under nutrition the incidence of surgical site infection, length of hospital stay and comorbidities increases in comparison to those with no under-nutrition. The overall mortality found in this study was relatively higher compared with some studies in Ethiopia even if it is lower in some areas.

Keywords: Malnutrition, prevalence, associated factor, Hospital

1. INTRODUCTION

1.1. Background

The term “malnutrition” is a broad term used to describe any imbalance in the diet, ranging from over nutrition to under nutrition. According to the Declaration of ENHA of June 2009, it was confirmed that malnutrition is an urgent health problem throughout Europe [1].

Under nutrition is associated with many adverse clinical outcomes, including longer length of stay, increased morbidity and mortality, and increased hospital costs. Although measurement of malnutrition varied depending on the hospital setting and method of nutritional assessment, its prevalence in hospitals was reported to range from 20% to 50%**.** Therefore, the recognition of under nutrition and early nutritional therapy in hospitalized patients is important along with the treatment of underlying diseases [2].

The reasons for which under nutrition may develop are different: scarce food intake, increased requirements related to the stage of a disease, complications of the primary disease expressed in reduced absorption or excessive loss of nutrients, or a combination of all. Loss on cellular, physical and physiological level occurs as a consequence of malnutrition. This loss is determined by the age of the patient, type, severity and duration of illness, and the current nutritional intake [1].

In developed nations the main cause of malnutrition is disease states. This is a particular interest to the surgeon as chronic and acute disorders may differentially alter metabolism, appetite, absorption and utilization of nutrients. Several chemical mediators such as interleukin-1, interleukin-6, tumor necrosis factor alpha and glucocorticoids are known to have catabolic effects and these stress hormones are found to be elevated in many chronic disease states such as malignancy[3].

Malnutrition remains under-diagnosed in 70% of patients in the hospital setting. Furthermore, no studies have distinguished acute from elective surgical patients. Malnutrition at admission has prognostic significance however this influence is different for disease processes that are sudden and acute versus those that are chronic and longstanding. Acute surgical patients often present with markedly different clinical problems compared to elective patients, and the pathologies facing clinicians in these groups of patients require distinctly different approaches to

management based on acuity, the metabolic response to injury and the state of metabolic stress [3].

As the cause of malnutrition in surgical disease is multi-factorial, with decreased intake and increased metabolism being central, early diagnosis and tailored intervention is needed. Surgery in itself, like any injury, results in release of inflammatory mediators with resultant catabolism of stores [3].

Malnutrition in patients undergoing surgery may have serious consequences. Importantly, malnutrition is associated with poor wound healing and increased risk of surgical and non-surgical organ complications. Infectious and non-infectious complications are increased. Malnutrition also leads to prolonged length of hospital stay (LOS) and higher nosocomial infection rates. The end result is slowed functional recovery and increased cost of care [3].

Studies show that in surgical practice there is malnutrition in 50% of patients and that there is a connection between the nutrition and surgical result surgical patients are a heterogeneous population, with differences in primary diseases.

Although differences exist separate in all patients, there is a similar response to stress from the surgical intervention which is represented with a complex of serial reactions involving the endocrine and inflammatory system. These reactions play an important role in the development of metabolic changes and in the development of postoperative complications [1].

The assessment of a nutritional status is of particular importance because it affects the postoperative clinical results. The early recognition of malnutrition enables planning of nutrition therapy, prevention of inadequate nutritional status, as well as its cessation or correction so that the postoperative complications can be avoided [1].

Malnutrition may affect all three phases; inflammation, proliferative, and re-modeling of the wound-healing process due to vitamin and mineral deficiencies. Patients with malnutrition are at a higher risk for infection, organ failure, decreased wound healing, and suboptimal response to regular medical treatment [4].

1.2. Statement of the problem

Malnutrition is a frequent concomitant of surgical illness. Studies have reported 40%-50% of surgical patients to be malnourished on admission to hospital

Studies reported that up to 40% of patients were malnourished at the time of their admission and the majority of these patients continued to be nutritionally depleted throughout their hospital course. In general, surgery- related causes of malnutrition are hyper catabolism, postoperative fasting, prolonged ileus, fistula, malabsorption syndrome, intestinal obstruction, and gastric a tony. Malnutrition in hospitalized patients often goes unrecognized[5].

Malnutrition has long been recognized as a risk factor for postoperative morbidity and mortality; with an estimated threefold increase in associated hospital system costs. However, the true prevalence of malnutrition has been difficult to characterize owing to the lack of a standardized definition[6].

Nutritional problems in older adults often remain undetected or unaddressed, likely due to poor knowledge of malnutrition among medical staff. In recent decades, efforts have been made to incorporate teaching on nutrition into the undergraduate and postgraduate medical curricula to address this gap. Recognition and treatment of malnutrition remain the responsibility of every perioperative clinician when preparing and optimizing patients for surgery. Nutritional screening, assessment, and prompt treatment of deficits before surgery must be emphasized[7]**.**

The extent to which perioperative clinicians include screening for malnutrition and pathways for the nutritional assessment and management of patients identified as at risk is unclear.

Perioperative physicians recognize malnutrition as an important issue, yet formal screening processes are observed in only 6–38% of surgical sites. Informal screening procedures often fail to recognize malnutrition, possibly because clinicians erroneously pursue the phenotypic

expression of Malnutrition only[7].

Historically, malnutrition has been identified in surgical patients through the use of laboratory values, such as serum albumin and pre-albumin or anthropometric measurements, such as body weight or body mass index (BMI). Many commonly used nutritional screening tools are based on some combination of these measures. Although these markers are quantitative, objective, and

easily abstracted, their validity as measures of nutritional status and impact on perioperative risk is unclear[8].

Although it is evident that preoperative malnutrition is a considerable preoperative risk for patients undergoing surgery, the relationships between nutritional practices during the perioperative period and clinical outcomes among this patient group are less well established [9].

In the current trajectory of perioperative care, the preoperative clinic remains a logical place for further nutritional assessment of patients identified to be at risk of malnutrition and to plan appropriate intervention[7].

A concept of nutritional pre-habilitation is emerging in perioperative medicine in view of the Potential impact of high-quality nutrition on postoperative outcome [7].

1.3. Objectives

1.3.1. General objective

To assess the prevalence and associated factor of malnutrition among elective surgical patients at TGSH, Bahir Dar, Ethiopia 2022.

1.3.2. Specific Objectives

To determine the prevalence of malnutrition in elective surgical patient at TGSH, Bahir Dar, Ethiopia 2022.

To identify associated factor with malnutrition in elective surgical patient at TGSH, Bahir Dar, Ethiopia 2022.

1.4. Significances of the study

The result of this study may provide epidemiological and clinical information that was serving as an essential input for policy makers to design proper strategies to address malnutrition in surgical patient. Moreover the study result was serving as references for those who want to undertake research on prevalence of malnutrition and postoperative outcome.

The study may provide basis for improvement of treatment outcome of these patient by preoperative screening and early intervention.

1.5. Operational definitions

- **Length of hospital stay:-** is measured in days, from the day of admission to hospital to the time of discharge or death
- **Malnutrition**: - can apply to various states; under nutrition, over-nutrition or deficiencies of specific nutrients. In this study the term malnutrition refers to under nutrition
- **Subjective Global Assessment (PG-SGA) form: -** It comprises of four medical components; weight loss, condition, metabolic stress and physical examination. For each component, points are awarded depending on the impact of the symptom on nutritional status. The PG-SGA then provides a global rating scale of three nutrition levels; SGA A: nourished, SGA B: moderately or suspected of being malnourished, or SGA C: severely malnourished.

2. LITERATURE REVIEW

There is no universally accepted definition for malnutrition; however, commonalities among definitions include an ‘unbalanced nutritional state’ that leads to ‘alterations in body composition’ and ‘diminished function. An unbalanced nutritional state refers to both over- and under nutrition. Patients who suffer from over nutrition consume excess energy, and patients who suffer from under nutrition consume too few nutrients, including energy and protein. The ‘body composition’ term refers to anthropometric changes in total body and lean mass, whereas ‘function’, which most commonly refers to physical function, also encompasses cognitive and immune function[8].

In the Western world, under nutrition is seldom the exclusive result of a deficient nutrient intake, and thus definitions for malnutrition often additionally including an etiology-based diagnosis for under nutrition? A definition of malnutrition for the undernourished surgical patient might thus be ‘a nutritional state in which nutrient intake does not match nutrient needs – due to underlying disease (s), the surgical stress response, chronic or acute inflammation, intestinal malabsorption (e.g. diarrhea) and/ or patient-related factors (e.g. socio-economic status) – leading to losses in lean tissue and diminished function[8].

Under nutrition has long been recognized as a risk factor for postoperative morbidity and mortality; with an estimated threefold increase in associated hospital system costs. However, the true prevalence of malnutrition has been difficult to characterize owing to the lack of a standardized definition [6].

Under nutrition patients have higher morbidity and mortality rates than normally nourished patients, with longer hospital admissions and increased health care cost. In a study conducted in Singapore found that magnitude malnutrition at admission was 29%; malnourished patients had longer hospital stays (6.9 ±7.3 days vs. 4.6 ± 5.6 days) and were more likely to be readmitted within 15 days[10].

In another study report from German found a 27% rate of under nutrition among hospitalized patients. Under nutrition patients having a LOS 43% longer than well-nourished patient’s. In one study conducted in Ethiopia among adult hospitalized patients the prevalence of malnutrition was 55.6%[11].

Under nutrition is also found additionally associated with reduced wound healing and increased complication rates. Lack of appropriate nutritional support during hospitalization may worsen patients' nutritional status and increases risk for infection, organ failure and suboptimal response to regular medical treatment[12].

Under nutrition is a major public health problem that is under recognized, undertreated, worsens in hospitals, and common throughout in the world. The nutritional status of a patient during hospital admission influences the outcome of the patient, and nutritional intervention during hospital stay improves the outcomes of surgery [13].

Undernourished surgical patients have complication and mortality rates 3 to 4 times higher than normally nourished patients with longer hospital admissions, incurring up to 50% greater costs. It is often difficult to separate the deleterious effects of under nutrition from the underlying disease process itself, especially because each can be a cause or consequence of the other [14].

Under nutrition in patients undergoing surgery may have serious consequences. Importantly, under nutrition is associated with poor wound healing and increased risk of surgical and non-surgical organ complications. Infectious and non-infectious complications are increased. Under nutrition also leads to prolonged length of hospital stay (LOS) and higher nosocomial infection rates. The end result is slowed functional recovery and increased cost of care [3].

Although a number of studies have assessed the prevalence of under nutrition in general surgical patients, there is little information to distinguish these patients and its consequences in Ethiopia. The aim of the present study was to investigate the prevalence of under nutrition in elective surgical patients and its associated effect.

2.1. CONCEPTUAL FRAME WORK

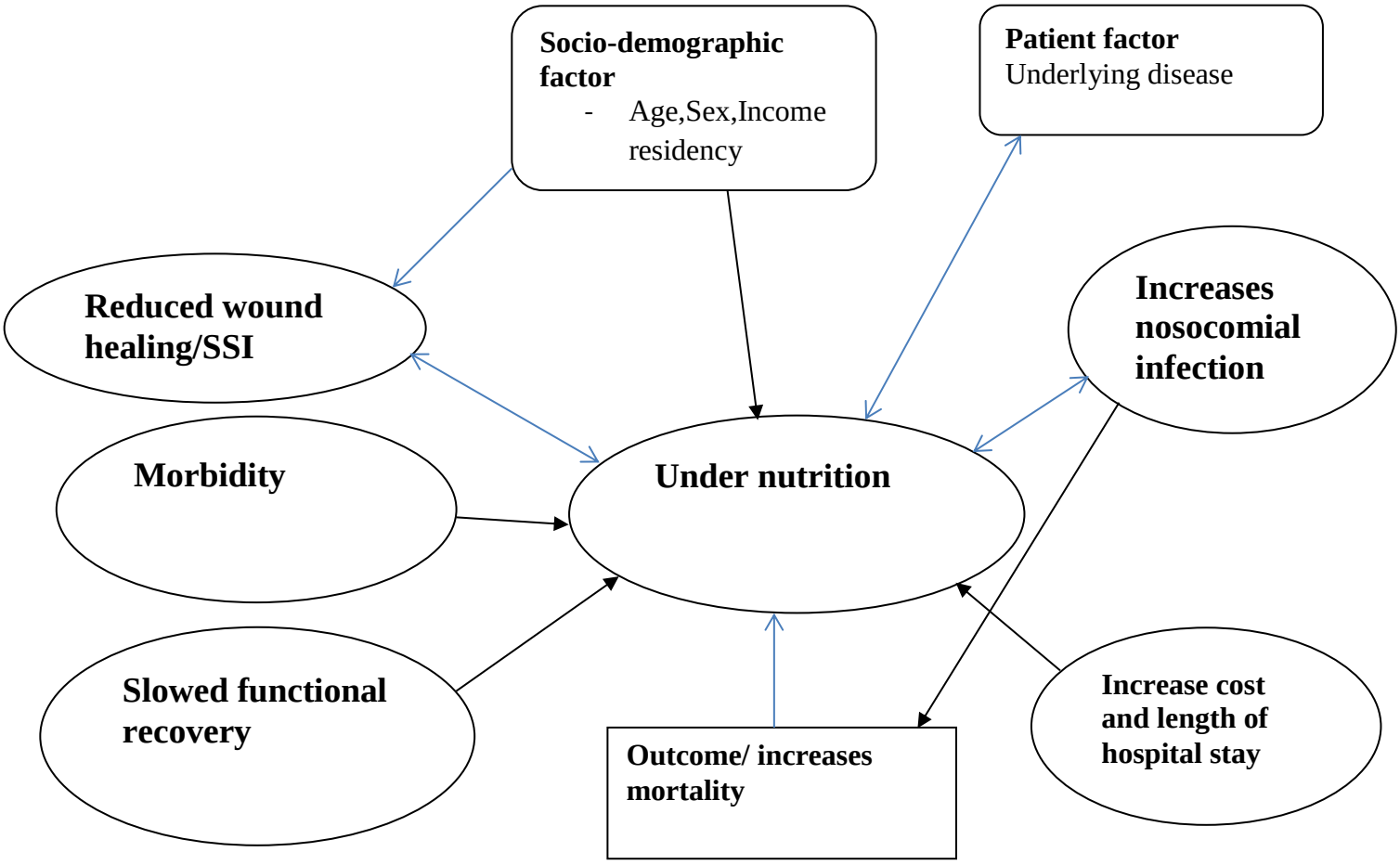

Figure1. Conceptual frame work on Prevalence of malnutrition in elective surgical patient and associated factor at TGSH Bahir Dar Ethiopia 2022

3. METHODS AND MATERIALS

3.1 Study area and Period

The study was conducted from January 2022-August 2022 G.C in TGSH department of surgery, which is located in Bahir Dar town, north western Ethiopia. Bahir Dar town is found at 545 Km to the north west of Addis Ababa. The hospital located around Sebatamit and has been provided health care service for more than 5,400,000 populations in its catchment area in the north western part of Ethiopia. It has 11 departments and has 460 beds. The surgical department has 100 beds and has been giving both major and minor surgical services.

3.2 Study design

A hospital based cross-sectional study design was employed. The first part of the study involved a retrospective audit of the medical histories of all patients who met the selection criteria and were admitted during the study period.

The second part of the study involved the additional assessment of a subset of patients and included preoperative nutritional status and post-operative nutritional intake

3.3. Population

3.3.1 Source of population

All adult patient who was undergoing elective surgery admitted for greater than 24hr under the general surgical services in the elective settings in TGSH over an 8-month.

All those eligible were approached within 24hr at admission and enrolled into the study after verbal consent was given.

3.3.2 Source of data

The first part of the study involved a retrospective audit of the medical histories of all patients who met the selection criteria and were admitted during the study period.

The second part of the study involved the additional assessment of a subset of patients and included preoperative nutritional status and post-operative nutritional intake

3.4. Inclusion and Exclusion Criteria

3.4.1 Inclusion Criteria

- All elective surgical patients admitted during study period, age > or = 18 years, and complete medical history

3.4.2 Exclusion criteria

- Pregnant mother and those who are severely debilitated and non-ambulatory

3.5. Sample size determination and Sampling techniques

The sample size is determined using a single proportion population formula based on previous study conducted in Tigray region , where proportion of malnutrition among surgical patients was 31% [14].

$$n = \frac{(z_{\alpha/2})^2 \cdot pq}{d^2}$$

.

Where n=Initial minimum sample size; Zα/2=Z value at 95% CI [1.96]; p= the expected prevalence rate is 31%; d=Margin of error tolerable is 5% [0.05].

P= 31%

q=1-p

Zα/2 = 1.96 CI=95%, α=0.05

d = 0.05

n=1.96*1.96*.31*.69/0.05*0.05=328

The final Sample size was allocated proportionally based on average number of patients admitted to surgical ward. Then all consecutive eligible patients were included until the final sample size reached.

3.6. Data collection tools

- Data was collected by the following methods

A. Face to face interview: was made by final year medical students as data collectors using pre-tested structured questionnaire which was prepared by reviewing related literatures (Nutrition Assessment Forms & Questionnaires).

The questionnaire was used to collect data on socio-demographic information such as age, occupation, education and income. In addition, clinical information from patient records such as current type of disease diagnosed and comorbidity, duration of current disease, previous history of surgery, complications after surgery and type of surgery was reviewed. After completion of the above data collection process during admission, study participants were followed till discharged from the hospital.

B. Nutritional status assessments: were conducted at the time of admission.

Weight (W) of patients was measured using a scale with a maximum capacity of 150 kg and accuracy of 0.1 kg. Weighing scale was checked for correctness after each patient measured. Height (H) will be measured in standing position in stadiometer.

3.7. Study variables

3.7.1. Dependent study variable

Under nutrition (Yes/no)

3.7.2 Independent Study variable

- Socio-demographic variable:-Age, sex, income, dietary habit
- History of previous operation
- Length of hospital stay
- Surgical site infection
- Co-morbidity

3.8. Data quality management

Standardized and Properly designed data collection tool was modified and prepared. A two days theoretical and practical training was given to these employees before the actual data collection takes place. The questionnaire was pre-tested on Felege Hiwot Referral Hospital which was not selected for the study that was the questionnaires would be pretested on 5% of study sample subjects in TGSH.

Questionnaire was checked for completeness on a daily basis by immediate supervisors. Principal investigator would do close supervision to overcome any mistakes from data collectors. After checking all questionnaires for consistency and completeness the supervisors were submitted the filled questionnaire to the principal investigator. Incorrectly filled or missed records were sent back to the respective data collector for correction.

To cross check the collected data and maintain the quality of data, the principal investigator was rechecking all the completed questionnaires daily. Data was checked for its completeness, coded, edited, cleaned, properly organized and analyzed. A day to day on site supervision was carried out during the entire period of data collection by principal investigator. At the end of each day, the questionnaires was checked for completeness, accuracy and consistency by investigator and corrective discussions was undertaken with all the data collectors.

3.9. Data processing and Analysis

Data was coded and entered using Epi Data software version 3.1 and transferred to SPSS version 25 software packages for analysis. A descriptive analysis of the patients was done by calculating mean, standard deviation and proportion of the studied variables. Dichotomous variables were expressed as percentages. The chi-square test was used to compare the proportions. Bivariate and multivariate logistic regression analysis was performed to assess factors associated with nutritional status at time of admission and discharge.

Variables with p value less than 0.25 were considered for Multivariate analysis. Those variables with p value less than 0.05 in multivariate analysis were considered as significantly associated factor.

Body Mass Index (BMI) (kg/m2) was calculated by dividing the weight by the square of the height (kg/m2). It was classified according to the World Health Organization criteria (WHO) (14) for adults, BMI <18.5 kg/m2 = Underweight; 18.5 kg/m2 ≤ BMI ≤ 24.9 kg/m2 = Normal; 25 kg/m2 ≤ BMI ≤ 29.9 kg/m2 =Overweight; BMI ≥ 30 kg/m2 = Obese.

3.10. Result Dissemination Plan

After the data was analyzed, the results of the research were presented to Bahir Dar University College of medicine and health sciences, department of surgery. The findings will be published in a relevant scientific journal and disseminated online so that they can be of use for other academic researchers and clinical practitioners. It will also present on different conferences, and professional society meetings like Ethiopian Society of surgery. The data can also serve as a base line for future studies.

3.11. Ethical Considerations

Ethical clearance was obtained from Research and Ethical Committee of Bahir Dar University College of medicine and health sciences, department of surgery. Official letter of permission from the college was submitted to Bahir Dar University College of medicine and health sciences. A formal letter was also submitted to all concerned bodies to obtain their co-operation. Confidentiality was secured by avoiding writing the patient's name and the data will not give for the third person.

4. Results

4.1. Socio-demographic characteristics

A total of 328 study participants were included in this study with response rate of 100% and 151(46%) of them were in the range of 40-59 years. most of the study participants were female 171(52.1%) and rural resident 196(59.8%).one hundred twelve (34.1%) and 100(30.5%) of the participant were unable to read write in educational status and farmers in their occupational status, respectively. Majority (41.8%) of the participants earn between 3001-5000 birr per month (table 1).

Table1. Socio-demographic characteristics of elective surgical patients admitted in TGSH 2022

Characteristics		Frequency	Percent
Age	18-39	115	35.1%
	40-59	151	46%
	>= 60	62	18.9%
Residency	urban	132	40.2%
	Rural	196	59.8%
Marital status	Single	68	20.7%
	Married	192	58.5%
	Separated	44	13.4%
	Widowed	24	7.3%
Educational status	Uneducated	112	34.1%
	Elementary	79	24.1%
	Secondary	72	22%
	College	65	19.8%
Occupational status	Housewife	70	21.3%
	Farmer	100	30.5%
	Daily laborer	32	9.8%
	Merchant	53	22%
	Employer	73	19.8%
Income per-month	1-1000	3	0.9%
	1001-3000	70	21.3%
	3001-5000	137	41.8%
	>5000	110	33.5%
	No income	8	2.4%

4.2 Clinical parameters of elective surgical patient admitted at TGSH 2022

Most of the study participants 216(65.9%) were admitted for gastro-intestinal problems. A greater number of patients in the elective group had lower gastrointestinal, non-infective breast and endocrine pathologies. Only 46(14%) of participants had previous history of surgery and the majority was 43(13.1) laparotomy. forty-seven (14.3%) of study participants had co-morbidities other than the current disease they admitted. Diabetes mellitus was the commonest co-morbidity followed by respiratory illness. From admitted elective surgical patient for only 67(20.4%) of the patient albumin was done and from these 52(15.9%) of them were hypo-albuminemia. The incidence of surgical site infection in the admitted elective surgical patient was 70 (21.3%) and from those who develop SSI majority of them develops 59(18%) superficial surgical site infection and 90% while they are in hospital set-up. The majority of study participant 194 (59.1%) were stays at hospital for 1-7 days. only 3(0.9) patients was develops edema. A total of 314 (95.7%) and 14(4.3%) of the study participant were a live and death at the time of discharge, respectively (table 2).

Table2.clinical characteristics of elective surgical patient admitted at TGSH 2022

Characteristic		Frequency	Percent
History of previous surgery	Yes	46	14%
	No	282	86%
Co-morbidity	Yes	48	14.4%
	No	280	85.6%
Type of co-morbidities	Respiratory illness	12	3.7%
	Cardiac illness	11	3.4%
	DM	14	4.3%
	HTN	6	1.8%
	Other	5	1.5%
Length of hospital stay	1-7 days	194	59.1%
	>7 days	134	40.9%
Current disease of the patient admitted	Digestive tract disease	216	65.9%
	Head and neck problem	70	21.3%
	Breast problem	19	5.8%
	Other	23	5.8%
Edema	Yes	3	0.9%
	No	325	99.1%
Final outcome	Alive	314	95.7%
	Death	14	4.3%
Surgical site infection(SSI)	Yes	70	21.3%
	No	258	78.7%
Type of SSI	Superficial SSI	59	18%
	Deep SSI	8	2.4%
	Organ space SSI	1	0.3%

4.3 prevalence of under nutrition in elective surgical patients admitted in TGSH 2022

From 328 admitted patients 122(37.2%) were under-nutrition at the time of admission.

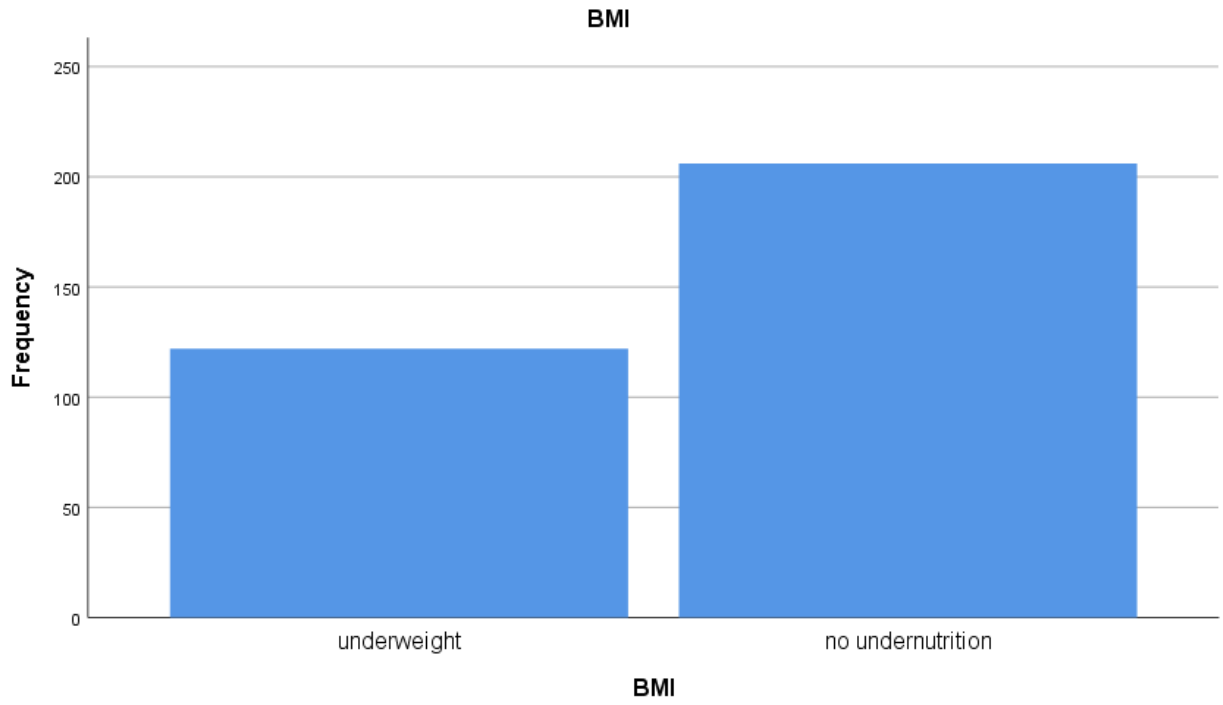

Figure2. Prevalence of malnutrition in elective surgical patient in TGSH 2022

4.4 Factors affecting under nutrition among elective surgical patient admitted at TGSH 2022

In bivariate logistic regression the hospital were patients admitted, residence, previous operation, comorbidities, were significantly associated with under nutrition during admission($p<0.05$).However, in multivariate logistic regression analysis residence, previous operation, comorbidities, surgical site infection, length of hospital stay and final outcome were factors associated with under nutrition during discharge.

Urban residency were 59.9% (AOR=0.401 95% CI 0.247-0.65) less likely to be undernourished compare to rural residency. Patient who don't have underlying comorbidities at the time of admission 75.9% (AOR=0.241 95% CI 0.105-0.556) less likely to develop under nutrition than those with comorbidities. Those patients who don't develop surgical site infection (AOR=0.194; 95% CI 0.099-0.380) less likely they are undernourished than those who develop SSI. When we compare the length of hospital stay (AOR=0.370; 95% CI 0.209-0.657) decrease in those not undernourished patients. Those patients who haven't previous operation (AOR=0.214; 95% CI 0.093-0.492) less likely to develop under nutrition.

Table 3.Factors associated with under nutrition among elective surgical patients admitted in TGSH 2022

Variable		BMI		COR at 95%CI	A0R at 95% CI	P-value
		No under nutrition	Under N			
Sex	Male	85(54.1%)	72(45.9	0.488(0.309-0.76)		
	Female	121(70.8%)	50(29.2%)			
SSI	YES	19(27.1%)	51(72.9%)	1		
	NO	187(72.5%)	71(27.5%)	0.141(0.078-0.256)	0.194(0.099-0.380)	0.0001
LOHS	1-7 days	148(76.3%)	46(23.7%)	0.237(0.147-0.382)	0.370(0.209-0.657)	0.0001

	>7days	58(43.3%)	76(56.7%)	1		
Comorbidities	Yes	11(23.4%)	36(76.6%)	1		
	No	195(69.4%)	86(30.6%)	0.135(0.66-0.277)	0.241(0.105-0.556)	0.0001
Age	18-39	72(62.6%)	43(37.4%)	0.827(0.44-1.553)		
	40-59	98(64.9%)	53(35.1%)	0.749(0.409-1.371)		
	>=60	36(58.1%)	26(41.9%)	1		
Address	Urban	99(75.0%)	33(25.0%)	0.401(0.247-0.65)	0.395(0.221-0.78)	0.002
	Rural	107(54.6%)	89(45.4%)	1		
Education	Uneducated	66(58.9%)	46(41.1%)	1		
	Elementary	40(50.6%)	39(49.4%)	1.399(0.783-2.499)		
	Secondary	50(69.4%)	22(30.6%)	0.631(0.337-1.182)		
	College	50(76.9%)	15(23.1%)	0.43(0.216-0.857)		
Occupation	Housewife	47(67.1%)	23(32.9%)	1		
	Farmer	58(58.0%)	42(42.0%)	1.48(0.782-2.799)		
	Daily laborer	20(62.5%)	12(37.5%)	1.22(0.512-2.933)		
	Merchant	31(58.5%)	22(41.5%)	1.45(0.692-3.039)		
	Employer	50(68.5%)	23(31.5%)	0.940(0.466-1.896)		
Marital	Single	35(51.5%)	33(48.5%)	0.673(0.263-		

				1.725)		
	Married	70(70.8%)	56(29.2%)	0.294(0.123-0.701)		
	Separated	25(56.8%)	19(43.2%)	0.543(0.198-1.486)		
	Widowed	10(41.7%)	14(58.3%)	1		
Pre-opera	Yes	11(23.9%)	35(76.1%)	1		
	No	195(69.1%)	87(30.9%)	0.140(0.608-0.289)	0.214(0.093-0.492)	0.0001
Diagnosis	Digestive tract problem	120(58.3%)	96(78.7%)	1		
	Head and neck	52(25.5%)	18(14.8%)	0.433(0.238-0.788)		
	Breast	16(7.8%)	3(2.5%)	0.234(0.066-0.828)		
	Other	18(8.7%)	5(4.1%)	0.347(0.124-0.969)		

4. DISCUSSION AND IMPLICATION

The proposed institutional-based cross-sectional study attempts to assess the prevalence of under nutrition and its associated factors among adult elective surgical patients and revealed that the overall prevalence of under nutrition was 37.2%. Rural residence and having comorbidities were factors associated with underweight/under nutrition at the time of admission.

The reported prevalence of poor nutritional status has varied widely in studies, in part because of different populations and types of institutions studied, and because of different diagnostic criteria or tools used to define nutritional status.

The purpose of nutritional screening is to rapidly identify patients who are at high nutritional risk or have poor nutritional status at hospital admission. Information is collected on the patient's change in weight, body mass index or weight history, the adequacy of food intake and, with some tools, the severity of disease[15].

One of the problems with both nutritional screening and assessment is that disease and nutritional status interact. Conditions associated with chronic disease, such as anorexia and asthenia, will result in poor food intake, and ultimately protein-energy malnutrition. The malnutrition may increase gastrointestinal dysfunction, cause infection and impair wound healing, which can lead to worse food intake and malnutrition. Many acute events, such as sepsis and pneumonia, may lead to hyper-metabolism and severe inflammatory response, and ultimately stress-induced catabolism. Stress-induced catabolism may also cause gastrointestinal dysfunction, infection and impaired wound healing, which can lead to decreased food intake and protein-energy malnutrition. Thus, both chronic and acute conditions can synergistically interact with a patient's nutritional status and lead to progressive malnutrition and prolonged hospital stay[4].

Magnitude of under nutrition in elective surgical patients is important because it may predict post-operative outcome and higher risk of morbidity and mortality. The presence of under nutrition is a predictor of worse outcome in elective surgical patients [16].

Under nutrition is frequent concomitant of surgical illness. A study reported that up to 40% of the patients were malnourished at the time of their admission and the majority of these patients continued to be depleted throughout their hospital course[1] . Similarly in the current study the magnitude of under nutrition was 37.2%.In a study conducted in Singapore found that magnitude malnutrition at admission was 29%; malnourished patients had longer hospital stays (6.9 ±7.3 days vs. 4.6 ± 5.6 days) and were more likely to be readmitted within 15 days [10]. This was higher to study conducted from Brazil (22.2%) [4] and China (17.8%) [7].This was higher than another study conducted in Brazil (14.1%) [17]. However, it is lower than similar study from Ethiopia (55.6%) [9] and pre-operative patients report from Albania (65.3%).

In another study report from German found a 27% rate of under nutrition among hospitalized patients [6]. In one study conducted in Ethiopia among adult hospitalized patients the prevalence of malnutrition was 55.6% [18].

The proportion of under nutrition in elective surgical patient in this study is higher than the studies done in Dilla, Ethiopia (12.3%) [1] and Kenya (9.8%) [3]. However, the prevalence of under nutrition was lowest compared to the study reports from other parts of Ethiopia, i.e., Humera (42.3%) [4] and Dembia (43.2%) [4] and other developing areas

The possible reasons for the continued under nutrition and weigh loss might be due diseases specific factors like loss of appetite, inflammation, swallowing difficulties, hyper catabolism; treatment related factors, such as episodes of fasting, side effects of treatment; psychological factor (anxiety, depression, loneliness) or social factors (such as poverty) [1] and their clinical condition like fistula, malabsorption syndrome, intestinal obstruction and gastric a tony [12].

Urban residency were 59.9% (AOR=0.401 95% CI 0.247-0.65) less likely to be undernourished compare to rural residency. These is lower than study done in Haramaya University, Patients from urban areas were 74% (AOR = 0.26; 95% CI: 0.11, 0.57) less likely to be undernourished compare to those from rural areas [10].

Length of hospital stay was identified associated with increased under nutrition in the current study. This was similar to studies conducted from Brazil [4], Australia [7] and multi centered study from Latin America [17].

Reducing length of hospital stay (LOS) has the potential to decrease health care cost, risk of infection and other hospital acquired diseases, and to improve patients' quality of life. Prolonged hospital stay may predispose a patient to skin colonization with more virulent hospital-based pathogens. Hospitals with reduced LOS are said to have done better than others with longer stay [17]. Reductions in postoperative length of stay may produce cost savings that can be invested in other areas of surgical Patients care [6].

In comparison to study done in America among adults, well-nourished patients were 3 times more likely to be discharged sooner (P = .0002, RR = 3.3 [1.7–6.2]) than those who had some degree of malnutrition. Well-nourished patients with digestive tract diseases (DTD) were also discharged sooner than malnourished patients with the same condition (P = .02, RR = 2.5 [1.1–5.8]). LOS was associated with disease and nutrition status. Among the more common diseases, nutrition status according to the subjective approach determined the LOS for patients with DTD and nutrition status according to arm circumference determined the LOS for patients with neoplasms[19].

Malnutrition is considered an important problem in hospitalized patients and is generally related to increased morbidity and mortality, contributing to increased length of stay and hospital costs. A multi-centric epidemiological study done in Brazil used the subjective global assessment (SGA) to investigate the prevalence of malnutrition in 4000 hospitalized patients and found that 48% were malnourished, of which 12.6% were severely malnourished. When the LOS was >15 days, malnutrition affected as many as 61% of the hospitalized patients. The prevalence of

malnutrition within the first 48 hours of hospital stay was found to be 33.2%, indicating that some patients are already malnourished on hospital admission [20].

In one of the study done in north west Ethiopia shows Patients admitted with normal weight were 1.3 times more likely to reside shorter in hospital than underweight patients and the independent significant predictors of length of hospital stay were: the hazard of hospital stay were 3.7 times lower among patients who had less than two weeks duration of disease than those greater than two weeks duration [AHR = 3.7, 95% CI (2.35–5.82)]. Hospital length of stay in admitted surgical patients who did not have history of surgery had 1.4 times less hazard of hospital stay than those who had previous surgery [14].

Rates of overall infectious complications, SSI, and mortality were significantly higher among clinically malnourished patients (P <0.05). By comparison, only overall infectious complication rates were significantly higher among under nutrition patients compared with those well-nourished participants [4]. Similarly, in the current study no under nutrition was associated with decreased risk of SSI (AOR=0.194; 95% CI 0.099-0.380). In one study done in Malaysia On multivariable logistic regression , clinical malnutrition status was associated with a significantly increased risk of overall infectious complications (odds ratio; 95% confidence interval [CI], 1.77 [1.07e2.94]), surgical site infection (95% CI, 2.65 [1.12e6.22]), and 90-day mortality (95% CI, 3.99 [1.27e12.54])[6].

In comparison to study done in Faculty of Health and Social Sciences, Western Norway University the incidence of SSI was significant higher among patients at nutritional risk (11.8%), as compared to those who were not at nutritional risk (7.0%) (p = 0.047). These results were in accordance with the multivariate adjusted analysis, demonstrating patients at nutritional risk to be 1.81 (95% CI: 1.04, 3.16) times more likely to develop SSI as compared to those patients who We're not at nutritional risk. Furthermore, the initial screening questions about weight loss and reduced dietary intake the last weeks were significantly associated with the incidence of SSI in both crude and adjusted analysis [21].

Similar studies done to investigate the association between SSI and under nutrition and shows that SSI were more likely to develop in malnourished patients (OR=2.31, 95% CI: 1.75–3.05). While preoperative malnutrition was significantly associated with SSI in patients undergoing thoracolumbar spine and sacral surgeries, no significant difference was seen in cervical spine surgeries. In subgroup analyses, similar results were observed for both hospital-based (OR=3.16, 95% CI: 1.84–5.43) and population-based studies (OR=2.00, 95% CI: 1.63–2.46)[22].

In the current study patients with no comorbidities (AOR=0.241 95% CI 0.105-0.556) less likely associated with under nutrition in surgical patients. In one study done in Assela the proposed institutional-based cross-sectional study attempts to assess the prevalence of under nutrition and its associated factors among adult surgical PLHIV and revealed that the overall prevalence of under nutrition was 18.3% [23].

We have intuitively known for a long time that poor nutritional status in disease is associated with morbidity and mortality. Only recently, however, have studies provided evidence of an association between poor nutritional status and prolonged hospital stay, decreased quality of life, and increased morbidity and mortality [10].

6. CONCULUSION AND RECOMMENDATION

6.1 Conclusion

In the current study under nutrition is highly prevalent among surgical patients. Residence, previous operation and underlying comorbidities were common factors associated with under nutrition at admission and discharge. In addition, surgical site infection and length of hospital stay were identified factors at time of discharge.

Clinical malnutrition assessment is effective in identifying patients who may be at risk for suboptimal outcomes. Surgeons should implement clinical nutritional assessment and factor that information into their preoperative evaluation and management of elective surgical patients.
The overall mortality found in this study was relatively higher compared with some studies in Ethiopia even if it is lower in some areas

6.2 Limitation of study

- This study doesn't asses' dietary diversity of individual patient.
- This study used some basic nutritional assessment tool and biochemical assessment (albumin).However; it did not include subjective assessment tool and other biochemical tests. This might provide additional information about the magnitude of the problems in the studied hospital.

6.3 Recommendation

- The hospital staff should strength nutritional assessment and nutritional counseling /support to surgically admitted patients considering the identified factors.
- Surgeons should implement clinical nutritional assessment by developing guidelines and factor that information into their preoperative evaluation and management of elective surgical patients.
- The hospital in which study conducted or the regional health bureau should also reinforce nutritional assessment and nutritional counseling /support/therapy through guideline development, training and monitoring its application.
- The regional health bureau should also work on implementable strategies considering the identified factors.
- Further studies should be conducted by using different nutritional assessment tool (subjective and objective), biochemical assessment and unidentified factors on different type's patients in the country.
- In addition, there is need for assessment on level nutritional counseling and factors associated with it among health professional working in the hospital.

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ANNEXS

Annex I. Nutrition Assessment Forms & Questionnaires

Agreement of Participation and Confidentiality

Your signature below indicates your permission and willingness to participate in the below assessments, questionnaires and interviews and consider the potential program or recommendations, including interviews and Nutritional assessment.

All information and data discussed, written, typed, or communicated will be strictly confidential between the patient and the investigating team. You agree that the information you provide in the forms, assessments and interviews is accurate and current to the best of your ability.

Signature: _____ Date: _____

Section1: Demographic Data

Card no.: _____ Sex: M/ F Age: _____ Height: _____

Current Weight: _____

BMI

1. Under nutrition
2. No under nutrition

Address:

1. Urban 2.Rural

Section 2: Socioeconomic History

Circle the last year of school attended:

1. Uneducated

2. Elementary

3. Secondary

4. College/university

Occupation

1. House wife
2. Farmer
3. Daily laborer
4. Merchant
5. Employer

Income per month or year:

1. 1-1000
2. 1001-3000
3. 3001-5000
4. >5000
5. No income

Present marital status (circle one):

5. Single
6. Married
7. Divorced
8. Widowed

Section 3: Health History

Current diagnosis: - _____

Underlying comorbidities: -

1. Yes 2. No

If yes

1. Respiratory illness
2. Cardiac illness
3. DM
4. HTN
5. Malignancy
6. Other

Previous operation: -

1. Yes 2.No

If yes what type of operation: - _____

Albumin done

1. Yes 2. No

If done

1. > Or = 3.5 2. < 3.5

Presence of edema: - 1.Yes 2.No

Section 3: Post-operative assessment

Length of hospital: -

1.1-3 days

2. 4-7 days

3. 8-14

4. >14

Surgical site infection: -

1. Yes 2.No

If yes

1. Superficial SSI
2. Deep SSI
3. Organ space SSI