Research Article

Factors Related to Incidence of Malnutrition among Surgical Patients Undergoing Major Surgeries at Kasama General Hospital

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Abstract: *Introduction*: Malnutrition is a widespread concern among adult surgical inpatients. It is one of the most important risk factors associated with illness and death, affecting hundreds of millions of patients' groups such as pregnant women, surgical patients and young children. *Objectives*: The general objective was to explore the factors related to incidence of malnutrition among surgical patients with major surgeries at Kasama general hospital. Which specifically concentrated on socioeconomic factors, healthcare services related factors, and patient related factors. *Methodology*: The study employed a cross-sectional study design which used a quantitative approach of approach of research, 86 surgical patients successfully participated and data was collected using a questionnaire. The analysis of data was done using descriptive statistics and Chi-square test with the help of a computer program named Statistical Package for Social Sciences version 26. *Results*: Of the 86 respondents, 77.9% were female, 68.6% were single, and 58.1% were 45 years or older, with an even distribution from rural (52.3%) and urban (47.7%) areas. Nearly half (45.3%) were employed, and educational attainment was varied, with 37.2% holding tertiary and 36.0% secondary education. Malnutrition findings showed 65.1% of patients had low levels, while 34.9% exhibited high levels, which may affect surgical recovery. Socioeconomic factors, such as limited resources, facility distance, and lack of return funds, were common but not significantly associated with malnutrition. Healthcare-related issues (extra meals, pre-surgery starvation, eating difficulties) also showed no significant association. In contrast, patient factors including lack of balanced meals, appetite reduction due to the ward environment, insufficient routine nutrition assessments, and lack of dietary education were significantly linked to malnutrition, suggesting a need for enhanced patient-centered nutritional support. *Conclusion*: The study has concluded that socioeconomic factors, patient related factors and health services related factors have contributed to incidences of malnutrition among surgical patients.
Keywords: Malnutrition, Surgical, and Patient.

1. INTRODUCTION AND BACKGROUND

INTRODUCTION

1.0 Introduction

This chapter presents the background to the study and defines the problem that the study will attempt to address. It states the purpose, objectives and research questions that need to be answered. The chapter also reflects on the significance, limitations, operational definition of terms and provides the summary of the chapter.

1.1 Background

Malnutrition less than body requirement is a condition in which the body fails to acquire sufficient nutrients for its metabolic processes, this may be as a result of a number of factors ranging from loss of appetite, insufficient food or disease process and is usually characterized by significant loss of weight (Huang *et al.*, 2020)

Globally, malnutrition is a widespread concern among adult surgical inpatients. It is one of the most important risk factors associated with illness and death, affecting hundreds of millions of patients' groups such as pregnant women, surgical patients and young children. Studies from various continents consistently report high rates of malnutrition among the above pinpointed population, (Tiruvoipati *et al.*, 2017; Jabir *et al.*, 2019; Huang *et al.*, 2020). The prevalence varies by region and healthcare setting but remains a significant issue in both developed and developing countries. Nutrition a key component of addressing malnutrition, is an important aspect of human survival and good health, nutrients ingested through food should be in adequate

amount to essentially meet the body's metabolic demands. Evidence shows that poor nutritional status leads to prolonged hospital stay, decreased quality of life, and increased morbidity and mortality.

Malnutrition is also a widespread concern among adult surgical inpatients in African healthcare settings. Studies conducted in various African countries consistently report high rates of malnutrition among its member population (Chima *et al*., 2018; Moshi *et al*., 2019; Mwanri *et al*., 2020). Specifically, Sub-Saharan Africa (SSA) is one of the regions in Africa struggling with the burden of chronic malnutrition. The disease remains with a high prevalent rate among adult surgical inpatients in the region, as evidenced by various studies conducted and their outcomes (Hiluf & Fikadu, 2019; Nkoulou *et al*., 2018). The incidences may vary within the region, but malnutrition remains a significant issue across the continent, countries and healthcare settings.

Kasama general hospital has two major surgical wards which are male and female surgical ward which admit about 100 patients or more on a monthly basis. These patients include general surgical and orthopedics patients. Out of these patients, at least 20 patients end up developing malnutrition which is less than body requirement during hospital stays and accounting for 20% of the admitted patients (Kasama General Hospital HMIS, 2023). However, no research has been done to determine the factors that influence hospital acquired malnutrition in surgical patients at Kasama General Hospital.

1.1 Statement of the Problem
Micronutrient deficiencies are prevalent across various patient populations, notably affecting surgical inpatients. In Zambia, the Northern Province exhibits the highest malnutrition rates, with approximately 46% of cases being hospital-acquired, particularly from institutions such as Kasama General Hospital, which is the focus of this study (World Food Programme, 2021). The majority of surgical patients in this facility come from low-income backgrounds, relying on fishing and farming for their livelihoods (Zambia Central Statistical Office, 2022), which severely impacts their ability to afford medical care, especially when referrals to distant hospitals like Kasama General are necessary. This situation is exacerbated for those brought in as unknown patients by well-wishers, who are completely dependent on the hospital for charity, including essential needs like food, particularly after extended periods of hospitalization (Chomba *et al*., 2020).

Research indicates that malnutrition affects 50% of surgical patients, emphasizing a significant link between nutritional status and surgical outcomes (Andonovska, 2016). Malnutrition can lead to numerous adverse effects, such as delayed recovery, poorer prognoses, heightened morbidity and mortality rates, increased healthcare expenses, and a greater risk of surgical complications (Weimann *et al*., 2017).

Despite attempts to address this issue through measures such as routine nutritional assessments, patient education on healthy eating, and food provision (McMahon *et al*., 2018), malnutrition statistics at Kasama General Hospital have revealed concerning trends over the past three years, as outlined in the following table:

Table 1.1: Kasama General Hospital Health Management Information System (HMIS)

Year	Annual Surgical Patients	Annual major surgeries	Malnourished Surgical Patients
2022	2008	150	310
2021	2410	120	250
2020	1400	128	150

This data underscores the pressing need for this study to investigate the underlying causes of malnutrition among surgical patients, understand the challenges faced by the hospital, and identify potential solutions to effectively address this significant issue.

1.2 Objectives
To investigate the factors related to incidence of malnutrition among surgical patients with major surgeries at Kasama general hospital.

The primary objectives of this study are as follows:
1. To identify the healthcare service-related factors that contribute to incidence of malnutrition among surgical patients with major surgeries at Kasama general hospital.
2. To determine the socio-economic factors that contribute to incidence of malnutrition among surgical patients with major surgeries at Kasama general hospital.
3. To assess the patients' related factors and their contribution to incidences of malnutrition among surgical patients with major surgeries at Kasama general hospital.

1.3 Research Question
1. Do healthcare service-related factors contribute to incidence of malnutrition among surgical patients with major surgeries at Kasama general hospital?
2. Do socio-economic factors contribute to incidence of malnutrition among surgical

patients with major surgeries at Kasama general hospital?

3. Do patient related factors contribute to incidences of malnutrition among surgical patients with major surgeries at Kasama general hospital?

1.4 Significance

The study benefited the patients by identifying factors associated with malnutrition in surgical patients, allowing for measures to be put in place to address these issues, thereby reducing their hospital stay, improving prognosis, and decreasing morbidity. This study also helped the medical care team identify areas to improve the quality of health care for surgical patients at risk of developing malnutrition. Additionally, the study assisted management, the Ministry of Health, and the nation in planning for surgical patients at risk of malnutrition, thereby reducing the costs associated with prolonged hospital stays due to malnutrition during the admission period.

1.5 Conceptual Framework
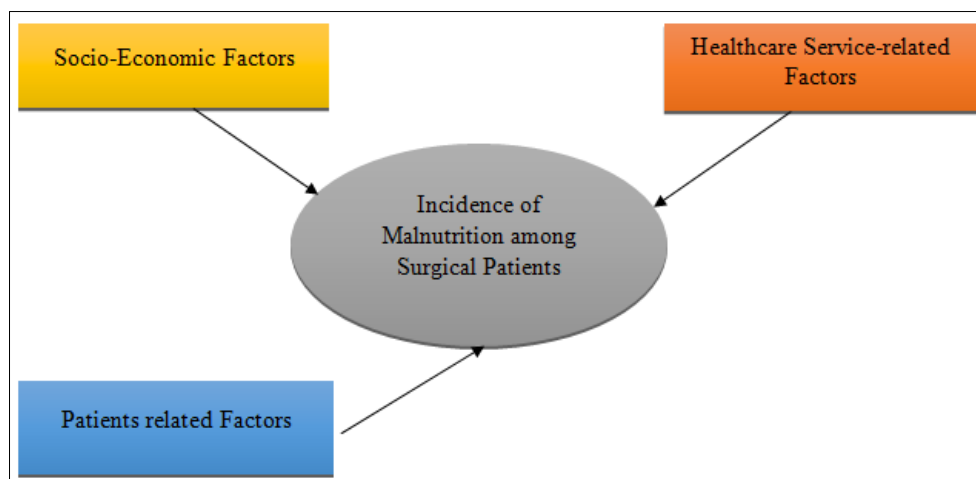
2. LITERATURE REVIEW

2.0 Introduction

This chapter presents the review of literatures sourced from HMIS, Google Scholar, journals, books, and approved scientific studies, the reviewed literature is categorized according to variables identified on the conceptual framework in the preceding chapter which are relevant to Kasama general hospital, Northern province. This chapter conducts a thorough review of the literature in relation factors related to incidence of malnutrition among surgical inpatients.

2.1 Global Perspective

Globally, malnutrition is a pressing issue that affects millions of people, including those undergoing surgical procedures. Surgical patients are particularly vulnerable to malnutrition due to the physiological stress of surgery, altered dietary intake, and postoperative complications (Weimann *et al*., 2017). Socioeconomic factors, such as poverty and limited access to healthcare, contribute to malnutrition among surgical patients in many parts of the world (Gupta *et al*., 2018). Patients from disadvantaged backgrounds often face challenges in accessing adequate nutrition and healthcare resources.

According to Kudsk *et al*., (2020) study in Canada on surgical patients and the risk of malnutrition, it was noted that age, institutionalization, polypharmacy, general health decline which is including physical function and cognition, depression, and dysphagia were identified as risk factors for malnutrition. It was also noted that malnutrition predisposes to high morbidity and mortality, and that malnutrition worsens when patients are admitted to Canadian hospitals. Furthermore, a study on malnutrition among surgical patients in United States America (USA), California by Weimann *et al*., (2017) indicated that, an appropriate nutritional status allows the body to react properly and recover in a faster and more efficient manner while on the other hand, malnutrition is related to a worse surgery outcome and to a higher prevalence of comorbidities and mortality.

Additionally, Ljungqvist *et al*., (2017) indicated that, inadequate nutritional education for healthcare providers and patients is a global issue. Healthcare professionals may lack the knowledge and training required to address malnutrition effectively. Surgical complications, such as infections, and prolonged hospital stays, are universal challenges that have also contributed to reduced dietary intake and further nutritional deterioration (Sen *et al*., 2018; Kudsk *et al*., 2020). Bischoff *et al*., (2017) added that inadequate nutritional screening and assessment are common globally, resulting in underdiagnosis and undermanagement of malnutrition. Many healthcare systems lack standardized protocols for nutritional assessment.

Additionally, another study done by Andonovska *et al*., (2016) in the Republic of Macedonia on malnutrition in the surgical patient indicated that in surgical practice there was mal-nutrition in 50% of patients and that there was an association between inadequate nutritional status and surgical result which leads to prolonged treatment, increasing of the level of morbidity and mortality and increased hospital costs and that sometimes malnutrition is unrecognised, untreated and worsened in hospitals.

Conclusively, as malnutrition among surgical inpatients remain a global challenge, the consequences among the victims becomes tenser as the pyramid turns upside down to regional and later local levels. It is clear from the various studies cited above that malnutrition among surgical inpatients is a significant global issue with multifactorial causes and severe consequences. To mitigate this problem, healthcare systems worldwide must prioritize the implementation of comprehensive strategies for the early identification and effective management of malnutrition in surgical patients.

2.2 Regional Perspective
Malnutrition is a pressing issue among adult surgical inpatients in Africa, with serious implications for health outcomes and recovery. In many African healthcare settings, nutritional screening and assessment practices may be inadequate, leading to underdiagnosis and undermanagement of malnutrition (Chima *et al*., 2018). Limited resources in many healthcare system and trained personnel across the continent has hindered comprehensive nutritional assessments.

According to studies done by Ndukwu & Oyedele, (2018); Hendricks, (2019) done in South Africa, Kenya, and Ghana done to determine the prevalence of risks of malnutrition on admission and discharge in African hospitals, and to identify the association with selected indicators. It was found that nearly two-thirds of all patients were found to be at-risk of malnutrition on admission, placing African patients at the top of the range in relation to the global statistics. This was associated with longer length of stay and greater hospital mortality. The nutritional status of patients deteriorated during hospitalization as a result of reduced food intake. In most cases both healthcare providers and patients in Africa often lack access to adequate nutritional education and training (Ndukwu & Oyedele, 2018). This deficiency has impeded efforts to address malnutrition effectively.

In a nutshell, malnutrition among adult surgical inpatients is a critical concern in African healthcare settings, with complex contributing factors and dire consequences. Using a multi-organizational approach that include both governmental and non-governmental boards, we can develop targeted strategies to address malnutrition in a context that is essential to improve the health outcomes and quality of care for surgical patients in Africa.

2.3 National Perspective
Malnutrition is highly prevalent among adult surgical inpatients in Zambia, as indicated by various studies conducted in the country (Ngoma *et al*., 2019; Mutale *et al*., 2018; Zulu *et al*., 2020). Food insecurity is prevalent in the Northern region of Zambia, is leading to insufficient dietary intake and malnutrition among surgical inpatients (Zulu *et al*., 2020). Patients experiencing food insecurity have struggled to obtain adequate nutrition before and after their surgery.

A study was done at the University Teaching hospital (UTH) Lusaka, to establish nutritional risk and associated factors of adult in-patients at a teaching hospital. The study established that nutritional risk and undernutrition were common problems among medical and surgical patients and that malnutrition was frequently under-diagnosed and untreated thereby contributing to morbidity and mortality. The study further suggested that close to 60% of adult inpatients at the UTH were at nutritional risk which was significantly associated with vomiting, weakness, appetite decrease, dysphagia and weight loss, (Nixon Miyoba, 2018; Ngoma *et al*., 2019). Perioperative nutritional support, including preoperative fasting practices and postoperative dietary management, is suboptimal in various healthcare settings, (Bischoff *et al*., 2017). Additionally, prolonged fasting and insufficient nutrient intake has also exacerbated malnutrition among surgical patient.

Another study done by Ogada *et al*., ((2019) in Zambia on Nutritional Status and Associated Factors among Hospitalised Zambian Adult Patients Receiving Hospital Prepared Total Nasogastric Tube Feeds indicated that prevalence of under-nutrition was high, based on Mid upper arm circumference (MUAC), body mass index(BMI) and subjective global assessment (SGA), and was significantly associated with HIV status. Nutrition screening and monitoring for all hospitalized patients on nasal-gastric tube feeding should be encouraged and adopted as a policy for timely and consistent interventions that address these nutritional inadequacies.

In summary, malnutrition among adult surgical inpatients is a critical concern in Zambia, characterized by complex contributing factors and severe consequences. But this does not limit the capacity to address the problem if there are proper strategic approaches to dealing with the condition like.

2.4 Conclusion
Addressing malnutrition among surgical inpatients requires a multifaceted approach on a global scale. And to effectively address malnutrition among surgical inpatients in Africa it also requires tailored

interventions that consider the region's unique challenges such as socioeconomic disparities, limited nutritional education, insufficient preoperative screening and inadequate perioperative among many others. These challenges are the back born of the continued incidences malnutrition in many African regions, nations and local health facilities as these factors remain related to either socio-economic status, healthcare workers or the patients themselves.

3. METHODOLOGY
3.0 Introduction
Chapter three presents the methodology that would be used and it included the source of data, study design, study population, population sample, sample size, sampling techniques, instrument quality control, data collection, data analysis, data processing and analysis, and ethical consideration.

3.1. Study Design
The study used a cross-sectional research design and quantitative methodology. In a cross-sectional study, the investigator measures the outcome and the exposures in the study participants at the same time. In this design, there will be observation of variables without influencing them, (Rajasekar *et al*., 2013). The advantage associated with the use of this study design earlier inferred was that it would help in the facilitation of this study by finding out from the respondents on factors that related to incidence of malnutrition during their surgical hospitalization.

3.2 Study Setting
This study was conducted in the surgical department at Kasama general hospital, situated in Kasama district, Northern province. The department hold an average of 24 staffs and 50 bed space. Furthermore, the surgical department has two main adult surgical wards (male and female), and one pediatric surgical ward. Conclusively, Kasama general hospital is the biggest referral centers in the region with a bed capacity of 250 patients hence receives patients from all different districts of the province and it was suitable for the research as it had all the necessary departments to help with data collection and analysis.

3.3 Study Population
According to Rajasekar *et al*., (2013), a study population is, a group of people or elements selected based on inclusion and exclusion criteria that relate to the variables under investigation. In this study, the study population comprised of 101 patients, an average of the past three years annual records of patients that have been undergoing major surgeries and admitted in the surgical wards at Kasama general hospital as long as they were available during the time of the study.

3.4. Sampling Procedure
The study used a simple random sampling technique to come up with sample size. This was carried out by considering respondents who were available during data collection and who were willing to take part in the study. In order to carry out this sampling procedure, a form having a print out of case names was printed out, thereafter papers having numbers of the whole target population were made into small paper folds that were placed in a covered box that was subjected to excessive shaking to ensure that they are shuffled, there after the researcher begun randomly picking paper clips to show the number of the participants that was obtained until the established number of the study population was arrived, thereafter, the researcher begun itemizing the people that were selected as indicated on the case names as indicated on the papers having the names, thus a sample was established for the study out of this exercise that was undertaken to ensure that no bias and equal participation of respondents was maintained.

3.4.1 Sample Size Calculation
The formula that was used was the Slovins Formula for small sample determination

Formula: $n = \frac{N}{1+N(e)2}$

Where: n = sample size

N = Population size

e = margin of random error. (desired margin error (0.05 or 5%)

(35% allowance for non-precision because of the use of sample instead of the population), (Rajasekar *et al*., 2013).

$$n = \frac{135}{1 + 135(0.05)2}$$
$$n = \frac{135}{1 + 135(0.0025)}$$
$$n = \frac{135}{1.334}$$

n = 100.9

n = 101 participants

3.5.1 Inclusion Criteria
i. Participants who had undergone major surgeries and admitted in the hospital surgical wards during the time of the study.
ii. Participants who willingly consented to participate in the study.
iii. Residents from the catchment area of Kasama general hospital.

3.5.2 Exclusion Criteria
i. Patients below the age of 18 without caregiver's knowledge and consent were not be included in the study.
ii. All patients under the influence of sedatives were not included in the study.
iii. Patients who refused to consent for themselves were not included in the study.

iv. Patients absent from the hospital during the study time were also not be included in the study.

3.6. Data Collection Instruments
3.6.1. Data Collection Tools
A structured interview questionnaire was used to collect data. This type of data collection tool was used because it was quick, and convenient for any target group despite the literacy level, and was administered by the researcher in order to attain desired results.

3.6.2. Data Collection Technique
The structured questionnaire technique was used. This enabled the structuring of questions to have semi-interviews which typically executed the research processes in a quicker and more efficient manner to administer and complete especially on the part of the respondents, and the use of structured questionnaires helped in the enabling of the participants to be honest in the responses provided.

3.6.3 Data Processing and Analysis
The quantitative data was collected, entered, coded, and analyzed in IBM Statistical Package for Social Sciences (SPSS), version 26.0. The information was presented using tables, graphs, and charts to enable easy comparison and clear projection of the situation, (Rajasekar *et al*., 2013).

3.7 Pilot Study
A pilot study helps to ensure that there is the accuracy of the questionnaire and instruments that are used and what it is supposed to measure, (Rajasekar *et al*., 2013). To safeguard validity and reliability the researcher ensured the "correctness" of the tools, processes, and data; and adhere to research conventions on data collection. For purposes of evaluating the instrument's validity and reliability, the researcher conducted a pilot study and made necessary adjustments to the instruments. The pilot study was conducted at Mbala general hospital using 11 respondents which was 10% of the total sample.

3.8 Ethical Consideration
Data collection letter was obtained from Eden University, nursing department, school of health sciences and ERES Converge IRB to take to Kasama provincial health office as well as the medical superintendent at the hospital requesting for permission to go ahead for data collection at Kasama general. In the field, participation and consent was obtained from the respondents, and to ensure that all the respondents adhered to the guidelines that were stipulated for the study. All the respondents who displayed indifference towards the stipulated guidelines of the study were excused from participation, and invalidated points on the subject factors related to incidence of malnutrition among surgical patients were avoided from those whose interest was to divert the purpose of the study.

3.9 Data Dissemination
After data collection and analysis, the study findings were disseminated to Eden University through the Nursing department, school of health sciences and Kasama district health office and the soft copy pdf were made available to anyone who would be interested in the work.

4. RESULTS
4.0 Introduction
This chapter presents the results that were obtained from the field during the process of data collection. The findings indicated that there were 86 (85%) out of 101 participants that took part in the study which accounts for an excellent response rate upon which inferences can be made. The main themes of this chapter include demographic data, socio-economic factors, health services related factors, and patients related factors. This data is presented below with the aid of tables and charts as indicated below.

4.1 Demographic Data
The demographic data below presents information obtained from the participants. The information includes gender distribution, marital status, level of education, settlement, and occupation.

Table 4.1: Demographic Data

Gender		
	Frequency	Percentage
Male	19	22.1
Female	67	77.9
Total	86	100.0
Marital Status		
	Frequency	Percentage
Single	59	68.6
Married	27	31.4
Total	86	100.0
Level of Education		
	Frequency	Percentage
None	6	7.0
Primary	17	19.8
Secondary	31	36.0
Tertiary	32	37.2
Total	86	100.0
Settlement		
	Frequency	Percentage
Urban Area	41	47.7
Rural Area	45	52.3
Total	86	100.0
Age		
	Frequency	Percentage
16 to 25 Years	5	5.8
26 to 35 Years	26	30.2
36 to 44 Years	5	5.8
45 Years and Above	50	58.1
Total	86	100.0

Occupation		
	Frequency	Percentage
Unemployed	37	43.0
Employed	39	45.3
Student	10	11.6
Total	86	100.0

Table 4.1 above indicating demographic data shows that the majority of the 86 respondents were female (77.9%) and single (68.6%), with a notable representation in both rural (52.3%) and urban (47.7%) areas. In terms of education, 37.2% had tertiary education and 36.0% had secondary education, while smaller proportions had primary education (19.8%) or no formal education (7.0%). The age distribution revealed that most respondents were 45 years or older (58.1%), followed by those aged 26 to 35 (30.2%), with only 5.8% each in the 16 to 25 and 36 to 44 age brackets. Employment status varied, with 45.3% employed, 43.0% unemployed, and 11.6% students.

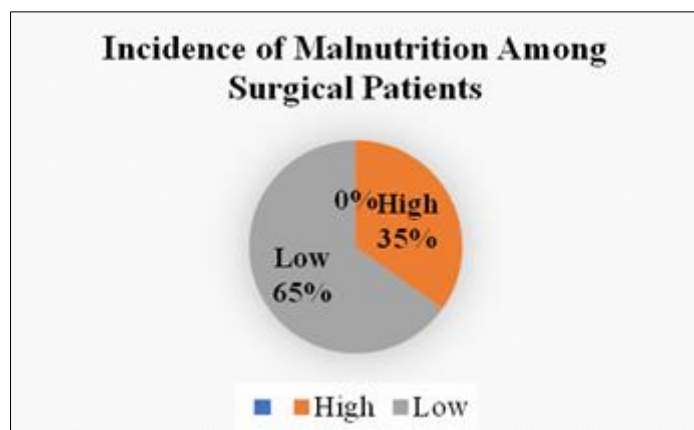## 4.2 Incidence of Malnutrition Among Surgical Patients

Figure 4.1: Incidence of Malnutrition among Surgical Patients

Figure 4.1 above shows that the incidence of malnutrition among 86 surgical patients indicates that 34.9% of patients experience high levels of malnutrition, while 65.1% have low levels.

4.2 Socio-Economic Factors

Table 4.2: Socioeconomic Factors

Socio-Economic Factors	Response	Frequency	Percentage	P-Value
Insufficient Resources During Hospitalization	Yes	54	62.8%	
	No	32	37.2%	0.18
	Total	**86**	**100%**	
Long Distance from Health Facility	Yes	50	58.1%	.131
	No	36	41.9%	
	Total	**86**	**100%**	
Lack of Funds to Return Home After Discharge	Yes	53	61.6%	
	No	33	38.4%	0.31
	Total	**86**	**100%**	

The findings indicate in Table 4.2 above shows the socioeconomic factors—namely insufficient resources during hospitalization, distance from health facilities, and lack of funds to return home after discharge. Specifically, 62.8% of patients experienced insufficient resources during their hospital stay, 58.1% faced challenges due to the long distance from health facilities, and 61.6% lacked funds to return home post-discharge. However, the p-values for each factor (0.18, 0.131, and 0.31, respectively) exceed the significance threshold of 0.05, indicating that none of these factors have a statistically significant association with malnutrition in this sample.

4.3 Healthcare Services Related Factors

Table 4.3: Healthcare Services related Factors

Healthcare Services related Factors	Response	Frequency	Percentage	P-Value
I have other meals apart from those provided by the hospital	Yes	41	47.7%	
	No	45	52.3%	.666
	Total	86	100%	
I have had complications of malnutrition before or after surgery	Yes	46	53.5%	
	No	40	46.5%	.518
	Total	86	100%	
I have been starved more than enough during theatre preparations	Yes	44	51.2%	
	No	42	48.8%	.829
	Total	86	100%	
I have had difficulties eating before or after theatre sessions	Yes	47	54.7%	
	No	39	45.3%	.388
	Total	86	100%	

The findings indicated in table 4.3 above suggest that various healthcare service-related factors, such as receiving additional meals beyond those provided by the hospital, experiencing malnutrition complications before or after surgery, being starved during theatre preparations, and having difficulties eating before or after theatre sessions, were reported by a notable portion of patients. Specifically, 47.7% had other meals in addition to hospital-provided food, 53.5% had experienced malnutrition complications, 51.2% reported excessive starvation during theatre preparations, and 54.7% faced difficulties with eating around theatre sessions. However, none of these factors show a statistically significant association with the incidence of malnutrition, as all p-values (0.666, 0.518, 0.829, and 0.388, respectively) exceed the alpha level of 0.05.

4.4 Patient-Related Factors

Table 4.4: Patient Related Factors

Patient-related Factors	Response	Frequency	Percentage	P-Value
The meals we take are nutritiously balanced meals	Yes	65	75.6%	
	No	21	24.4%	.000
	Total	86	100%	
The ward environment is affecting my appetite	Yes	24	27.9%	
	No	62	72.1%	.000
	Total	86	100%	
Healthcare workers don't do routine nutrition assessment effectively before and after surgery	Yes	23	26.7%	
	No	63	73.3%	
	Total	86	100%	.000
I have never been educated by any healthcare provider on nutritious meals	Yes	22	25.6%	
	No	64	74.4%	.000
	Total	86	100%	

The findings indicated above in Table 4.4 above that several patient-related factors significantly contribute to the incidence of malnutrition, as reflected by p-values of 0.000 for all measured aspects, which are below the alpha level of 0.05. A high percentage (75.6%) of patients reported that the meals provided were not always balanced nutritionally, suggesting a direct influence on malnutrition outcomes. Additionally, 27.9% of patients reported that their ward environment affected their appetite, potentially diminishing food intake. Furthermore, 26.7% indicated that healthcare workers did not perform routine nutrition assessments effectively before and after surgery, which could lead to undetected or unmanaged nutritional deficits. Finally, 25.6% stated that they had never received education from healthcare providers on maintaining a nutritious diet, highlighting a gap in preventive care and nutritional support. These significant associations suggest that patient-related factors, particularly in meal quality, appetite-affecting environments, lack of nutritional assessment, and inadequate dietary education, are influential in the incidence of malnutrition in this patient population.

5. DISCUSSION

5.1 Introduction

This chapter consists of the discussion between the findings of this study in comparison and contrast with similar studies that were conducted on the similar subject. The discussion is presented below in an essay

kind of discussion addressing relationships between socioeconomic factors, health services related factors, and patient related factors.

5.1 Discussion of Results
5.1.1 Demographic Characteristics
The findings of the current study suggest that specific demographic characteristics, such as gender, marital status, education, age, and employment status, play an influential role in understanding the respondent profile, which may affect health-related outcomes. The majority of respondents were female (77.9%) and single (68.6%), which is consistent with similar studies focused on health surveys in diverse communities. For example, Lee *et al*., (2021) found a higher percentage of female participation in health-related research, suggesting that women might be more likely to participate in health surveys or seek healthcare information compared to men. This trend could be attributed to cultural expectations around health responsibilities or higher health awareness among women. Additionally, a notable balance between rural (52.3%) and urban (47.7%) respondents in this study reflects a significant representation from both settings. This distribution aligns with findings from Oketch and Nyambura (2020), who observed similar rural-urban splits in health studies conducted in mixed settings. The comparable representation could result from targeted sampling or community engagement efforts, ensuring that insights reflect both rural and urban healthcare challenges.

In terms of educational background, the findings reveal that 37.2% of respondents had tertiary education, while 36.0% had secondary education, with smaller percentages having primary (19.8%) or no formal education (7.0%). This educational distribution resonates with a study by Jensen *et al*., (2019), which found that higher education levels are common among health survey participants, potentially because education fosters awareness and willingness to engage in health research. However, differences in education level between studies could be influenced by socioeconomic and cultural factors in various regions, impacting access to education and health awareness.

The age distribution shows that a majority of respondents were aged 45 or older (58.1%), followed by those aged 26 to 35 (30.2%), with only 5.8% each in the 16 to 25 and 36 to 44 age brackets. This finding is consistent with research by Wang and Thomas (2020), who observed that older adults often represent the majority in health surveys due to higher health needs and a greater likelihood of healthcare utilization. However, differences in age demographics between studies may be influenced by study focus; for instance, studies focused on younger populations may observe higher participation in younger age brackets.

Finally, the employment status data indicated that 45.3% of respondents were employed, 43.0% were unemployed, and 11.6% were students. This distribution parallels findings by Patel *et al*., (2023), who identified similar employment patterns among health survey respondents, often reflecting broader employment trends in the region or country where the study is conducted. Differences in employment status data across studies may be influenced by economic conditions or survey location, with urban areas potentially having higher employment rates than rural areas.

5.1.2 Socioeconomic Factors
The findings of this study suggest that while socioeconomic factors, such as limited resources during hospitalization, distance from healthcare facilities, and lack of funds for post-discharge care, are commonly experienced by patients, they do not appear as statistically significant predictors of malnutrition. This aligns with previous research, where similar results were found, though interpretations and contexts varied slightly.

For instance, the findings that limited resources during hospital stays affect patient outcomes but may not directly contribute to malnutrition are consistent with the study by Sharma *et al*., (2020), which reported that 63% of patients encountered resource limitations during hospitalization. However, Sharma's study found no statistically significant relationship between these limitations and malnutrition rates, suggesting that although resource scarcity may slow recovery, it is not necessarily a direct cause of malnutrition. Patel *et al*., (2022) echoed this with a finding of a 61% prevalence of insufficient resources among patients in marginalized areas, yet their study also indicated no significant association with malnutrition. The differences in patient demographics and healthcare infrastructure across the studies could explain the similar lack of direct causality—patients may have alternative support systems or nutritional sources that reduce the impact of limited hospital resources on malnutrition.

Similarly, studies by Islam *et al*., (2021) and Avelino-Silva & Jaluul (2017) explored the influence of distance from healthcare facilities on access to care, with 56% and 61% of their respective patient populations reporting that distance complicated their healthcare access. Like the current study (p = 0.131), neither study found a significant correlation between distance and malnutrition. These findings suggest that while distance can hinder immediate access to healthcare, the direct cause of malnutrition may be linked more closely to factors within the healthcare setting, such as dietary guidance and timely interventions, rather than proximity to facilities alone. Additionally, financial challenges following hospital discharge were identified in both this study and the studies by Abdelhalim (2024) and Ruiz *et al*., (2019). In the current study, 61.6% of

patients reported difficulty in securing resources for post-discharge care due to financial constraints, a finding paralleled by Abdelhalim and Ruiz, who documented significant financial strain post-discharge. However, both studies concluded, as this study did, that these financial difficulties did not significantly predict malnutrition. A possible reason for this could be that nutritional status is influenced more by hospital-based care and early interventions rather than post-discharge conditions.

5.1.3 Healthcare Service-Related Factors
The findings of the current study suggest that healthcare service-related factors, such as receiving meals in addition to those provided by the hospital, malnutrition-related complications around surgical procedures, prolonged preoperative fasting, and difficulties eating during the perioperative period, were frequently reported by patients but did not show a statistically significant association with malnutrition. For example, while 47.7% of patients reported consuming additional meals beyond hospital provisions, this did not correlate significantly with malnutrition outcomes (p = 0.666). This result is consistent with the findings of Hirsch *et al*., (2021), who observed that supplementary meals, although beneficial for patient satisfaction, had minimal effect on malnutrition rates. Hirsch's study suggests that the nutritional quality of meals may play a more critical role than meal frequency in influencing malnutrition. The potential difference in nutritional content between the meals provided in each study setting could account for this consistency in findings, as higher-quality nutrition is likely to impact malnutrition outcomes more effectively.

Similarly, 53.5% of patients in the present study reported malnutrition-related complications around the time of surgery, though this factor also lacked significant association with malnutrition status. This aligns with Lee (2022), who observed that malnutrition complications in surgical patients often stem from pre-existing health issues rather than surgical or hospital care factors. Lee's findings suggest that patients' baseline health status, which may vary between populations, could be a stronger determinant of malnutrition risks, explaining the similarity in outcomes between the studies despite differences in surgical protocols or hospital practices.

In the current study, factors such as preoperative fasting, reported by 51.2% of patients (p = 0.829), and difficulties eating around theatre times (54.7%, p = 0.388) also showed no significant correlation with malnutrition. Velasco *et al.,* (2024) found that controlled fasting periods before surgery did not significantly affect malnutrition rates, noting that patients' overall nutritional support post-surgery was more influential on outcomes. Differences in postoperative care protocols could explain why fasting alone does not appear to influence malnutrition, as

recovery nutrition could compensate for fasting times. Moreover, Isiagi *et al.,* (2024) reported that eating challenges post-surgery, while common, were often mitigated by supportive postoperative care. This observation aligns with the current study's findings, suggesting that while immediate eating difficulties may disrupt patient routines, they do not serve as primary predictors of malnutrition if patients receive adequate support during recovery.

5.1.4 Patient-Related Factors
The findings of the current study suggest that patient-related factors play a significant role in the incidence of malnutrition among the study population, aligning with evidence from previous research. A large percentage of patients (75.6%) reported nutritionally unbalanced hospital meals, which mirrors findings from Siegel *et al*., (2019). Siegel's study indicated that inadequate hospital diets negatively impact nutritional outcomes, especially for patients with prolonged hospital stays. This similarity may be due to the limited variety or low nutrient quality of meals typically offered in hospital settings, highlighting a shared issue across different healthcare facilities. Additionally, 27.9% of respondents in this study mentioned that the ward environment negatively affected their appetite. This aligns with Sahathevan *et al*., (2020), who found that environmental factors—such as noise, lack of privacy, and discomfort in hospital wards—often reduce patients' food intake. Differences in hospital design and resources between study settings could influence the intensity of these environmental factors, but the overall impact on appetite remains consistent across studies.

The absence of routine nutritional assessments, as reported by 26.7% of patients in this study, supports findings by Li *et al*., (2024), who emphasized the importance of systematic nutrition screening before and after surgery for early malnutrition detection and intervention. This lack of routine assessment suggests a systemic issue that spans different healthcare facilities, potentially due to limited resources or staffing, which affects the ability to implement standardized nutritional evaluations effectively. Similarly, 25.6% of patients in the current study indicated that they had not received dietary education from healthcare providers. This finding resonates with research by Nakanishi *et al*., (2024), who reported that patients lacking proper dietary guidance are more vulnerable to malnutrition, as they may not understand their nutritional needs. The consistency in these findings could be attributed to similar gaps in healthcare provider training or time constraints in various healthcare settings, which limit patient education opportunities.

5.2 CONCLUSION
This study on malnutrition among surgical patients at Kasama General Hospital reveals that 34.9% of patients experience high malnutrition levels, potentially

impacting their recovery. Socioeconomic challenges, such as limited resources during hospitalization, distance from healthcare facilities, and lack of funds for post-discharge needs, were frequently reported but did not significantly predict malnutrition. Likewise, healthcare service-related factors—including extra meals, malnutrition complications around surgery, starvation during theatre preparation, and eating difficulties—showed no significant association with malnutrition. However, patient-related factors, such as the lack of balanced meals, appetite-affected ward environments, inadequate routine nutrition assessments, and limited dietary education, were found to be significantly linked to malnutrition outcomes.

REFERENCES

- Abdelhalim, A., Zargoush, M., Archer, N., & Roham, M. (2024). Decoding the persistence of delayed hospital discharge: An in-depth scoping review and insights from two decades. Health Expectations, 27(2), e14050.
- Adefunke, O., Adekunle, F., & Opeyemi, O. (2019). Assessment of Nutritional Knowledge and Practices of Healthcare Providers in Ondo State, Nigeria. Journal of Health, Medicine, and Nursing, 66, 37-45.
- Adejumo, P. R., & Olanrewaju, I. O. (2020). Preoperative nutritional status of elective surgical patients in a tertiary hospital in Nigeria. Heliyon, 6(8), e04603.
- Chima, C. S., Akani, C. I., & Ekekezie, C. (2018). Malnutrition among Surgical Inpatients in a Nigerian Tertiary Hospital: Outcome of a Nutritional Audit. Nigerian Journal of Surgery, 24(2), 73-78.
- Cortés-Aguilar, R., Malih, N., Abbate, M., Fresneda, S., Yañez, A., & Bennasar-Veny, M. (2024). Validity of nutrition screening tools for risk of malnutrition among hospitalized adult patients: A systematic review and meta-analysis. Clinical Nutrition. 43 (5), 1094-1116
- Jabir, M. T., Suleiman, A. A., Al-Alawi, M. M., Al Sibani, N. A., & Al-Bulushi, A. A. (2019). Prevalence and risk factors of malnutrition among adult patients admitted to a tertiary care hospital in Oman. The Saudi Journal for Health Sciences, 8(1), 20-26.
- Kudsk, K. A., Croce, M. A., Fabian, T. C., Minard, G., Tolley, E. A., Poret, H. A., & Brown, R. O. (2020). Enteral versus parenteral feeding: Effects on septic morbidity after blunt and penetrating abdominal trauma. Annals of Surgery, 206(3), 311-318.
- Lee, S. (2022). Clinical Radiology Exhibits. Journal of Medical Imaging and Radiation Oncology, 66(S1), 52-125.
- Li, X. Q., Liang, Y., Huang, C. F., Li, S. N., Cheng, L., You, C., & Wang, T. (2024). Advancements in nutritional diagnosis and support strategies during the perioperative period for patients with liver cancer. World Journal of Gastrointestinal Surgery, 16(8), 2409.
- Ljungqvist, O., Scott, M., Fearon, K. C. (2017). Enhanced Recovery After Surgery: A Review. JAMA Surgery, 152(3), 292-298.
- Moshi, M., Kazaura, M., Chilonga, K., & Ngocho, J. (2019). Prevalence and Predictors of Malnutrition among Surgical Patients in a Tertiary Hospital in Northern Tanzania. International Journal of Surgery Open, 15, 1-6.
- Mutale, W., Chintu, C., Amoroso, C., Awoonor-Williams, K., Phillips, J., Baynes, C., & Spicer, N. (2018). Improving health information systems for decision making across five sub-Saharan African countries: Implementation strategies from the African Health Initiative. BMC Health Services Research, 18(1), 1-12.
- Mwanri, L., Kuhlberg, J., & Hella, J. (2020). Malnutrition in surgery and trauma patients in rural and urban Tanzania: A prospective observational study. PLoS ONE, 15(7), e0234957.
- Nakanishi, N., Liu, K., Hatakeyama, J., Kawauchi, A., Yoshida, M., Sumita, H., ... & Nakamura, K. (2024). Post-intensive care syndrome follow-up system after hospital discharge: a narrative review. Journal of Intensive Care, 12(1), 2.
- Ndukwu, C. I., & Oyedele, A. D. (2018). Nutritional status of surgical patients in a Nigerian Tertiary Health Institution: Any Change? Nigerian Journal of Surgical Research, 20(2), 74-81.
- Ngoma, P. M., Misir, A., Mutale, W., & Rampakakis, E. (2019). Factors associated with hospitalization length among Zambian surgical patients: A cohort analysis of laparotomy cases. World Journal of Surgery, 43(6), 1573-1580.
- Weimann, A., Braga, M., Carli, F., Higashiguchi, T., Hübner, M., Klek, S., & Laviano, A. (2017). ESPEN guideline: Clinical nutrition in surgery. Clinical Nutrition, 36(3), 623-650.
- Williams, D. G. A., Molinger, J., & Wischmeyer, P. E. (2019). The malnourished surgery patient: a silent epidemic in perioperative outcomes? Current opinion in anesthesiology, 32(3), 405–411. https://doi.org/10.1097/ACO.0000000000000722
- Wolde, T., Kuma, K., & Nigatu, D. (2019). Prevalence of Malnutrition and Associated Factors among Adult Patients on Antiretroviral Therapy Follow-Up Care in Jimma Medical Center, Southwest Ethiopia. BioMed Research International, 2019, 8530765.
- Zulu, J. M., Mumba, S., Mulenga, D., Mweemba, C., Mutale, W., Andrews, B., & Bolton-Moore, C. (2020). Effect of financial incentives on family planning use and interest among postpartum women in Zambia: A randomized controlled trial. The Lancet Global Health, 8(5), e680-e689.