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DEPARTMENT OF NURSING

IDENTIFYING CHANGEABLE ELEMENTS OF MALNUTRITION IN ADULT CANCER PATIENTS

Master Degree Thesis

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Çankırı 2021

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CANCER PATIENTS**

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**Health Science Institute
Department Of Nursing**

Master Degree Thesis

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Çankırı 2021

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ETHICAL DECLARATION

I present to you, my Master's thesis entitled Identifying Changeable Elements Of Malnutrition In Adult Cancer Patient, under the supervision and guidance of my research supervisors including idea and hypothesis and certify that I have written it according to ethics and scientific values, upon which scientific research is based in writing the thesis.



Signature
03 September 2021
Abdulrahman ALJANABI

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ABBREVIATIONS AND SYMBOLS

BMI	: Body Mass Index
CC	: Calf Circumference
CRC	: Colorectal Cancer
GIT	: Gastrointestinal Tract
GIC	: Gastrointestinal Cancer
GI	: Gastrointestinal
MNA-LF	: Mini Nutritional Assessment -Long Form
MUAC	: Mild Upper Arm Circumference
QoL	: Quality of Live
5-FU	: 5- Fluorouracil
W/H	: Weight on Height
WHO	: World Health Organization

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ERİŞKİN KANSER HASTALARINDA MALNÜTRİSYONUN DEĞİŞTİRİLEBİLİR UNSURLARININ BELİRLENMESİ

ÖZET

AL-JANABI, Abdulrahman. Erişkin Kanser Hastalarında Malnütrisyonun Değiştirilebilir Unsurlarının Belirlenmesi, Yüksek Lisans Tezi, Çankırı, 2021.

Giriş: Malnütrisyon ve kilo kaybı, malign hastalığı olan hastalarda prognozu, hastanede kalış süresini, yaşam kalitesini ve sağkalımı etkileyen ve sık görülen bir problemlerdir.

Amaç: Bu çalışmanın amacı Gastrointestinal kanserli hastaların beslenme durumunu değerlendirmektir.

Yöntem: Araştırma tanımlayıcı ve kesitsel bir tasarım ile yapılmıştır. Irak'ın Bağdat kentindeki Al-Amal Ulusal Hastanesi, Onkoloji Hastanesi, Gastroenteroloji ve Hepatoloji Eğitim Hastanesi'nde 2020-2021 yılları arasında gastrointestinal kanserli 140 hasta ile yürütülmüştür.

Bulgular: Çalışma sonuçları hastaların %49,3'ünün malnütrisyon riski altında olduğunu, %30'unun normal beslenme durumuna sahip olduğunu ve %20,7'sinin yetersiz beslendiğini göstermektedir. Sosyal statü, ekonomik durum ve ailede kanser öyküsü olan hastaların MNA'ları arasında anlamlı istatistiksel bir ilişki vardır.

Sonuç: Kanserli hastaların malnütrisyon riski altında olduğu belirlenmiştir. Hastaların düzenli periyotlarda beslenme durumu değerlendirmelerine ihtiyaçları vardır.

Anahtar Kelimeler: Kanser, Malnütrisyon, MNA, Beslenme Taraması.

IDENTIFYING CHANGEABLE ELEMENTS OF MALNUTRITION IN ADULT CANCER PATIENTS

SUMMARY

AL-JANABI, Abdulrahman. Identifying changeable elements of malnutrition in adult cancer patients, Master Thesis, Çankırı, 2021.

Background: Malnutrition and weight loss are frequent problems in patients with malignant disease, affecting prognosis, length of hospital stay, quality of life, and survival.

Objective: To assess the nutritional status of patients with gastrointestinal cancer.

Methods: The study used a descriptive and cross-sectional design, and was carried out among 140 patients with gastrointestinal cancer in Al-Amal National Hospital, Oncology Hospital, Gastroenterology and Hepatology Teaching Hospital in Baghdad, Iraq through the period of 2020-2021.

Results: The study results indicate that 49.3% of patients are at risk of malnutrition, 30% of patients have normal nutritional status, and 20.7% of patients are malnourished. There is a significant statistical relationship between the MNA of patients with social status at p-value 0.005, economic status at p-value 0.016 and family history of cancer at p-value 0.029.

Conclusion: It was determined that patients with cancer are at risk of malnutrition. They need frequent nutritional status assessments at regular periods. Providing good care for patients will enhance their nutritional status and prevent health.

Key Words: Malnutrition, Cancer, MNA, Nutritional Screening

1 INTRODUCTION

In the twenty-first century, cancer is predicted to be the main source of mortality and the singular more important critical disruption to enhancing the average lifespan across every community on the worldwide. Cancer is the fundamental or secondary major reason of demise before reaching seventy years of age in ninety-one of one hundred and seventy-two nations, according to World Health Organization (WHO) estimates from the year 2015, In addition, it is placed 3rd or 4th in another twenty-two nations. (Bray et al., 2018).

In emerging countries, cancer is expected to increase by 70% in the next 25 years (Alwan, 2016). The top reason of fate among males and females globally, in both middling income societies and societies with a high level of income, is cancer. The cancer burden is also increasing in countries at all income levels as a result of population increase and aging, which occurs in all countries (Torre, Islami, Siegel, Ward, & Jemal, 2017). In 2018, around 18.1 million novel cases of cancer were diagnosed and 9.6 million cancer- regarding deaths happened across the board (Tayyem, Mahmoud, Shareef, & Marei, 2019).

Even though the frequency of malnutrition varies according to tumor types and localizations, as well as disease stage, the presence of malnutrition in people with cancer is higher than in the general population. This is due to cancer-specific characteristics as well as the treatment process (Thoresen et al., 2013). The nutritional state of malignancy patients is a significant component in determining whether or not to use therapeutic methods such as chemotherapy, surgery, radiation therapy, or other treatments. Specific to the gastrointestinal tract, cancers in this system pose significant risks to a patient's nutritional status due to the cancer itself, impairment of nutrient absorption, disruption of enzyme secretion, interference with the passage of intestinal contents due to the tumor, and/or complications from surgery of the gastrointestinal tract (Yoon et al., 2018).

Gastrointestinal cancer (GIC), which affects various organs in the system of digestive, inclusive the stomach, eosophagus, gall bladder, hepatic system, pancreatic, large and small intestine, anus, and rectum, is utmost frequently diagnosed cancer type in the world, accounting for about a quarter of all cancer cases. According to predictions from the WHO, the global incidence of cancer is anticipated to climb to

21.7 million statuses and 13 million fates by 2030, primarily as a consequence of population expansion and the process of growing old (Garla, Waitzberg, & Tesser, 2018).

GIC is responsible for 26 percent of all new cancer diagnoses and 35 percent of all cancer-related fatalities in the United States. In 2018, there were a predicted more than 4.5 million novel statuses of GIC and more than 3 million correlating deaths universal, according to the WHO. The large part of deaths and conditions passed off in Asia, come after by Europe and North America, rating for 26% of total cases and 23% of fates together (Arnold et al., 2020).

Patients suffering from GIC are particularly sensitive to malnutrition as a result of the unique characteristics of the disease. This form of cancer has significant effects on the digestive system, including changes in intestinal transit, uncontrollable vomiting, and early satiety, all of which have a direct impact on the process of absorption and digestion of food. As a result of these systemic complications, the patient is more susceptible to developing neoplastic cachexia, which is marked by gradual and uncontrollable weight loss that causes the musculoskeletal system to become increasingly compromised, resulting in rapid loss of fatty tissue, atrophy of visceral organs, and depletion of stored energy. Cachexia has the potential to impair the quality of life of patients while also shortening their overall survival (Prado & Campos, 2015).

1.1. Importance of the Study

Patients with malignant neoplastic disease frequently suffer from malnourishment and weight loss, which has negative impacts on their prognosis, duration of hospital stay, cost of healthcare, quality of life, and overall survival (Thoresen et al., 2013).

In cancer patients, malnutrition is a serious concern because of the nature of the illness and the therapies that are administered. As a result, it is critical to research the relationship between nutritional status and dietary habits that occur before, during, and after cancer therapy to understand and prevent the increase in mortality and morbidity among cancer patients (Suárez-Varela et al., 2018).

Patients with GIC frequently experience weight loss. Throughout anti-cancer treatment, and particularly after major surgery, nutritional condition deteriorates, increasing the likelihood of problems, decreasing tolerance, and affecting overall prognosis (Gavazzi et al., 2016).

Although prevalence has been dropping for decades of multiple, cancer of gastric (GC) continues to be the 5th utmost prevalent tumor in the worldwide and the 3rd major causing of cancer deaths among men and women globally (“Global Cancer Observatory,” n.d.(2018). Because GC is sometimes occurring without signs or symptoms, or it may manifest as just undefined symptoms in its initial phases, it is frequently misdiagnosed, resulting in delayed diagnosis and poor prognosis for the patient (Wadhwa et al., 2013).

Weight loss was observed between 31-87% of sick people at the time their initial diagnosis of malignancy, as well as the extent of the leakage of weight is closely related to the type of tumor (Gavazzi et al., 2016). One finding is that 15 percent of clients defined with gastroesophageal tumor experienced leakage of weight greater than 10 percent in the past 6 months, although malnutrition can occur in reach up to 80% of patients related with GC in stage of preceding (Deans et al., 2009).

Patients with different cancers, including GIC, are thought to stick more severe issues, like as diarrhoea, vomiting, frailty of the body, and dysphagia, as a result of digestive system involvement, affecting the metabolic processes of cancer and increasing the severity of malnutrition in patients with GIC (Garth, Newsome, Simmance, & Crowe, 2010).

Additional measurements of anthropometric such as index of body mass (BMI), mass of muscles, and mass of body fat may be supply more accurate acquaintance, while measurements of biochemical such as level of serum albumin are required to reduce the severity of symptoms and malnutrition in patients (Atlan et al., 2017).

1.2. Problem Statement

Patients with gastrointestinal cancer may have weight loss and malnourishment as a result of the disease's involvement in the digestive system, the type of cancer treatment they receive, and the disease's complications and side effects. Furthermore,

the elderly are particularly prone to malnutrition due to their reliance on others in their daily activities and their inability to consume a variety of foods. To decrease or prevent risk, it is critical to analyze the nutritional state of this population, recognize any health problems, and provide management to help them.

A rapid epidemiological and nutritional transition is taking place around the world, with chronic malnutrition and obesity on the rise. One of the most significant challenges to overcome is a shift in eating habits and lifestyle toward a more nutritious diet and frequent physical activity. Despite the fact that this problem has not been resolved in Iraq (Alkhalidi & Alshemerty, 2018).

1.3. Objective Of The Study

In this study, the goal was to determine the status of nutritional of patients with gastrointestinal tract (GIT) cancer.

1.4. Hypotheses

- Is there no statistically clear link between demographic or social changeable and malnourishment among adult people who had cancer in Iraq?
- Among adult who had cancer patients in Iraq, is there no significant correlation between the modes of therapy they get and their dietary patterns?
- Among adult who had cancer patients in Iraq, there is significant correlation between the modes of therapy they get and their dietary patterns?
- Is there an evidence exists to suggest that a low diet of meat and dairy products is affined with a higher level of exposure of malnourishment among Iraqi cancer sufferers above the age of 50?

1.5. Various Forms of Malnutrition

Malnutrition is referred as a case in which a person's intake of energy and/or nutritious is decreasing, excessing, or imbalanced. The term malnutrition lead to a burden range of disorders, comprising undernutrition, excess, obesity, and eating plan noncommunicable diseases, as well as micronutrient-related malnutrition (deficiency in micronutrients) (World Health Organization, 2021).

Undernutrition is defined as the consumption of energy and nutrients that is insufficient to encounter an individual's requirements for maintaining health.

Undernutrition and malnutrition are frequently used interchangeably in the literature (Maleta, 2006). Undernutrition is classified by the WHO (2021) into several broad sub-types of undernutrition: Low weight-for-height is sign to as wasting, stunting is sign to as low height-for-age is sign to as underweight is sign to as children that are underweight for their age may be stunted, wasted, or both, and may suffer from vitamin and mineral shortages.

Disease-related undernutrition tends to be a highly widespread condition in healthcare institutions, impacting 15-60 percent of patients admitted to hospitals, According to the literature, the metabolic consequences of implicit disease, as well as dietary intake inadequacies, are the most common causes of disease-related undernutrition detected at the first time of hospital entering , Evidence propose that other core peril factors, including as aging population and decreasing levels of education as well as poverty and residing alone, are also associated with the condition (Amaral et al., 2010).

Overweight and obesity are conditions characterized by abnormal or extreme fat buildup and are regarded to be harmful to one's health. With an estimated 2.8 million deaths per year among adults, overweight and obesity are regarded to be the 5th biggest cause of mortality worldwide. Overweight and obesity are very well risk factors for raising the prevalence of a variety of chronic diseases, including cardiovascular disease, diabetes, and malignancies, among others (Shabu, 2019).

According to the finding of the 2015 Iraq national STEPS survey, which was conducted to determine the incidence and linked of overweight and obesity among Iraqi adults, approximately two out of every three participants were overweight or obese, and this was associated with several peril factors, inclusion sociodemographic (age, female sex, low educational level, greater socio - economic status, and region of residence), and high blood pressure (Pengpid & Peltzer, 2021). According to Iraqi literature, a significant frequency of obesity was discovered as a result of economic changes and habits, as well as past laparotomy and the item of clothing gown inside the home, among other factors (Al-Tawil, Abdulla& Abdul Ameer,2007; Jasim, Abdul Hussein & Al-Kaseer,2018).

Inadequate intakes of micronutrients have direct consequences for individuals and indirect consequences for communities. Micronutrients are a general word that refers to the minerals and vitamins that are necessary from the diet in order to maintain practically all normal cellular and molecular activities, including reproduction. In spite of the fact that micronutrient requirements are quite low, micronutrient insufficiency can have widespread severe health consequences that, if left untreated, will eventually result in death if not addressed. Approximately 2 billion individuals worldwide are thought to be suffering from micronutrient deficiencies. The most frequent micronutrient deficiencies are those involving iodine, vitamin A, iron, iodine, folate, and zinc; however, there are various additional micronutrient deficiency illnesses that can occur as well. It is common for various micronutrient deficits to coexist at the same time. Micronutrient deficits are frequently encountered as a consolation of a malnutrition cycle, and they may be sharing with proteins or energy deficiency (Bailey et al., 2015).

Nutrition-related no communicable conditions are the command reasoned illness and demise in the majority of nations in the Eastern Mediterranean region, Cardiovascular disease, diabetes, and tumor are among the most common, hypertension, total cholesterol levels in the blood, cigarette use, poor eating habits, being overweight or obese, and being physically inactive are the most potential risk factors for these no communicable illnesses. Another factor associated with nutrition-related no communicable diseases in this region is the region's demographic and socio - economic situation (Musaiger & Al-Hazzaa, 2012).

1.6. Important of Nutritional care

An individual's overall outcome during hospitalisation is significantly affected by the presence of malnutrition in a surgical patient. The serum albumin level at the time of admission was found to be important correlation with subsequent morbidity and demise in a multi-centric prospective trial. This association was not limited to surgical patients alone, but was found in individuals from all medical specialties. This is understandable when you realise that starvation has a negative impact on immunological function as well as tissue healing capacity. In this case, according to European recommendations, patients who are at high nutritional peril cons from

nutritional care for less than two weeks before procedure day. It is preferable to use the enteral route whenever it is possible (Weimann et al., 2006).

Several studies have been published to provide evidence in support of these recommendations. Previous research has looked into the influence overall dietary with patients having operation, and some of these studies have found that the post-operative nutrition are associated with decrease grade of morbidity after surgery. Furthermore, it has been shown to be useful in lowering mortality. Malnourished patients having gastrointestinal surgery can benefit from both parenteral and enteral nutritional assistance, and their combination may be used to improve their overall nutritional status (Torosian, 1999; Klein et al., 1997).

Patients with GIC who are somewhat or extremely malnourished may gain from perioperative nutrition therapy, which can lower the chance of developing postoperative problems and improve their overall health (Wu, 2006).

Nutritional deficit has shown to be a significant driver of the healing of postoperative problems in several studies. Client experience GI operation at peril of nutritional depletion as a bad outcome due to surgical, and the resulting rise in metabolic grade after the procedure. Scars of surgical ileus and the durability of the novel built anastomosis have resulted in a therapy regimen that normally consists of fasting combined with intravenous fluid administration until the passage of flatus has occurred. In recent years, however, it has been demonstrated that post-operative enteral feeding is both efficacious and well bear. Aside from these general advantages, enteral feeding has been linked to particular clinical advantages such as a lower occurrence of post-surgery infection problems and an enhanced injuries caring response. Significant decreases in diseases and deaths related with perioperative complete parenteral nutrition have been demonstrated in studies in patients with gastrointestinal cancer who are extremely malnourished. In comparison to parenteral nutrition, meta-analyses have indicated that enteral nutrition is joined to lower sepsis sequelae and a shorter hospital stay. As a result, it should be used whenever possible as a first line of treatment whenever practicable. Although there is limited guide to hold up preoperative dietary support, it appears that if malnourishment persons are

sufficiently fed for at least seven–ten days before to surgery, the surgical result can be improved (Ward, 2003).

GIC participants underwent abdominal surgery are now advised to receive before procedure oral immunonutrition (omega-3 fatty acids, arginine, and nucleotides) to boost their immune system (Weimann et al., 2006).

any endeavour should be taken to boost caloric getting and block therapy related with lack of weight and suspension of radiation action, according to the ESPEN advises on enteral nutrition of patients receiving external beam radiotherapy or chemo radiation. for all that regime enteral nutrition is not bespoke when chemotherapy or radiation therapy, thorough nutritious counselling as well as oral nutritional supplements are bespoke throughout these treatments. Enteral nourishment should only be administered if significant local microsites is anticipated as a result of oesophageal irradiation (Senesse et al., 2008).

Providing oral nutritional support to all patients getting neoadjuvant treatment should be considered a best practise. However, there is only a limited amount of research accessible, particularly in the domain of GIC. A recent research found no variety in fatality between oral nutritional hold up or enteral tube nutrition matched with regime care in patients receiving chemotherapy or radiotherapy; however, oral nutritional holds up benefit raising dietary intake in patients undergoing radiotherapy when matched up with routine care in patients undergoing chemotherapy or radiotherapy (Elia et al., 2006).

1.7. Limitations

- Time limits: 2021.
- Place limits: Baghdad, Iraq.

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2. LITERATURE REVIEW

2.1. Gastrointestinal Cancer

Cancer is most common worldwide, affecting both economically developed countries less and more. The load of cancer is forecast to expand intercontinental as the world's population increases and ages, in particular in less advanced societies, where nearly 82% of the world's citizens resides. Increasing rates of adoption of lifestyle behaviors involving cancer risks in developing countries, such as unhealthy eating habits, physical inactivity, tobacco, and reproductive changes (such as lower parity and later age at first birth), contribute to the rise in cancer rates in less developed countries (Torre et al., 2015).

The worldwide burden of cancer is increasing, as is the incidence of cancer. Tumors originating in the gastrointestinal tract (GIT), such as those of the stomach and colorectum, as well as the liver, are among the five utmost predominant cancers in both gender around the world. Colorectal cancer is the 2nd extreme predominant cancer in women post stomach cancer, and is the 2nd extreme frequent tumor in men. Colorectal tumor is the third most prevalent malignancy in men, trailing only stomach and liver tumors in incidence. Cancers of the gastrointestinal tract, such as those of the stomach and liver, are the extreme prevalent reason of cancer-correlated death in men. Cancer of colorectal (CRC) is the third extreme common reason of cancer- correlated death in females. (Dizdar, & Kılıçkap, 2019).

The cancer incidence and the rate of mortality are continuing to rise, and cancer is a major threat to human life and health on a global scale. In China, stomach cancer is the second master why of morbidity and mortality, trailing only cancer of lung in terms of incidence and mortality (Chen et al., 2019). Patients with malignant tumors were shown to lose weight and suffer from malnutrition in 50 to 90% of cases according to studies (Thoresen, Fjeldstad, Krogstad, Kaasa, & Falkmer, 2002).

The fact that GIC patients have significant frequency of malnutrition is due to the tumor's location (Wie et al., 2010). In addition to dying from the malignant

tumor itself, around 20% of patients die as a result of malnutrition and accompanying consequences (Guo et al., 2020).

Approximately 4.8 million novel occurrences of GIC and 3.4 million correlating dying were projected to have occurred in the world in 2018. Generalized intestinal malignancies (GIC) computation for 26% of the world tumor incidence and 35% of all cancer- concerning death-rate (Arnold et al., 2020).

Patients suffering from gastrointestinal cancer are particularly prone to malnourishment because of the unique characteristics of the disease (Prado & Campos, 2015). This form of cancer has significant effects on the digestive system, including changes in intestinal transit, uncontrollable vomiting, and early satiety, all of which have a direct impact on the absorption and digestion of food (Tisdale, 2001).

2.2. Nutrition

Nutrition is an important component of health, and appropriate nutrition has a critical role in maintaining good health in the long run. Many factors influence nutritional status in elderly people; the aging process is associated with appetite of decreased and energy expenses, as well as come down in physiological and biological roles like as changes in cytokine and hormone levels, diminutive mass of lean body, fluctuations in fluid electrolyte system, poor dentition, slow gastric emptying, and diminution of the sense of smell and taste, amongst other factors. Also contributing to the complicated etiology of malnutrition in the elderly are chronic diseases and psychological ailments such as depression, dementia, and cognitive impairments (Ahmed & Haboubi, 2010).

Nutritional requirements for older people include the following (Midline Plus, 2018; Klemm, 2020):

- Consume an unlike range of foods from each of the groups five dietary. There should be lots of greens, legumes/beans, and fruitiness; grain (cereal) foods, spicially wholegrain, and high-fiber kinds, all of which should be low in fat or nonfat.
- Maintain sufficient hydration by consuming (6-8) goblets of fluid through the day.
- Heavy of foods in filled fat, as cakes, biscuits, pies, confections, industrial meats, pizza, burgers of commercials , potato chips, pan-fried foods, crisps,

and other variable snacks, should be consumed in moderation or avoided altogether.

- Those high in fat and chiefly filled fat should be offered with foods high in poly / mono unsaturated fats. Shift unsaturated fats like spreads, oils, nut butters and others.
- Limit intake of processed meals and beverages that contain added salt, and avoid seasoning dishes with salt while preparing or serving them at the table.
- Avoid sugary foods and beverages, like as confectioneries, sugar-sweetened soft drinks and cordials, fruit juices, vitamin or energy drinks, and sports drinks that include added sugars.
- Keep alcoholic beverages to a minimum (2 standard drinks per day is the maximum amount to consume).
- Keep 'extras' and 'occasional foods' to a bare minimum - they should not be included in a balanced diet regularly. Extras are foods that have high levels of sugar, fat, and salt.
- Engage in some form of physical activity. (target to do at less thirty minutes of physical activity in day, such as walk.)

For adults of any age, the recommended of dietary requirement for protein is 0.8 g /kg of weight per day, unthinking of gender and age . This is the bare minimum amount of protein that must be consumed daily to dodge gradual lack of lean muscle mass. Guide has shown that increasing intake of protein above the recommended of dietary requirement helps to enhance muscle growth, strength, and roles in older persons. Moreover, this supplementation may be help to boost immunological functions, wound healing, and blood pressure levels (Wolfe& Miller, 2008).

Older people are more susceptible to vitamin and mineral deficiencies because of reduced consumption and an imbalanced diet. Medications can interfere with vitamin absorption and hepatic metabolism, leading vitamins to be eliminated more slowly than otherwise. Smoking was shown to interfere with vitamin absorption, notably vitamin C and folic acid. As a result, older adults are more susceptible to hypervitaminosis, and their dietary requirements are higher as a result of decreased skin production, limited exposure to sunshine, and thinning of the skin (Ahmed Haboubi, 2010).

2.3. Malnutrition

Malnutrition is a serious concern among the elderly population, as evidenced by its rising contribution to mortality and morbidity rates (de Moraes et al., 2013). Malnutrition is a common symptom among cancer patients, and it can result in accidental weight loss due to insufficient nutrient intake or absorption (Arends et al., 2016). This condition has a significant impact on various elements of cancer treatment and outcome, including increasing treatment toxicity, lowering treatment intensity, worsening patients' quality of life, and eventually compromising their long-term survival (Bossi, Delrio, Mascheroni, & Zanetti, 2021). The recrudescence of malnutrition in patients those have cancers is thought to range between 40 and 80% during the course of the illness. Furthermore, malnutrition can have an impact on treatment outcomes, as it can cause delayed wound recuperation, impaired muscle tasks, and increased hazard of postoperative complexities. It may be also affect forbearance and responsiveness to anti-cancer therapy, that can result in longer hospital stays, increased chance of treatment interruptions, and a probable reduction in overall survival (Ravasco, 2019).

Malnutrition is described as a state of deficiency in the energy, protein, and other particular nutritive, which results in a major alteration of biological functioning (Ryu, 2010). The utmost dangers for post-operative consequences and modulations in nutritional status are present in GIC patients who undergo main optional procedures. These risks are particularly high in patients who experience surgical tension, suppression of immune caused by cancer, or received blood transfusions in the previous year. Malnutrition is the most significant of these concerns due to its more incidence and detrimental influence on clinical conclusions, as hospitalization and fatality (Pozniomyck et al., 2016).

The latter is significantly more closely associated with malnourishments than cancer isolated, and it can occur in as many as 20% of conditions, nearly half of patients these injuries with malignancy are malnourished, and in the statuses of CIC, the fate rate changes from 30 to 50%, reaching 80% in statuses of forward pancreatic cancer (Sungurtekin, Sungurtekin, Balci, Zencir, & Erdem, 2004).

Malnutrition is interpreted as a medical problem caused by a lack, an excess, or poor absorption of nutrients by the body's tissues. Malnutrition is a disease state caused by a diet that is deficient in one or more essential nutrients or by malabsorption of food. Malnutrition is present in around 50% of cancer patients at the time of

appeared, and in an additional 80% of cancer patients during advanced disease. Several factors influence this condition, including the type of tumor, stage, treatment, and the dietary situation of the patient at the first time of diagnosis (Alemu, 2019).

Protein-energy malnutrition is caused by a change in the amount of protein and energy consumed and the amount of energy required by the body. This imbalance leads to tissue loss, particularly in the case of muscular tissue, which has negative functional implications. Malnutrition in the adult produces or aggravates a condition of frailty and/ dependence, and also leads to the increase in morbidity in this population. The use of tobacco products is also connected with a deterioration of the prognosis of latent diseases and an increase in the risk of death. With increasing age, the incidence of protein-energy malnutrition increases. Among older people living at home, it ranges from 4 to 10%; among those receiving institutional care it is from 15% to 38%; and among those receiving hospital treatment it ranges from 30% to 70% (Hengeveld et al., 2018; Dwyer et al., 2020).

Individuals 'those suffering with cancer are at nearest risk of malnutrition as a result of the disease consequences as well as the treatment regimen, which is typically intense. The nutritional status of cancer patients is influenced by a variety of cancer-related issues, inclusive systemic inflammation and hypoxia stress (Inácio Pinto et al., 2015). Patients may already have lower dietary intake before anticancer treatment, and in addition, adverse effects of cancer treatment, such as nausea and vomiting, may be present. Symptoms such as a decrease in appetite, dry mouth, or nausea are related to lower energy intake (Torbahn et al., 2020).

Adult people with cancer face additional complications as a result of their increased chance of developing other weight-loss diseases, such as sarcopenia and cachexia as a result of their illness or other co-morbidities. Cachexia, sarcopenia, and malnutrition are all diseases with clinical manifestations and diagnostic criteria that are quite similar. However, because malnutrition is primarily concerned with the 'intake and uses' of nutrition, a screening technique that can also detect difficulties with oral intake is necessary (Bullock et al., 2020).

2.4. Variable Causes Malnutrition

2.4.1. Sociodemographic Variables

The nutritional state of older individuals is the compound interrelationship social, nutritional, financial, physical, and cognitive variables, Among other things (Locher et al., 2008). Numerous factors, including; years old, sex and profession, schooling, civil status, income level, cigarettes, consumption of alcohol, sleep length of time, diet and lifestyle habit, pharmacotherapy, illness and swallowing disorders, and family medical history of malnutrition are all point to be notably linked with nutritional status in older people (Poda et al., 2019).

For a variety of reasons, older persons are particularly vulnerable to malnutrition, The drop in desire and Consumption of food that occurs as a conclusion of ageing is related with poor nutritional status, as seen by losing the weight, a lack of financial support, and insufficient availability to food (Ahmed &Haboubi,2010).

In terms of gender, numerous research has indicated a relationship between nutritional status and feminine gender. This could be due to variables such as the place of female in society and the financial situation of women dependence, both of which have an impact on nutritional health in health-care facility (Donini et al., 2012; Boulos et al., 2013).

Rural life in poor countries may come with a number of additional difficulties. Indeed, multiple studies have established that senior persons existing in pastoral territories have bad health issues, are low knowledgeable, and have lower levels of income when compared to elderly individuals residing in urban areas, according to the findings of the studies (Hartley, 2004). They encounter a number of unique challenges, including a lack of readily available transportation, health spaces or setting, and public services, among others. pastoral dwellers, on the other hand, may benefit from greater communal assistance (Inder et al., 2012).

Furthermore, rural communities face higher levels of low socio - economic status, as evidenced by lower wages and fewer levels of educational attainment than their urban counterparts. Older people who grew up in rural locations have poorer health when compared to those who live in urban areas, since people are living shorter lives and greater ranges of disease or illness. folks who live in rural locations have unique problems that have an impact on their health, such as far about public live and restrictive getting to transportation, institutions, and services. Because of the

cumulative influence from inward migration of senior citizens and outbound emigration of young folks. In comparison to metropolitan regions, remote areas have a higher number of older folks, rendering them more sensitive to the problems involved with an elderly society (McNaughton et al., 2012). Adults who are restricted to their places for a variety of situation, enrollment geographical position, a transportation problem, functional restrictions, or medical issues, may get at greater chance of developing malnutrition. As a conclusion of their already poor health status due to a health issue and are getting formal home health services, approximately 50 percent of them have previously been admitted to a hospital, can be at even greater sign of bear undernutrition (Payette, 2005).

Poverty is a significant socioeconomic contributor to poor diet intake in older folks, because folks who had restricted earnings are unable to buy the diet they require or, in the condition of homebound folks, are unable to pay to have meals delivered to their residence (Lee & Frongillo, 2001).

Social aspects are particularly important in the case of homebound older persons who are incapacitated and reliant on others for the acquisition, preparation, and consumption of their meals. Some research has revealed that older persons who have adequate social networks and support systems have favorable nutritional outcomes, and this demonstrated by several review (Davis et al., 2000; Locher et al., 2005). The importance of support of public or social challenges may also be affected by type of sex norms and previous widowhood, to name a few factors (McDonald et al., 2000).

When compared to nonsmokers, smokers reported worse adherence to the Dietary Reference Intakes for iron, element of phosphorus, vitamin C, riboflavin, and folate than those who did not smoke. In contrast to prior studies comparing smokers and nonsmokers, neither group had a greater or lesser body weight than the other. A number of nutrients were observed to be consumed at levels lower than the Dietary Reference Intakes by both smokers and nonsmokers. While smokers' reported nutrient intake was much lower than that of persons had not smoking for critical nutritious, those were also more clearly than nonsmokers to fall short of the Dietary

Reference Intakes for sedentary nutrients, putting them at an elevated chance of chronic disease (Raatz et al., 2017).

Especially given the fact that the prevalence of tobacco using has reduced with the passing years, it remains single of malady of morbidity and dying and a possibility factor headway of habitual diseases such as tumor, cerebrovascular problems, cardiovascular disease, diseases of respiratory (including bronchitis and pneumonia) and others (Yanbaeva et al., 2007). Many of the chronic diseases connected with smoking are also controllable through dietary modifications. Previous research has demonstrated that folks who smokers are slimmer and the nutritional content of smokers' dietary is significantly worse than that of nonsmokers (Audrain-McGovern & Benowitz, 2011).

When compared to older non-smokers, smokers had a poorer nutritional status because they ate fewer meals per day and were underweight more frequently than those who did not smoke. Because of the negative influence that eating patterns and smoking have on wellness, older smokers should receive special attention when it comes to their nutritional state (Vilela et al., 2018). Many researchers have found that many people' nutrient intake falls below recommended levels, and smokers report dietary behaviors that are low amount of nutritious than those folks who not tobacco using, according to the findings of these studies (Larson et al., 2007).

In academic achievement, several prior research found that the frequency of bad nutrition and the risk of it was higher among lesser literate adult individuals and lower among adult who getting a good level of education educated, respectively (Timpini et al., 2010; Hoogendijk et al., 2018). It was also discovered that people with little education and those who live individually are at a high risk of having malnourishment (Pirlich et al., 2005). Moreover, according to the outcomes of a recent Polish research, a reduced academic level was not an important evidence for getting malnutrition (Krzymiska-Siemaszko et al., 2014).

When someone drinks alcohol, the beers must first travel along the various organs of the GIT. Therefore, consuming alcohol may have a consequence on both the anatomy and of vocation gastrointestinal tract parts. Prejudice to the mucosal inside of digestive tube caused by alcohol raises the likelihood of developing esophageal

cancer as a result. Alcohol has been shown to impair gastric acid output as well as the functioning of the muscles around the stomach in the stomach. The consumption of alcoholic beverages may affect the action of the muscles in GIT, sharing to the diarrhea that is repeatedly noticed in alcoholic's folks. Alcohol impairs food sucking in the GIT and promotes the transfer of element toxins through intestinal body, both of which may denote to the evolution of alcohol-related with herpetology disorders and other parts in the body (Bode & Bode, 1997).

Chronic alcohol consumption, as well as acute alcohol drinking, may result in malnourishment by low caloric consumption, weaken absorption food digestion, lowering presses synthesis and secretion of proteins. It is dependent on the amount of drinking, the particularity of the diet ingested, heredity, and the existence and grade of concomitant conditions that determine the degree of malnutrition. When alcohol accounts for more than 30% of total calorie consumption, the likelihood of having micro- and macronutrient deficits rises dramatically, according to research (Lieber, 2000).

Deficiency, including both nutritional deficits and energy of protein in specific nutrition, is a common consequence of liver disorder, particularly in the elderly. The severity of malnutrition is inversely proportional to the gravity of alcoholic liver case. Malnutrition can occur in patients with cirrhosis for a gravity of reasons other than alcohol consumption. It is likely that malnutrition is caused by a variety of factors, and it extremely aggravate in the hospital as a consequence of fasting for procedures and metabolic outcomes of herpetology disorders (McClain et al., 2011).

2.4.2. Global Variables

With rising age, the number of medications prescribed, as well as Increases in the prevalence of drug dependence are observed. It is vital to evaluate the drug regimen on a regular basis to protect minimise potentially hurtful consequences and to maximise medicament effectiveness (Jyrkkä et al., 2006).

Both over counter and prescription drugs have the prospect to induce unfavourable outcomes that can have an action on a person's ability to eat well. Anorexia, constipation, diarrhoea, and modifications in the perfect taste and sense of smell are just a few of the negative effects of this medication (Brownie, 2006). In

additionally, a number of drugs have been shown to interfere with diet and cause a decline in the absorption of certain nutritious in the body. Both of these issues have the prospect to have a negative action on one's nutritional case (Santos & Boullata, 2005). In the context of malnutrition or in the presence of gastrointestinal tract dysfunction, these difficulties are amplified even further. Because older persons are more likely than teenagers to take drugs, the action of pharmaceuticals on nutritious consumption and diet status may be important in this population (Jones, Duffy, Coull & Wilkinson, 2009).

There are several ways in which medications can affect nutritional status, including anorexia, diminished or convert taste, oral cavity dry, disorientation, GIT disturbance including disgust, puke, looseness of the bowels, difficulty in emptying the bowels and dyspepsia. mistaken medication administration can also result in complications, such as hyper metabolism when thyroxine and theophylline are administered incorrectly (Pirlich & Lochs, 2001).

Amounts ranging from 10 percent to 55 percent of sick persons in hospitals and the community have been documented in food-sufficiency zones. In order to manage illness-related malnutrition, it has been proposed that dietary guidance emboldening the consumption of good energy- and nutritious-dense nutriment more than oral nutritional supplies be followed (Baldwin & Weekes, 2011). The ability to prepare and consume food on one's own was found to be associated with an improvement in dietary patterns (Shatenstein et al., 2001a).

Malignant disease and dietary patterns are intimately related because the symptoms induced by illness, join with subaltern problems, and the tumor medicines all enhance the likelihood of having a nutritionally deficient state after cancer treatment (Muscaritoli et al., 2021; August & Huhmann, 2009).

The involvement of psychological disorders in cancer patients, such as sadness and anxiety, might create challenges to manage and treat the disease and its symptoms (Walker et al., 2014). The incidence rate of depression in folks who had tumor is two to three times greater than in the society (Linden et al., 2012). The rate of stress or depression and anxiety among folks with tumour can reach up to 20 percent

and 10 percent, respectively, depends upon item such as the phase of the illness and the stage of management (Mitchell et al., 2011). As a result, some researchers believe that the prevalence is higher, particularly among cancer patients who are receiving palliative care (Světláková et al., 2019; Calderon et al., 2018).

The existence of depression is connected with poor sponsorship to tumor therapy and a shorter overall life expectancy (Pitman et al., 2018). It has been shown that having both anxiety and depression disorder increases your risk of dying, and that having them together increases your risk much more (Shim et al., 2019). Patients with cancer who were anxious or depressed were more likely to attend the critical unit or be admitted to the hospital, were hospitalised for longer periods of time, and incurred higher healthcare expenses (Mausbach et al., 2020).

In cancer patients, a link has been shown between bad nutrition and mental disturbance. In clients who are experiencing losing weight and other signs of malnourished, they frequently declaration increase levels of mental discomfort, which manifests itself as more acute lassitude and sleeplessness, as well as depression and depression, so adding to the progression of the condition (Holland & Alici, 2010). There is overlap between the characteristics of malnutrition and mental distress, but few research has examined the association between the two, with depression and anxiety being the disorders atoms extremely cited by clients as attributing to the aspect of malnutrition (Ma et al., 2013). In the case of depression in particular, there have been studies that show a link between depression and reduced food intake, losing weight, and malnourishment (Zhu et al., 2018). Symptomatology of depression are common among cancer inpatients, the presence of malnutrition is associated with the presence of worried and mental symptomatology in folks who had tumor admitted to a cancer hospital (Sánchez-Torralvo et al., 2021).

People suffering from cancer are frequently undernourished. It has been shown that social and psychological difficulties might exacerbate physical and metabolic alterations (Marin Caro et al., 2007). Psychological issues, such as cognitive impairment and depression, have also been found to participated to older persons' weaken eating habits and low intake. Some of the most common nutritional challenges experienced by older persons with mental disorders inclusion eat forgetting, not being able to attend meals, and outright disagree to consume food. Although stress or

depressive is connected with decreasing calorie consumed in all live, homebound adult individuals who contact with multiple variation and casualties over a short life during their end time in life are more tolerable to bear from it than other year groups (Elsner, 2002; Johnson & Fisher, 2004).

In addition to low mood and appetite, high sorrow and mental stress, and a decreased solicitude in pleasure pursuit, depression is also connected with a variety of physical symptoms. Depression symptoms are regularly observed in adult cancer patients; however, they are frequently misdiagnosed. For example, a patient suffering from depression can be have difficulties feed and drinking at uniform times. An investigation into the association between hunger and depression has been carried out in a number of research. Both correlative and intricate, the link between depression and hunger exists. Patients suffering from depression may be undernourished (Saka et al., 2010).

Alzheimer's disease, depression, and malnourishment are all conditions that can occur. Distress, deprivation and grief, cognitive deterioration, and insanity are conditions that have the potential to raise the risk of malnutrition in some people. In people suffering from depressive presentation or insanity, the recrudescence of bad nutrition rises by 32 percent and 29 percent (Zhang & Edwards, 2019).

Malnutrition was found to be associated with low cognitive condition and insanity, which were proven to be statistically cleat link shown as risk item (Mamhidir et al., 2006). The researchers at Feldblum et al. (2007) discovered that decreased cognitive function, a lower educational level, and chewing difficulty were all predictors of malnutrition in older medical patients.

Considering that the epidermis is the primary part in the parts of body, the nurse's responsibility is to ensure that the epidermis wetness block task is not compromised at any time. Due to the fact that older persons' skin is more sensitive, caution should be exercised when caring for them in health facilities. Nurses and other care providers should be learning that nurture might have an effect on tangible excretions and, as a result, accretion the peril of developing a skin sore or ulcer.

Ulcer of pressure is a limited damage of dermis and attached cells and tissue that occurs above a part of the body as a consequence pressure combined with shear. Pressure ulcers are most famous in old age. It results in ischemia, gradual deterioration, and soft tissues of necrosis under the skin's surface. Pressure ulcers are devastating chronic wounds that commonly affect adults over the age of 65, who have physical or cognitive disabilities, or who have many chronic conditions. It is a widespread condition among older persons in all healthcare institutions, and it is particularly prevalent in nursing homes (Neloska et al., 2016).

Pressure ulcers are severe chronic wounds that can be life-threatening. Skin sores or pressure ulcers in hospitalised elderly people are a major public health concern, and their prevention necessitates a thorough understanding of the risk factors. In order to effectively manage malnutrition, coordination between several clinical specialties and among all members of the clinical team is required (Tappenden et al., 2013).

Nearly one to three million of folks America incubate ulcers of pressure each year, of them, more than a million and a half of them lie in various care centres, the mortality rate is 60,000 per year due to the social and medical characteristics associated with pressure ulcers (Lyder et al., 1998). A prevalence rate of pressure ulcers in general acute care was 10 percent to 18 percent between 1990 and 2000, on the report of the National Pressure Injury Advisory Panel, 2.3 percent to 28 percent in various care centres and up to 29 percent in setting of services, and 0 percent to 6 percent in rehabilitation care during that time period (Saghaleini et al., 2018).

When it comes to care facilities, the dispersal of skin sores or pressure ulcers field from 11-29 percent. Progressive ulcer of pressure in inpatients aged people is multiplex and multifaceted in its occurrence and progression. In terms of predisposing variables, they can be split into two types.: intrinsic (such as physical activity or mobility limitations), and extrinsic (such as comorbidities, nutritional deficiencies, and ageing skin) (e.g., friction, pressure, incontinence) (Horn et al., 2004; Neloska et al., 2016).

Nutrition is vital in maintaining tissue viability and skin preservation, which are both essential in the prevention ulcers of pressure and the rehabilitation of existing

ulcers (Posthauer, Banks, Dorner, & Schols, 2015). A facility care services Residents are more vulnerable to the development of ulcers and high blood pressure as a result of their co-morbidities and nursing home placement (Yap et al., 2013), and it peril is typically exacerbated by the presence of a reduced nutritious status, which is not resolved peril factor in many cases (Thomas, Ashmen, Morley, & Evans, 2000).

Age-related changes, such as decreased or absent appetite, have an impact on the ability of older persons to maintain a sufficient nutritional intake throughout time. Citizen strength to preserve nutritious at a range that preserves epidermis integrity and saves tissue tolerance is known to be hampered by action variable such as an insufficient quantum of food portions, difficulties relocate and food sinking, also low level of perception (Yap, Rapp, Kennerly, Cron, & Bergstrom, 2015).

Pressure ulcers can also have a bad bear on overall life quality because of the pain, the treatments required to treat them, and the length of time spent in the hospital. Furthermore, they are connected to a rising rate of demise in some patients (Lyder, 2003). A previous study found that underfeeding and/or weight loss prior to the development of pressure ulcers was a favourable predictive predictor for the development of pressure ulcers (Fry et al., 2010). Another study discovered a statistically significant relationship between unexpected weight loss (5 percent –10 percent) and the instigation of dermic ulcers in the adult (Shahin et al., 2010).

Although of appropriate ingestion to encourage granulation tissue formation is uncertain, higher requirements for capacity or energy, element of zinc, protein, and the ascorbic acid, retinol, Alpha-tocopherol vitamins, that observed in wound healing patients, among other things. Studies have demonstrated that high-protein oral nutritional supplements can significantly bring down the happening it in people at range by 25 percent when taken orally (Raffoul et al., 2006). According to a recent European Society for Clinical Nutrition and Metabolism guideline may introduce to enteral/oral diets in polymorbid medical patients with bedsores in order to speed the healing of bedsores (Gomes et al., 2018).

Increased wound dehiscence is caused by protein-energy deficiency, which diminishes activity of fibroblastic cellular and late angiogenesis in the

proliferative phase and lowering collagen production and bad uration in the remodelling course, respectively. Protein is also missing in injuries exudates, which can build to 100 g/day of protein and can be lost in the process (Russell, 2001). The association between bad nutrition and pressure ulcers has been affirmed in a number of investigation to be bidirectional (Günes & Efteli, 2015; Park, 2014). It has been discovered that there is a clear link between the severity bad nutrition and the development of surface ulcers (Park, 2014).

A rise in morbidity and mortality, as well as elevation readmission rate, roles limitations and physical difficulties, are all related with hospital malnutrition, which results in an increase in healthcare expenses. Nutritional deficiency is closely associated with frailty, a clinical syndrome accompanied by high weakness of health outcomes such as illness, a descend in physiological quality, and an augmentation peril for inability, accidents of falls (including fractures), admission to hospital, demand for long duration care and demise (Lelovics, 2009).

Clients s over the age of 65 are significantly more prospective than others to suffer from functional disability. The likelihood of recovering from limited mobility is lower in malnourished individuals, as is the likelihood of their functional handicap worsening. (LIM, 2018). The documenting of meal intake in clinical practice is often done by a nursing aid envisioning a dinner tray many hours ahead to the time of constrain and made an educated guess as to the percentage of food consumed. Because they overestimate meal consumption, health professionals frequently fail to notice between half and one-third of nursing home patients whose getting levels intake put them at peril for nutritional weight loss weight. This is due to certified nursing aides having emulation responsibilities during times of daily meals, as well as needing to rely on recollection after meals to rating meal consumption. (Simmons et al., 2002).

Residents' cognitive and functional abilities play an important element in determining whether or not they can utilize in feeding independently, whether or not they will demand set-up patronage, and whether or not they will be entirely reliant on nursing home or hospital train to prolong support. The optimum outcome for an

occupant who has lost the ability to feed himself or herself is for personnel to be fit to give the appropriate grade of sympathetic hand feeding as demand. An investigation of single or more meals will provide Employee knowledgeable in eating patterns, as well as whether there are swings in ability to self-feed throughout the day. When checking daily food consumption figures for possible changes in intake during breakfast, lunch, and supper, it is important to keep in mind the possibility of overestimation of meal consumption. The nursing home or hospital personnel can then concentrate on giving greater hand nurture assistance while eating during these meals with reduced calorie counts. When offering this support, nursing home or hospital trainer should be sentient of the most perception hand feeding approach to adopt. Especially in the condition of an occupant who has extreme cognitive or activities difficulties, open hand may be the greatest option because it demands the minimal compensate of capability from the occupant while yet encouraging the ultimate sizing of snack eating (Batchelor-Murphy et al., 2015; Kennerly et al., 2015).

Adults who face diminished strength to live without assistance as a result of functional and moveableness impairments may acquaintance with difficulties as a result of fractures, surgery, and immobility, as well as other factors (Choi & Lee, 2010). cuisine, retail store shopping, and tuning the table can all be difficult tasks for elderly persons who have visual acuity loss and are having difficulty doing daily chores like these. This circumstance has the potential to create a vicious cycle that results in malnutrition (Ezzat & Sally, 2010).

When developing a programme to increase mobility in people with disabilities, physicians should keep these considerations in mind. Furthermore, relying on an aged person's resolve to improve his or her nutritional health is a challenging proposition. correspondingly, public health provider must hold up ameliorate nutrition styles among adults at a population level. Nurses in charge of adult health administration should have in one's possession or grow vocational capabilities that would simplify their heed of all element pertinent to malnourishment in adult folks and capacity to assessing and diagnose malnutrition in its onset (LIM, 2018).

Dysfunction of sensory, such as vision loss, can result in impairments in movement and cognitive function, as well as the inability of a patient to initiate a separate life. It eventually has a negative impact on a client's overall goodness of life (Park et al., 2011). Several points of convergence exist between the fields of hunger and disability. Malnutrition and nutritional deficiencies are prevalent in many developing countries, and countries with high rates of disability and developmental delay are also common. There are various key areas of overlap and influence, including the following: It is possible that malnutrition will create or contribute to a number of different disabilities. It is also possible that malnutrition will cause or contribute to various disabilities (Groce et al., 2014).

The excess weight (obesity)-related illnesses such as stroke and diabetes are becoming increasingly important causes of disability, particularly in older age groups, is becoming increasingly clear (Wagner & Brath, 2012). In the past, there have been, obesity has swiftly emanated as a public health issue, even in resource-poor countries (Caballero, 2005). It is correlated with a raise peril of metabolic morbidity and stroke, with stroke ranking third among the main source of dysfunction-adjusted life years in the universe. Elderly who are malnourished or undernourished are more prospective to suffer from bone fractures, especially hip fractures, which can result in limited physical mobility. After an illness or accident, older persons may experience physical limitations that make it difficult for them to get or prepare meals for themselves. This can result in a shift in eating habits, which can contribute to increased disability in folks adult (Murray et al., 2012).

Relation of social dependence between functional and dietary position was identified among the older subjects who were studied in the present study. diminutive food using up, unfamiliar weight absence, disease-related stress, extent of personal, adequacy and utilitarian capacity were all shown be related with worsening nutritional condition (Oliveira et al., 2009). As stated by to previous study, a substantial number of elderly males and females are malnourished as a result of factors that have an impact on their daily activities, particularly mobility and style of feeding (Kikafunda & Lukwago, 2005).

2.4.3. Dietary Variables

Diet is vital role to maintain nutritional status, and people will lose weight if they do not consume adequate amounts of important nutrients energy and protein. In addition, if the fineness of the nourishment is insufficient and only contains little amounts of minerals and vitamins, there is a risk of developing nutrient deficiencies as a result of this. Having inadequate dietary intake will have an adverse effect on an adult folk practical and mental abilities, and hence on their capacity to cooperate in leverage of life styles. Because adult's individuals demand minimal energy, the nutritional content of their food is quite indispensable. It is also important to consider the texture of the meal in attempt to compensate for variations in chewing and swallowing abilities that occur with age (Jones et., 2009).

A significant predictor of bad hospitalisation outcome was found to be one's dietary habits (Kagansky et al., 2005). Lifestyle and diet, together with the achieving and maintaining a healthy weight, are essential in the preservation of health for people of all ages, but they are especially important for folks who hope for to live a long and healthy life. In terms of health and wellbeing, keeping a healthy nutritional status has major consequences for retardant and constriction the peril of acquiring disease as well as preserve functional autonomy, all of which contribute to the promotion of ongoing living independently (Mitra et al., 2018).

There are a variety of reasons why adult folks are at chief peril of dehydration, comprising raised losses via the epidermis as effect of thinned epidermis, impaired strength of the renal to concentrate urine, and a minimum sensible thirst mechanization. Many and varied repercussions of dehydration can be experienced, and the majority of these outcomes have an effect on daily diet and dietary patterns. The following are some of the consequences of dehydration in older individuals that can be have an influence on their nutritious state. higher risk of bedsores, disagreeable flavor in the mouth, sleepiness, lack of certainty, constipated, and a raised peril of urinary system infections. Therefore, when assessing and maintaining the dietary status of adult folks, it is critical to take fluid consumption into consideration. Adults should take 6-8 glasses of liquids every day, according to current recommendations

(may be change according climate). This can come from a variety of sources, but it should not be consumed in large quantities at once (Jones et al., 2009).

Malnutrition was found to be connected with swallowing problems. Because cavity of oral health condition did not have a contact relationship with bad nutrition, it is possible that maintaining swallowing function can help to prevent malnutrition in fragile old adults with limited mobility (Okabe et al., 2015). Adults' nutritional intake had clarified to be negatively impacted by a variety of psychosocial issues, including isolation, insomnia, dementia, and depression (Bloom et al., 2017).

Eating habits and appetite are closely related, and both are influenced by environmental and social variables, as well as by internal biological mechanisms. zest is the inner driving force that motivates the search for, selection of, and consumption of nutritious. Human appetite can be assessed in two different forms; First, it measuring through the use of individual assessments, and the second, real food intake can be used to evaluate hunger; that is, the compensate of diet consumed within a confirmed condition can be regarded a gauge of zest. It is possible for a variety of factors to intervene between folk desire to take and their actual food intake, including cognitive aspects like dietary constraint, but also external ones like availability, the hedonic characteristics of food, and social conditions (de Graaf et al., 2004).

The phrase " appetite loss " can be interpreted as a sign of together life fitness and grade of cancer, and it has been revealed to be joined with both survival and activity function. It is also linked with both survival and activity function. Preliminary evidence suggests that proinflammatory cytokines and neurohormonal changes are involved in the systemic pathophysiology of essential appetite loss in progress stages of cancer, and that this is related to the host's response to the tumour. Secondary factors such as sadness /psychosocial worry, dizziness ifficulty in emptying the bowels, taste abnormalities, or discomfort, among others, can effect on appetite loss (Shragge et al., 2006; Solheim et al., 2013).

Poor appetite is a substantial potential risk for nutritional risk, and when assessed in service setting with adult population with a good zest, it was found to be a

significant predictor of calorie and protein intake in the diet (Payette et al., 1995), whereas people who have a poor appetite or have a greater frequency of feeling hungry are classified as having a lack of appetite. In addition to having decreased energy consumption, these participants also had lower intakes of other nutrients (Shahar et al., 2003). another According to an Italian study, the most common reason for malnutrition in people with cancer was a lack of desire to eat (Muscaritoli et al., 2017).

Chewing problems are becoming increasingly widespread among the elderly. In most cases, this is due to poor oral hygiene or poorly fitting dentures, although it can also be produced by neurodegenerative illnesses such as Parkinson's disease. It could be a result of the absence of free or affordable teeth treatments, and it could have a negative influence on dietary status as a result. As a result, chewing difficulties in elderly persons may not only raise the risk of malnutrition, but they may also increase the chance of death. As suggested by the World Health Organization, multi form screening for adult persons in the region should include not only a physical examination, but also a physical examination and a physical examination of the eyes. People who do not have chewing challenges may be at lower peril of having their food intake lowered; however, this does not automatically imply that they will be can healthier in the long run (Woo et al., 2018). Chewing challenges have been linked to frailty in recent research according to the authors (Castrejón-Pérez et al., 2012; Kamdem et al., 2017). While malnourishment is frequently related with frailty in community surveys (Wei et al., 2017; Verlaan et al., 2017).

Nearly 8% of the folk's world (approximately 590 million individuals) is thought to be affected by dysphagia. For order to lessen the danger of suffocating and aspiration, texture-modified diets and thickened fluids are frequently employed. In order supply worldwide regulated nomenclature and standards for texture-modified meals and beverages that are available to clients with hard swallowing dysphagia during all life at all care settings, and across all civilization, as claimed by the International Dysphagia Diet Standardisation Initiative (Cichero et al., 2016).

Individuals suffering with dysphagia have a lower quality of life. Malnourished individuals with esophageal dysphagia, as well as those who do not have access to appropriate therapy and therapies, are more likely to require hospitalisation for a more extended amount of time, to experience problems, and to die than those who are well

nourished in this way, dysphagia and malnutrition are intimately connected (Ueshima et al., 2021). Blanař et al. (2019) discovered in their previous study to determine the relationship between malnutrition and dysphagic that 39.2% of the participating patients, 13.6% of them suffer from malnutrition, and this indicates a close association between malnutrition and dysphagia.

The ability to execute self-feeding tasks might fluctuate on a daily basis in residents with cognitive impairment, and these swings may go undetected for several days before the resident's weight changes. It has been discovered that residents' BMI decreasing less than 20-22 kg/m² is frequently the first critical symptom of malnutrition in long-term settings, and that this is the Minimum Data Set variable that is most predictive of malnutrition. (Posthauer et al., 2015; Crogan & Corbett, 2002). Several other variables from the Minimum Data Set have been identified as being oracular of decreasing proteins or calories malnourishment, including weight changes in the prior four weeks ago, discrepancy in physical functioning from dawn till dusk, a psychic diagnosis, antidepressant and diuretic use, destroyed or tooth loss, and residing lonely before admission to a long-term nursing facility (Crogan & Corbett, 2002).

Adult folks demand low energy than younger folks, owing to a decrease in basilar metabolic scores as a sequel of advance age, as well as a possible fall in grades of performance. It is dependent on a variety of parameters, comprising age, both gender, composition and weight of body, and level of exercise, to determine the amount of energy required. As we get older, our energy requirements tend to decrease due to the loss of muscular mass in our bodies and a fall in our activity levels. If an elderly person has quite low energy requests, there is peril that their food will not provide enough micronutrients (vitamins and minerals), which can lead to nutritional deficiencies. As a result, the quality of one's diet is extremely important in order to avoid nutritional deficiencies from developing (Jones et al., 2009).

2.4.4. Anthropometric Variables

Anthropometric indices are non-deep quantitative sizing of the human anatomy taken by a trained professional. They are typically accustomed in the infant and

children groups to appraise the general health situation, nutritional acceptability, as well as the growth issues of the child. Anthropometry is a precious appliance in assessing dietitian status in all ages, but it is particularly useful in assessing nutritional status in children. In order for clinicians to appraise a child's overall health and well-being, they must use growth metrics and typical growth patterns as the gold standard (Fryar et al., 2016).

Dietary anthropometry is comprised of the following components: MI, height and weight, head circumferences, calf and modest upper arm diameters to appraise adiposity (waist, hip, and limbs), and skinfold thickness. Proper sequential anthropometric measures in people can assist in the identification of underlying medical, nutritional, or social problems. anthropometric data that are abnormal, particularly in the pediatric population, should be investigated further. It belayed that anthropometric measurements may be appraise to inspect body composition in athletes, which can be used to mend their competitive accomplishment while also uncovering implied health issues such as habits of eating disorders. The use of it-driven fitness programmes in athletes has been found to mend functions of cardiorespiratory fitness as well as muscular strength and endurance (Casadei & Kiel, 2021).

Patient's with gastrointestinal cancers experience significant weight loss without intending to do so, which has a bereaved tenor on therapy, survival aftereffect, and fineness of life. In the absence of further research, it is impossible to portend the trajectory of weight lack or the association between basic BMI, site of malignancy, and results. (Yoon et al., 2019). Involuntary weight loss has a bereaved effect on physical performance. (Fearon et al., 2011),.

Adults with GIC have a poor QoL, bad treatment outcomes, and a short survival time. (Tisdale, 2002). When it comes to cancer patients, cachexia is a factor in up to 20% of deaths. (Tan & Fearon, 2008), An unintended weight lack of 5 percent or more of one's body weight in a six-month period, or more than 2 percent if the patient's BMI is less than 20 kg/m², is considered dangerous. (Fearon et al., 2011; Bozzetti & Mariani, 2008).

Lack of weight of more than 15 percent results in weaken body role, while lack of weight of more than 30 percent can upshot in akin death in tumor patients. (Tisdale,

2002). In addition to the consequences of chemotherapy, declining diet getting, dietary level lack, changes in energy expenditure, and lack of weight, primarily of BMI, are all connected with the treatment.(R. & Chacko, 2014; Kim et al., 2011).

According to a recent estimate of the literature, the linkage between the normal evolution of weight changes over time and BMI in cancer patients has not been thoroughly investigated. More studied is demanded on this crucial topic to clarifying the weight loss trajectory of cancer patients, particularly those with gastrointestinal malignancies, throughout cancer therapy in order to establish the most effective time to intervene (Greenlee et al., 2016).

According to many studies, unplanned weight loss and malnutrition in health can affect up to 85 percent of the occupant populations in facilities (Ahmed & Haboubi, 2010; Dorner et al., 2009). According to the findings in past study, considerable weight loss was related with a higher probability of getting an ulcer of pressure (Horn et al.,2004). The findings of Shahin et al. (2010) revealed that of 290 guest with pressure ulcers at health spaces in German (mean age 82.3 years) and hospitals (mean age 65.2 years), 14 percent had experienced an unexpected weight loss of 5–10 percent in 6 months or less, and 3.7 percent had experienced an unexpected weight lack risining about 10 percent.

Unexpected weight loss may also be caused by special diet orders, which are not always followed. An individual's restricted diet condition, by itself, will not serve as a "trigger" for service planning until it is escort by lack of weight or mouth intake of fluids and nutrients (leaves 25 percent or more on plate at end of meals) (Simmons et al., 2002).

Many studies have discovered evidence of malnourishment in older persons who have higher BMI values. BMI principles between 24 and 27 kg/m² are associated with decreased risk of fatalities and an amended health (Babiarczyk and Turbiarz, 2012; Kvamme et al., 2012). According to Ness-Abramof and Apovian (2008), older persons lose muscle mass as well as body height (Srikanthan et al., 2009), which can result in an underestimating of BMI. This reffers is a bad foreteller of health challenges linked with BMI in the adult folks.

Adults' body measures can be used to determine their health and dietary condition, as well as their peril of progress disease in the future. Also it benefits to estimate cons and prons of body in adults to aid in the diagnosis of obesity and the determination of underlying dietary case in children and adolescents (Gavriilidou et al., 2015).

Besides assessing variables of dietary condition in female who had pregnant and folks with obesity, anthropometric measurements are also utilized to screen patients with overweight (Ververs et al., 2013). Adults should have their anthropometric measurements taken at each well-visit to identify their dietary condition and the likelihood of developing futurity disease (Casadei & Kiel, 2021). BMI, formerly known as the Quetelet index, is a metric found to detect dietary case in humans.

A metric known as the BMI is currently in use to define the anthropometric height and weight features of clients and to classify them into different groups. The most widely accepted explanation is that it serves as a measure of an individual's fatness. It is also frequently cited as a perily element for the increase of or the incidence of a variety of medical or health cases, among other factors. Furthermore, it is often employed in the formulation of public health programs (Nuttall, 2015). With regard to adults over the youth age, BMI can be classified into one of the main groups: underweight BMI less than 18.5 kg/m^2 , normal weight BMI between $18.5\text{-}24.9 \text{ kg/m}^2$, overweight BMI between $25 \text{ and } 29.9 \text{ kg/m}^2$, obese BMI between $30 \text{ and } 39.9 \text{ kg/m}^2$ and morbidly obese BMI greater than 40 kg/m^2 (WHO, 2021).

Based on a previous literature review, a study demonstrated the association of anthropometrics with underlying health conditions, monitoring anthropometry correlation to potential cases such as myocardial issues , congestive heart failure, cerebrovascular disease, mental problems, and dementia, and It observed that people involved with myocardial disorders had clear link higher weight, BMI, and waist-to-hip ratio, suggesting a higher occurrence of subcutaneous and central adiponectin in their bodies. According to the findings of the study, having a high skinfold measurement is a strong predictor and/or predisposing peril element for congestive heart failure. Those suffering from cognitive impairment were found to be heavier, and

those suffering from dementia were found to be lighter as well as having smaller skinfold dimensions (Gavriilidou et al., 2015).

When it comes to identifying adult anthropometric height and weight features and separating them into groups, the BMI is the metric most commonly used today. The most widely accepted explanation is that it serves as a measure of a person's fatness. It is also frequently cited as a strong predictor of or the prevalence of a variety of health problems, among other things. Furthermore, it is often employed in the formulation of public health policy (Nuttall, 2015).

BMI is one of the most commonly serve components of nutrition screening tools due to the fact that it is a low-cost and simple measurement, With methods that give a scoring or grades of malnutrition risk based on falling BMI cut-offs, it is possible to take a rapid, straightforward, and pragmatic evaluation. In order to detect people at hazard, based on the characteristics of the target patient group, factors that leverage susceptibility of the instrument are taken into consideration. As a result, BMI is frequently used in malnutrition screening and evaluation methods to serve recognize those who are at peril of malnutrition (Ng et al., 2019).

Regardless of the fact that BMI has a positive significant correlation with malnutrition in aged hospitalized patients, BMI cut-off points utilized in ordinarily used nutrition assessment methods revealed low concurrent validity in that study. According to the optimal BMI cut-off point linked with malnourishment in this mostly overweight or obesity adult inpatient group, the optimal BMI cut-off point was 26 kg/m² (Ng et al., 2019).

Because it is correlated with body fat in older, the BMI is applied to determine obesity. While it does not directly observe body fat, it does have several limitations when used as a standalone measurement tool. The percentage of body fat varies depending on the individual's social profile. The percentage of body fat increases with age, even if the weight remains constant, making it a less accurate indicator of obesity in older folks than other measures. Another factor to consider in athletes is that increased muscle mass for a particular height and age will cause their BMI to rise, even if they have a very low percentage of total body fat (Casadei & Kiel, 2021).

The relationship between BMI and ephemerality was usually depicted as a U curve, with the minimum deaths in the society with accepted weight and the greatest dying rate in the group with significantly underweight and excessively overweight (Di Angelantonio et al., 2016).

The presence of a high BMI in the general public has been shown to be a passive hint factor in a variety of surgical approaches used in cancer treatment. Patients with cancer who have a BMI of less than 40 kg/m² have been shown to have death rates that are up to 50 percent -60 percent higher than those who are of normal weight. Recent research, however, has found that the impact of increasing Proportion on survival result differs depending on the type of cancer being studied. As an example, a high BMI is related with a bad prognosis in patients with GIC (Calle et al., 2003).

Patients with elevated BMI experienced more postoperative difficulties and spent more money after their surgery for GIC, according to previous research that recruited 30,765 patients who underwent gastrointestinal cancer operation procedures (Yasunaga et al., 2013). One more multi-institutional analysis conducted in America, which recruited 2,258 cases who had GIC operations, found that only being underweight, rather than having a high BMI, was not a predictor after operative dying or significant problems (Mullen et al., 2008).

The concept of "obesity paradox" in individuals with malignancy following radical operation has recently been validated by a raising account of research from Western countries, which indicates that patients with cancer who have a high BMI have a better outcome after surgery (Attaran et al., 2012).

When parallel to folks who are excessively obese, those who are exceedingly underweight who have cancer surgery have the worst survival outcomes. The underweight condition represented the underlying malnutrition condition (Mullen et al., 2008). According to a survey conducted in Iraq in 2015, almost two out of every three respondents were obese or overweight (Pengpid & Peltzer, 2021).

Adults and older folks can benefit from the use of the mid-upper arm circumference (MUAC), which is a less complicated anthropometric indices that applied to assess nutrition and health condition (Jamir et al., 2013; Schaap et al., 2018).

MUAC is measured the circumference at the midpoint between the olecranon and acromion processes. Because the arm contains both subcutaneous fat and muscle, alterations in MUAC can be a reflection of changes in either muscle mass or subcutaneous fat, or a combination of the two. Incidence's or variables in MUAC are often more probable to mirror variables in body mass in undernourished cases, who resort to have lesser quantities of subcutaneous fat than other persons. The assessment of MUAC in these patients can be applied as a sign of protein-energy malnourishment or hunger, especially when assessing weight or height is not possible (Gibson, 2005).

A huge number of investigations have established the MUAC is extremely correlated with BMI in older folks (Martin et al., 2009; Mazicioglu et al., 2010). Among the elderly staying in long-term care institutions, it is substantially connected with raising rates of morbidity and mortality, Adults staying in institutional care with CC and MUAC have minimum rates of reasons death than the general population. Individuals with higher MUAC and CC had decreased all-cause death than those with lower levels (Weng et al., 2018).

This older population residing in health service institutions has the best dietary predictor of mortality, and MUAC is that predictor (Allard et al., 2004). The use of MUAC as a nutritional assessment process in adolescents and adults has been recorded, In addition, if shown to be a validated and accurate dietary assessment method , it will be employed in the development of an appropriate MUAC cut-off, It is anticipated that the adoption of MUAC instead of BMI in populations and hospitals will shorting of time and technical skill necessary for nutrition test , leading to a greater quantum of persons who would pons from additional dietary assessment and management (Tang et al., 2020).

Individuals who are unable to sit or stand adequately can readily be assessed using the MUAC measuring technique. BMI measurements cannot be taken on bedridden or elderly participants since they are unable to stand up straight to take their height measurements. However, MUAC measurements can be taken on these individuals to determine their nutritional condition. The relationship between BMI and MUAC has been thoroughly established by a number of research conducted among a diverse range of ethnic backgrounds (Jamir et al., 2013; Bisai & Bose, 2009).

The MUAC has a strong relationship with BMI. A simpler alternative to the BMI cut-off of 18.5 for adult undernutrition may be explored for its simplicity and ease of recall: MUAC 25 cm for males and MUAC 24 cm for females (Sultana et al., 2015). As a result of its larger relationship with mortality in older people and the fact that it is easier to quantify in this population, the modified MUAC appears to be a more practicable anthropometric measure of thinness in adult for both gender than the BMI (Wijnhoven et al., 2010).

A prior study conducted among different ethnic groups in India employed a minimum upper arm circumference (MUAC) of 23 cm as a cutoff to define undernutrition among adult male and elderly population (Bose et al., 2006). In addition, a review achievement in Delhi, India, advocated a MUAC of 25.7 cm for community-based older males living in the city's urban sector (Goswami et al., 2018). Multiple research suggests that the MUAC in elderly people may serve as a proxy indication of nutritional status (Shatenstein et al., 2001b; Jamir et al., 2013).

When BMI cannot be estimated by weight or height, the MUAC can be benefit as a representative for determining nutritional status in instances when neither can be ascertained. Undernutrition can be detected by measuring the MUAC in males at 25.7 cm and women at 24.3 cm, whereas overweight/obesity can be detected by measuring the mid-upper arm circumference at 28.5 cm and women at 27.5 cm (Goswami et al., 2018).

CC is an anthropometric incidence that is strongly join to total body muscle mass and has been shown to be correlated with the nutritional condition of the older folks, among other findings (Tresignie et al., 2013). The presence of CC was found to be associated with lower appendicular skeletal muscle mass and lower skeletal muscle index in a Japanese study with 526 individuals. CC was also found to be connected with the diagnosis of sarcopenia (Kawakami et al., 2014).

CC is an important measure to consider since it not only has the strongest link with nutritional proteins when matched to the other incidences, but it is also extra liable than any of the other anthropometric indicators to variety. Men, in particular, benefit from the 30.5 cm limit because it has a high predictive value. It is a low-cost method that is both quick and easy to measure. The systematic assessment of this marker may

help to enhance the screening and diagnosis of protein energy malnutrition in the elderly, which is a widespread snag in this population (Bonnefoy et al., 2002).

When using the Mini Nutritional Assessment-Short Form tool(MNA-SF) to recognize malnutrition, the CC can be used in place of the BMI. allowing for its use in immobile folks or in situations where body weight cannot be assessed, such as in resource-limited environments (Kaiser et al., 2009). Lower body circumferences, according to a Korean study, are linked with metabolic syndrome and arterial stiffness, suggesting that they may be associated with decreased risks for heart disease (Kim & So, 2017).

The circumference of the calf also presents insight about the normal muscle mass in the leg. It can be consisting by a loss in muscle mass in case of lack of physical exercise. A measurement of extra 31 cm is regarded to be normal (Tsai et al., 2008). CC was found to be strongly linked with both appendicular musculoskeletal mass and skeletal muscle index, suggesting that it had able employed as a proxy diagnostic of muscle mass in the detecting of sarcopenia. The proposed cut-off ranges for CC for prophesy poor muscle mass in men are 34 cm and 33 cm, respectively, in men and female(Kawakami et al., 2014). The measurement of arm and calf circumferences in the identification of sarcopenia should be done with caution because of the possibility of mistakes in version due to the subsistence of edoema and the possibility of connective and adipose tissue in the position of muscle tissue (Strzelecki et al., 2011).

According to the findings of prior study, CC may be associated with a decreasing frailty index and better functional activity in older individuals who live in their communities. As a result, it is a very useful instrument for informing public health policy and make appointments. (Landi et al., 2014). Muscle-related impairment and physical function can be assessed using CC, which can provide crucial data (Rolland et al., 2003). An investigation into the relationship between CC and health consequences has been conducted in a number of research. Having a CC less than 31 cm is connected with higher frailty and poorer physical roles in adults (Landi et al., 2014; Rolland et al., 2003).

Waist circumference was shown to be linked with mortality in men, but arm, thigh, and CC were found to be connected with mortality in women. Arm and

thigh circumferences were found to be linked with mortality in both females and males (Mason et al., 2008). According to long-term studies, circumference of calf is inversely associated with death (Mason et al., 2008; Wijnhoven et al., 2010).

Body height is defined as the range between the base and the highest anatomic point of the head. The measurement is carried out in the start of day (due to fluctuations in the body height within a day) using a stadiometer or portable anthropometry with a precision of 0.1 cm. In order to be measured properly, the subject should be standing freely erect with their knees and heels together and their toes slightly apart from one another. In adults, the result of measurements of body height is a reasonably constant characteristic; nevertheless, as a result of involution processes, it may alter with age (e.g., osteoporosis). Differences of up to 10 centimeters are possible (Wronka et al., 2010).

2.9.Nurses Role In Preventing Malnutrition

Nurses have a vital role as access among clients and health-care serves. Throughout their life course, all patients come into contact with nurses. Nurses play an essential part and tasks in the supportive care of adult with tumor. In order to make a positive contribution to the refinement of nutritional support provided to these clients, nurses require sufficient training in order to be clarify to recognize malnutrition peril and provide a stages of therapies that are tailored to each folks needs. Disease condition, tumor site, treatment for cancer, comorbidity, physiological age, technique of facilitating food change, and family functioning are all factors to consider when designing interventions (Hopkinson, 2015).

When there are nutritional hazards in a patient's condition, nurses should provide nutritional care. These risks include: hunger or weight loss, low BMI, eating troubles, physical or mental health, and major gastrointestinal illnesses (Hopkinson, 2015).

Oncology nurses may be able to help cancer patients lower their dietary risk, through the provision of supportive dietary therapies not just to the patient, but also to the patient's caregiver. Increased awareness of potential hurdles and impediments to acquiring appropriate food and drink among family members is a critical function that

nurses could play. . Nurses should maybe provide counselling to family caregivers on food selection, patient placement, and appropriate assistance with feeding. Information and counselling, as well as incorporating family caregivers in the patient's nutritional care, are some of the nurse-delivered interventions that have been found to be beneficial (Hopkinson, 2015).

The provision of oral nutritional supplements, fluid/food fortification, and provision of nutritional advice and education to older persons can be done safely by nurses since they are well-positioned to oversee the critical processes of nutritional care for older adults (Cate et al., 2020).

2.10. Malnutrition Among Iraqi Patients

Al-Kazrajy & Hammadi (2020) Cross-sectional study were carried out among a convenient sample of 250 adult people who attended health care setting in Baghdad from 15th of March until end of July 2018, aimed at assessing the nutritional status of adults using MNA scoring forms, showed the social characteristics that were associated with malnutrition status were low level of education, unmarried, not working as well as low economic status. This study also discovered that 49.8 percent of the old with chronic conditions were malnutrition, but that this analytically not have a statistically clear link effect on dietary patterns. The amount of drug used, as well as the frequency of consumption consumed in a day, have all been found to have a statistically significant relationship with nutritional health. Adult people who are depressed and have memory impairment had the elevation rates bad nutrition and being at peril of malnutrition, as stated by results of that study.

According to BMI, there is a low prevalence of undernutrition and malnutrition among surgical inpatients. When it comes to patients in long-term surgical treatment, as well as those who are influenced by morbidities, obesity and excess weight are the most common concerns, these results had been shown by relying on a previous regional literature review that was conducted by Al-Bassam (2018) between December 2012 and April 2013 in Basrah, which is located in the southern region of Iraq, The intention of that cross sectional survey was to inquire into and assess the nutritional status of 214 adult surgical inpatients, as well as to determine the

relationship between the risk of malnutrition, hospital stay duration, care outcomes, any cohabitation between malnourishment and fatness with surgical patients.

Patients with diabetes who were above the age of 65 were more vulnerable to malnutrition than patients with non-diabetes. Malnutrition was found to be nearly twice as common in uncontrolled diabetics as it was in diabetics who were under control. Malnutrition was found to be much more prevalent with increasing age, as well as with increasing diabetes duration and manner of diabetic treatment, according to a previous case-control study, which was conducted between April 2015 and April 2016, the goal of it was to release the incidence of malnourishment in older diabetic people as well as the variables that were linked with malnutrition. comprised a sample of 200 cases diagnosed in Erbil, Iraq, which is located in the country's northern region (Ayub& Ismail,2019).

One a descriptive cross-sectional study by Alkhalidi & Alshemerty (2018) conducted in 2016 on persons over the age of 18 who attended the clinic in 2014 in Al-Qadisiyah Governorate, Iraq and the goal of the study was to estimate BMI status and demographic factors that were linked with overweight and obesity in the participants, shown a change in the beliefs, culture, and lifestyle of Iraqi women may be associated with overweight and obesity, as well as married folks and folks with a minimum educational level in the Iraqi region.

The majority of illiterate patients in unit hospitals, such as hemodialysis patients, bear from mild malnourishment, as stated by too many point of reference, including incidence's data, lab results, and the quantity and fineness of food consumed (Al-ashour, & Mohammed,2019).

2.11. Impact Of GIT Cancer On Nutritional Status

GI malignancies account for roughly 30% of cancer case and 32% of cancer deaths intercontinental, with death rates increasing exponentially with age in both developed and developing nations (Ferlay, J., 2010). Sarcopenia is a condition associated with the aging process, which is characterized by a gradual and progressive

lack of skeletal muscle mass, resulting in decreased or affect physical roles (Cruz-Jentoft et al., 2010). It is commonly observed in older adults who are sedentary. Sarcopenia is estimated to be present in 30% of adults over the age of 60, and a descend in muscle mass is suggested to occur at rate of reach up to 15% in each decade by the time an individual reaches the age of 70. As a result, it increases the likelihood of developing negative outcomes such as dysfunction, lack quality of life, and demise, its impact may be exacerbated in the malignancy presence. Studies showed that regular exercises resistance and aerobic, combined to intake sufficient of protein and energy, can help to mitigate the complexity of age-related fall in mass of muscle, strength, and roles among being well- healthy elderly people. Sarcopenia is correlated with poorer outcomes in cancer conditions, including an increased risk of advancing 5-FU and capecitabine-linked to grade 2 toxicities, which are the central component of treatment for most GIC. There is also a 2-fold increase in fate rate in patients with CRC who have more than 5% muscle loss after chemotherapy (Mislant et al., 2018).

Sarcopenia is described as the lack of muscle size and strength that happens as a result of the natural aging process. As a result, it is closely associated with the term "flail," and it might be considered a risk factor for fractures and aspiration pneumonia. Sarcopenia is classified as either primary or secondary, depending on the underlying cause. Unlike primary sarcopenia, which is produced by the natural progression of age, secondary sarcopenia is caused by disuse, starvation, organ failure, invasive procedures, cancer, or other disorders (Kuwada et al., 2019).

Fatigue and weakness are common symptoms in individuals with advanced cancer, as are weight loss and decreased appetite. Chronic sickness and early satiety are also possible side effects. This collection of symptoms is referred to as the cancer symptom cluster. Anorexia-cachexia syndrome is a type of eating disorder (Stojcev et al., 2013).

Reduced intake main food, lack of weight, hypoalbuminemia, and wasting of muscle tissue characterize the anorexia-cachexia syndrome, which is typically observed in cancer patients in the late stages of disease. It is accompanying with largest risk of morbidity and mortality (Fearon et al., 2011).

In clients with GIC, this disease is mostly caused by a blockage of the upper gastrointestinal tract as a result of the mechanical impacts of the tumor on the surrounding tissues. Dysphagia, early satiety, nausea, and vomiting are all possible side effects (Donohoe, Ryan, & Reynolds, 2011). The anorexia-cachexia condition is related to a shorter overall prognosis for GIC. This syndrome, when combined with other symptoms like queasiness, spew or puke, early satiety, and dysphagia post procedures of chemo-radiotherapy, or surgery, may lead to cancer-related malnutrition (Rosania et al., 2016).

It is also recognized as a cancer-accompanied wasting syndrome or cancer cachexia-anorexia syndrome. It is a several issues syndrome characterized by outstanding wastage of skeletal muscle mass with or absence loss of fat mass that is not just reversible with conventional nutritional supply, resulting in cumulative functional impairment (Fearon et al., 2011). When observed in patients with cancer, it can also serve as a sign of tumor progression (Porporato, 2016).

Because of the high prevalence of cachexia, which affects around 50–80% of individuals' accompanied with cancer contingent on the cancer type, the condition has recently received more attention in the medical community. Furthermore, it is suspected to be the primary cause of roughly 20% of cancer-related demise (Argilés, Busquets, Stemmler, & López-Soriano, 2014).

It is typical for cachexia to be linked with inadequate food intake, which results in an overall condition of decline and coping, reduced or missed skeletal activity, and modulation or variation metabolism as a result of a pathologic systemic inflammatory response (Aapro et al., 2014). Although this syndrome can appear even in the without visible lack of weight and before a significant reduction in body fat mass, it is often overlooked because of obesity, leading to under-diagnosis and increased mortality (Mislang et al., 2018).

Patient's physical functioning, QoL, treatment results, and survival are all negatively affected by unintentional weight loss in patients with GIC (Fearon et al., 2011). Cachexia is responsible for up to 20% of cancer patient fatalities. Cachexia is illustrated as accidental weight loss of 5% or more of the body in 6 months, or greater than 2% if the patient's BMI is less than 20 kg/m², in the loss of a medical reason.

Weight loss of more than 15% results in reduced physiological function, while weight loss of more than 30% can result in impending death in cancer patients (Yoon et al., 2019).

2.12. Evaluation Of Nutritional Status

The nutritional state of a person has traditionally been assessed through the use of objective indicators such as laboratory and anthropometric measurements (e.g., circumference of muscle in arm, weight change, tricipital skin fold intensity, ranges of serum albumin or transferrin and nutrient balance). Certain target measures, such as rates of serum albumin, are potential to be affected to variety of non-food issues, such as stress, hydration status and disease process may be disguise the impact of genuine nutrient shortage, evaluating these metrics can be difficult (Table 1) (Zhang et al., 2014; Avelino-Silva, & Jaluul, 2017).

To assess malnutrition in older adults, the Mini nutritional assessment long-form(MNA-LF) instrument had been thoroughly tested and proven be effectivity. When compared to a clinical evaluation by two nutrition specialists, the instrument was found to be 92% accurate, and when parallel to a universal nutritional assessment, which included tests of biochemical, body indices, and dietary assessments, the instrument was discovered to be 98% accurate (Agarwalla, Saikia, & Baruah, 2015).

The dietary condition of sick clients was determined by the use of MNA® LF technology. Comparing the MNA to some nutritional assessment measures, such as biochemical values, anthropometric values, and dietary intakes, it has high sensitivity and specificity. The MNA-LF is an adult-related assessment instrument that includes questions about health and nutritional conditions, personal control or autonomy, QoL, cognition changes, situation of mobility, and personal health factors in older adults and people with disabilities. When used in a research setting, the complete MNA is a fantastic tool. Individuals' who are recognized as malnourishment or at malnutrition risk may benefit from this procedure since it can provide further information about the causes of malnutrition. In total, there are 18 questions in the full MNA, these are organized into four primary brands: nutritional evaluation; subjective evaluation; universal evaluation; and data about anthropometric. It is possible to receive up to 30 points from the full MNA, and it divides the status into three categories: malnourished

(MNA score less than 17 points), at risk of malnutrition (MNA score between 17–23.5), and well-nourished (MNA $\geq$ 24 points) (Hailemariam et al., 2016).

Table 2.1: Components of a typical nutrition assessment (Avelino-Silva, & Jaluul, 2017):

Assessment constituents	main characteristics	explanations
History of conditions	Food insecurity, past-oral intake, sensual deficiencies, animated abnormalities, swallowing and/or chewing issues, economic problems, inadequate social relationship support, and lack of achieve to food are all factors that might contribute to weight loss.	The majority of critical information can be acquired from a person's medical or health history.
Physical roles or functions examination	BMI, lack of subcutaneous fat, lack of muscle mass	Span of the arm, the thickness of skinfold, and circumference of the arm are all parameters (Use is restricted by the dependability of the examiner)
Laboratory tests	Prealbumin, transferrin, albumin	Albumin and transferrin, among other biomarkers, may not be dependable; prealbumin, on the other hand, maybe beneficial after inflammatory conditions have been treated.
Calorie requirements	Measuring the amount of energy used	It is difficult to obtain accurate measurements; There is no agreement on which predictive equation is the most effective.
Nutrition intervention is indicated with the following criteria	Underweight, recent weight loss or acute illness can lead to a lack of snack intake for one or two weeks if there is no pre-existing malnutrition; three to seven days if there is no preexisting malnutrition.	Patients with special needs include perioperative patients, those with GIC, and people with persistent post-stroke dysphasia.

BMI is a mathematical equation that calculates the rate of body weight to height. It is calculated by dividing the body weight in kilograms then the square of the height in meters squared (kg/m²). The BMI has a strong relationship with obesity, and

it also has a strong relationship with excess weight in the general population. It is crucial to highlight that the BMI value obtained can often be erroneous because it does not define total body adiposity, does not distinguish between fat and muscle, and does not forecast the distribution of body fat. It is classified as follows: underweight, healthy weight, overweight, and obese (Güngör, 2014; Harris, 2017).

Dietary assessment relies heavily on body weight as one of the most essential variables. It is a significant variable in equations predicting macronutrient and fluid requirements, as well as a useful index for the diagnosis of acute malnutrition. Weight, on the other hand, does not differentiate between fat, protein, bone, and water. The presence or absence of fluid, organomegaly, and tumor growth can all have an impact (Andreolia et al., 2016).

Individual identification was made easier with the introduction of stature, or bodily height, as an anthropometric characteristic. An important topic in physical anthropology and forensic science, the estimation of stature from fragmentary or deteriorating bodies comes up time and again (Pal et al., 2014).

The mid-upper arm circumference (MUAC) is considered a helpful screening measure in intervention strategies, as well as a better predictor of death than the upper arm circumference. The variances between MUAC and W/H, on the other hand, include differences in age, gender, and body form. Weighing for height and MUAC scores were demonstrated to distinguish between distinct groups suffering from severe acute malnutrition, with only a tiny amount of overlap between the two measures (Dukhia et al., 2017).

Calf circumference (CC) is a regularly utilized measurement since a decrease in CC is associated with muscle mass loss and malnutrition (Kurosawa et al., 2019).

2.13. Management of malnutrition

Preventions strategies and curing or management malnutrition in adult individuals is a critical element of adult client care, and it is one of the most difficult tasks. The development of nutritional treatment plans, which should include monitoring procedures and termination standards, should begin early in the

hospitalization process, taking into consideration the fact for even people with wellbeing nutrition can soon get malnourished while hospitalized. Dietary or nutrition care schedule should be developed through interdisciplinary collaboration and should include both the patient and their family/caregivers (Avelino-Silva, & Jaluul, 2017).

To effectively manage malnutrition, the following intervention measures are recommended (Volkert et al., 2019) (Table 2).

Table 2.2: Nutritional intervention options for the prevention and treatment of malnutrition (Volkert et al., 2019).

Basic advices	• Regime malnutrition check up using a validated test (GPP), followed by evaluation, customized intervention, observation, and modification of care procedures (GPP) • Personalized and universal nutritional treatment is provided (A) • A several modal and several academic and professional disciplinary team intervention including nutritional measures is recommended (B) • Identification and eradication of possible malnutrition-causing factors (GPP) • Avoiding dietary limitations wherever possible (GPP)
Supportive care intervention	• Pleasant dining setting in establishments (A) • If you have an eating dependency, you may need mealtime help (A in foundations, GPP in the house-care) • Participating in meal times with friends (GPP) • Meals on wheels that are high in energy and provide additional meals (B) • Education and information on nutrition are provided. (B) • Food is readily available. *
Nutritional counseling	• Individualized care for older people and caregivers (B) • In multiple sessions by a qualified individual (GPP)
Food modification	• Fortress of foods (B) • Extra meals / snacks * (include finger foods) (GPP) • Foods that have had their texture changed or that have been enriched (GPP)

	• Improvement in organoleptic properties (aroma, sense, and apparent aspect) * • Adding the diversity of foods consumed * • Taking into account individual preferences
Oral nutritional supplements (3 A, 3 GPP)	
Parenteral /Enteral nutrition (12 GPP)	
Recommendation grades: A= depend on good guide (At the very least, one of superior quality), B= related to higher case-control or cohort studies; based on evidence of moderate quality; GPP=good practice point/ a general agreement among experts: Based on the clinical expertise of the guideline development committee, recommended best practice has been developed.* a subject that has not been addressed in the ESPEN Guideline 2019	



3. MATERIAL AND METHODS

3.1. Design Of Study

A descriptive cross-sectional study styling was carried out in Baghdad, Iraq in the period from 2021-2022.

3.2. Study Setting

This study was conducted in Al-Amal National Hospital, Oncology Hospital, Gastroenterology, and Hepatology Teaching Hospital in Baghdad city in 2021-2022. AL-Amal National hospital for cancer management (previously known as Baghdad nuclear medicine and radiation hospital) is a tertiary health-care institution in Baghdad, Iraq, that was founded in February 1969 as the region's first dedicated oncology hospital. It is located in Baghdad, Iraq, and it offers diagnosis, treatment, and surveillance oncology services to patients suffering from cancer.

For the past 50 years, it has provided oncology treatments to millions of Iraqis and Arabs who came to this historic hospital in the end 980s and timely1990s for treatment of cancer. A total of 160 operating rooms, 50 chemotherapy chairs for outpatient and inpatient chemotherapy services, and 14 palliative care panels are available at the hospital, which provides all of the necessary health services to successfully complete cancer performance management, from diagnosing the cancer patient to completing the required imaging and exams to initiating the therapeutic process.

3.3. Study Sample

The sample was chosen by using nonprobability sampling (convenience sample). The researcher approached adults aged 50-65 and seniors aged 65-70 years who were patients diagnosed by physicians with gastrointestinal cancer in the third stage. The research and objective was explained to them and data collection began. The study sample comprised 140 patients with GIT cancer. G power package program was be used for power analysis. due to the fact that power analysis, the sampling power at the 0.05 significance level was 0.95.

G power package program was used in power analysis. As a result of the power analysis, it was found that the sampling power at the 0.05 significance level was 0.95.

Exact - Correlation: Bivariate normal model
Options: exact distribution
Analysis: Post hoc: Compute achieved power
Input: Tail(s) = One
Correlation ρ H1 = 0.2729012
 α err prob = 0.05
Total sample size = 140
Correlation ρ H0 = 0
Output: Lower critical r = 0.1395855
Upper critical r = 0.1395855
Power (1- β err prob) = 0.9500000

3.3.1 Inclusion Criteria for the Sample

- Patients diagnosed with GIT cancer in the third stage and receiving chemotherapy, radiotherapy, or surgical therapy in the hospitals included.
- Both genders.
- Agreed to cooperate in the study.

3.3.2 Criteria For The Study's Exclusions

- A medical diagnosis of cognitive and mental impairment
- Age younger than 50 years.
- Refusal to participate.

3.4. Study Instrument and Data Collection

The study tool was a questionnaire used to identify the nutritional status of adults aged 50-65 and seniors aged 65-70 who have GIT cancer. The instrument includes:

1. **Patient information form:** The 1st part consist of the health and sociodemographic characteristics for participations includes questions about age, gender, education level, residency, status of social, economic status, smoking, drinking alcohol, diagnosis of illness, family history of cancer, type of treatment, and complaints about previous health problems.
2. **MNA-LF:** It was developed in 1994 in collaboration between the Toulouse University, the New Mexico School of Medicine and the Swiss Nestle Research Center (Vellas et al.,20006). The MNA was originally approved in three studies including a total of 600 older participants, and was published by Guigoz et al. in 1994.

MNA is commonly used for screening of malnutrition in cancer patients at all ages (Torbahn, Strauß, Sieber, Volkert, & Kiesswetter, 2018). The MNA was tested in accordance with two important requirements. First and foremost, there is the “medical nutritional status. “decision made by two independently trained clinicians, without knowing the MNA results, after evaluating the nutritional status of patients including their clinical record (including comprehensive nutritional assessment). The second is a comprehensive nutritional assessment. Comprehensive nutritional assessment includes detailed anthropometric assessment (height, weight, knee length, mid-arm and calf circumferences, triceps and subscapular subcutaneous thickness); Indicators based on biochemical data (levels of albumin or pre-albumin, creatinine, transferrin, ceruloplasmin, C-reactive protein, alpha-1-acid glycoprotein, values of lipid profile and triglycerides, several types of vitamins including B and others, copper, folate, zinc, rate of hemoglobin, values of blood counts and differentials); and dietary consumption (3-day dietary record collective with food consumption repeated questions). Topics were classified using principal components and discriminant analysis. Exact cut-off rates were determined according cross-tabulation with albumin cut-off values in the absence of inflammation. The long-form MNA consists of 18 components that are organized into four divisions, These four portions are as follows: anthropometric assessment (BMI, weight, arm and calf circumferences); overall assessment (lifestyle, medication, physical functions or mobility, mental impairment symptoms); simple nutritional assessment (numeral of meals, snacks and fluid intake, autonomy in nutrition); and simple self-assessment (self-perception about health and nutrition habitus). The test is a quick method that is completed in about 10-15 minutes.

MNA classifies elderly patients as normally fed (≥ 24), at risk (between 17-23.5), or markedly malnourished (<17). According to the clinical condition, the sensitivity, specificity, and positive predictive values of the test are 96 percent, 98 percent, and 97 percent, respectively, of the total population. (Guigoz, 2006; Guigoz et al., 1994).

The Arabic version of the MNA was obtained from the Nestle nutrition institute (“Nestlé Nutrition Institute - MNA® Elderly - Nestlé Websites,” n.d.) Some questions are asked related to food reductions over the three months ago, lack of

weight, suffering from psychological stress, neuropsychological problems, having the ability to live independently, the use of pharmaceutical medications, sores because to pressure, the amount of full meals consumed on a daily basis, consumption indicators for protein intake (proportional to the amount of milk consumed (milk, cheese, yogurt) during day, portions of beans or eggs consumed each week, & meat, fish, or poultry every day), daily consumption of at least two servings of fruit or vegetables, The amount of fluid consumed (water, juice, coffee, tea, milk...), the style of feeding, and the individual's perception of his or her nutritional state, as well as mobility (Rubenstein et al., 2001; Vellas et al., 2006; Guigoz, 2006). The scale score indicator is:

- (24-30) for normal nutritional status.
- (17-23.5) for at risk of malnutrition.
- (less than 17) for malnourished.

The Arabic version of the MNA was obtained from the Nestle nutrition institute and there are many Iraqi studies which use the Arabic version of the MNA (Al-Kazrajy, & Hammadi, 2020; Ibrahim et al., 2019).

3. Anthropometric measurement:

- **Mid-upper arm circumference (MUAC);** The arm was bowed and the mark between olecranon and acromion handle was checked. When the arm was pendent straight down the tape was covered around the mid-point mark and MUAC was taken.
- **Body Mass Index (BMI):** It was computed by dividing the current body weight in kilos by the square of the person's height in meters.
- **Calf circumference (CC):** taken at the most extensive midpoint of the calf.
- **Weight measurement:** Seca scales were used to measure the weight of the study participants. Before the actual weighing of the participant, the scales were tested using standard weights to ensure that they were accurate. The scales were set up on a hard, flat surface, and participants were asked to weigh themselves while wearing just light clothing (excluding jackets, shoes, and belts). Each person in the study was measured twice, and the average of the two measurements was taken and calculated. Participants were relocated and weighed a third time if there was a significant

discrepancy between the two measurements that exceeded the tolerance limit, which is defined as the degree to which the two measurements are close together.

- **Height measurement:** Height for participants was taken with the standing with their back against the measuring board, shoulders heels, buttocks, heels, and head contacting a flat upright sliding headpiece. The legs participants were placed together making the knees and ankles touch each other. Measurement of Height was taken at maximum revelation and the height was recorded to the nearest 0.1 cm.

3.5. Statistical Analysis

When evaluating the data, IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. released 2013, program was used. For the analysis of descriptive data, mean $\pm$ standard deviation and frequency are given. The conformity of the variables to normal distribution was examined using visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk tests). For the evaluation of categorical variables, the "Pearson Chi-square Test" was used when the assumptions were met, and the "Exact Chi-square Test" was used when the number of samples in the crosstab was insufficient and the assumption could not be met. Statistical significance between quantitative variables and correlation coefficient was calculated with the "Two-Way Spearman Correlation Analysis". Significance level was taken as $p < .05$

3.6. Ethics Committee Approval

To facilitate the task of obtaining information from participants, ethical approval was obtained from Çankırı Karatekin University Scientific Research Evaluation Ethical Committee (No:21, Date:25.08.2021). The research was also approved by the Iraq Ministry of Health by an administrative order directed to medical city/Baghdad (Al-Amal National Hospital, Oncology Hospital, Gastroenterology and

Hepatology Teaching Hospital). The researcher explained the study and the objectives to the sample, then asked them to provide their verbal agreement to participate in the study and after this began to gather the data.



4. RESULTS

Table (4.1) shows that 27.9% of patients were aged 66-70 years, 60% were male, 35% were illiterate, 35% were suburban residents, 75.7% were married, 43.6% had barely adequate monthly income, 79.3% did not smoke, 85.7% did not drink, 31.4% had gastric cancer, 57.9% had no family history of cancer, 29.3% received combination therapy, and 52.1% complained of previous health problems.

Table 4.1: Distribution of sociodemographic characteristics of the sample (n=140)

Variables		No.	%
Age	50-55	31	22.1
	56-60	35	25
	61-65	35	25
	66-70	39	27.9
Gender	Female	56	40
	Male	84	60
Education	Illiterate	49	35
	Literate	28	20
	Elementary	18	12.9
	Middle School	19	13.6
	College	11	7.8
	University	10	7.1
	Postgraduate	5	3.6
Resident	Rural	45	32.1
	Suburban	49	35
	Urban	46	32.9
Social status	Divorced	11	7.8
	Married	106	75.7
	Single	6	4.3
	Widowed	17	12.2
Economic status	Adequate	50	30.7
	Barely adequate	61	43.6
	Inadequate	29	20.7
Smoking	No	111	79.3
	Yes	29	20.7
Drinking	No	120	85.7
	Yes	20	14.3
Diagnosis of illness	Cholangiocarcinoma	10	7.1
	Colorectal cancer	15	10.7
	Duodenal cancer	21	15
	Esophageal cancer	10	7.1
	Gastric cancer	44	31.4
	Liver cancer	20	14.3
	Pancreatic cancer	20	14.3
Family history of cancer	No	81	57.9
	Yes	59	42.1
Type of treatment	Chemotherapy	32	22.8

	Combination therapy	41	29.3
	Radiotherapy	27	19.3
	Surgical	40	28.6
Complaint of previous health problems	No	67	47.9
	yes	73	52.1

The results show that 69 (49.3%) patients were at risk of malnutrition, 42 (30%) patients have normal nutritional status, and 29 (20.7%) patients were malnourished. For measurements, 46.4% had mid-upper arm circumference 21-22 cm, 81.4% had calf circumference of 31 cm and more, 76.4% were mobile outside the house and 11.4% of the patients had a BMI less than 19 (Table 4.2).

Table 4.2: Distribution of MNA score and Anthropometric measurements among patients with cancer.

Measurements	Number	Percent
BMI results		
BMI < 19	16	11.4
BMI 19 to < 21	32	22.9
BMI 21 to < 23	47	33.6
BMI 23 or more	45	32.1
MUAC values in cm		
MUAC less than 21	12	8.6
MUAC 21 to 22	65	46.4
MUAC greater than 22	63	45.0
CC values in cm		
Less than 31	26	18.6
31 or great	114	81.4
MNA categories		
Normal nutritional status (24-30)	42	30.0
At risk of malnutrition (17-23.5)	69	49.3
Malnourished (less than 17)	29	20.7

Table 4.3: Causes of malnutrition in patients with cancer

Variables	Frequency	Percent
1- Food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties		
Severe decrease in food intake	25	17.9
Moderate decrease in food intake	49	35.0
No decrease in food intake	66	47.1
2- Weight loss during the last 3 months		
Weight loss greater than 3 kg	17	12.1
Does not know	33	23.6
Weight loss between 1 and 3 kg	54	38.6
No weight loss	36	25.7
3- Suffered psychological stress or acute disease in the past 3 months		
Yes	41	29.3
No	99	70.7
4- Neuropsychological problems		
Severe dementia or depression	13	9.3
Mild dementia	47	33.6
No psychological problems	80	57.1
5- Lives independently (not in a nursing home or hospital)		
No	20	14.3
Yes	120	85.7
6- Takes more than three prescription drugs per day		
Yes	55	39.3
No	85	60.7
7- Pressure sores or skin ulcers		
Yes	20	14.3
No	120	85.7
8- Number of full meals eaten every day		
One meal	20	14.3
Two meals	50	35.7
Three meals	70	50.0
9- Selected consumption markers for protein intake:		
A- At least one serving of dairy products (milk, cheese, yogurt) per day		
No	32	22.9
Yes	108	77.1

B- Two or more servings of legumes or eggs per week		
NO	23	16.4
YES	117	83.6
C- Meat, fish, or poultry every day		
NO	63	45.0
YES	77	55.0
10- Consumes two or more servings of fruit or vegetables per day		
No	61	43.6
Yes	79	56.4
11- Amount of fluid (water, juice, coffee, tea, milk...)		
Less than 3 cups	7	5.0
3 to 5 cups	70	50.0
More than 5 cups	63	45.0
12- Mode of feeding		
Unable to eat without assistance	14	10.0
Self-fed with some difficulty	52	37.1
Self-fed without any problem	74	52.9
13- Self-view of nutritional status		
Views self as being malnourished	22	15.7
Is uncertain of nutritional state	56	40.0
self as having no nutritional problem	62	44.3
14- Compared with other people of the same age, the patient considers their health status		
Not as good	16	11.4
Does not know	34	24.3
As good	41	29.3
Better	49	35.0
15- Ability to move (mobility)		
Bed- or chair-bound	5	3.6
Able to get out of bed/chair but does not	28	20.0
Goes out	107	76.4

The findings in table (4.3) revealed that 47.1% of patients had no decrease in food intake and others had moderate to severe decrease in food intake. Of patients, 38.6 had lost 1-3 kg and 17.9% lost more than 3 kg during the last three months. Among patients, 70.7% had not suffered from psychological stress, 57.1% did not have psychological problems and others had moderate to severe dementia. Of the patients, 33.6% had body mass index of 21-23, 85.7% lived independently, 60.7% do not take more than 3 drugs per day, and 85.7% had no skin ulcers. In terms of eating, 50% ate three meals every day and the other half ate 1-2 meals per day. Among patients, 77.1%

ate at least one item of dairy products (milk, cheese, or yoghurt) per day, 83.6% ate more than 2 servings of legumes or eggs per week, 55% ate meat, fish, or poultry every day, 56.4% consumed two or more servings of fruit or vegetables per day, 50% drank 3-5 cups of fluid and 45% drank more than 5 cups. For feeding, 52.9% self-fed without any problem and the other patients had difficulty. Of the patients, 44.3% had no nutritional problems and 29.3% and 35% had good to better health status .

Table 4.4: Correlations between MNA score and socio-demographic characteristics

Variables			No. (140)	Malnourished (n=29)	At risk (n=69)	Normal (n=42)	P-value	Test value
Age	50-55	n	31	4	13	14	0.304	7.186
		%	22.1	2.9	9.3	10.0		
	56-60	n	35	7	18	10		
		%	25	5.0	12.9	7.1		
	61-65	n	35	6	19	10		
		%	25	4.3	13.6	7.1		
	66-70	n	39	12	19	8		
		%	27.9	8.6	13.6	5.7		
Gender	Female	n	56	10	32	14	0.314	2.315
		%	40	7.1	22.9	10.0		
	Male	n	84	19	37	28		
		%	60	13.6	26.4	20.0		
Education	Illiterate	n	49	8	28	13	0.556	10.690
		%	35	5.7	20.0	9.3		
	Literate	n	28	4	13	11		
		%	20	2.9	9.3	7.9		
	Elementary	n	18	5	9	4		
		%	12.9	3.6	6.4	2.9		
	Secondary	n	19	3	11	5		
		%	13.6	2.1	7.9	3.6		
	Associate	n	11	4	4	3		
		%	7.9	2.9	2.9	2.1		
	Graduate	n	10	4	3	3		
		%	7.1	2.9	2.1	2.1		
	Post-graduate	n	5	1	1	3		
		%	3.6	0.7	0.7	2.1		
Resident	Rural	n	45	7	25	13	0.503	3.339
		%	32.1	5.0	17.9	9.3		
	Suburban	n	49	13	24	12		
		%	35	9.3	17.1	8.6		
	Urban	n	46	9	20	17		
		%	32.9	6.4	14.3	12.1		
Social status	Divorced	n	11	3	7	1	0.005*	18.555
		%	7.9	2.1	5.0	0.7		
	Married	n	106	15	53	38		
		%	75.7	10.7	37.9	27.1		

	Single	n	6	2	2	2		
		%	4.3	1.4	1.4	1.4		
	Widowed	n	17	9	7	1		
		%	12.1	6.4	5.0	0.7		
Economic status	Sufficient	n	50	9	28	13	0.016*	12.213
		%	35.7	6.4	20.0	9.3		
	Hardly	n	61	16	32	13		
		%	43.6	11.4	22.9	9.3		
	Insufficient	n	29	4	9	16		
		%	20.7	2.9	6.4	11.4		
Smoking	No	n	111	24	55	32	0.792	0.466
		%	79.3	17.1	39.3	22.9		
	Yes	n	29	5	14	10		
		%	20.7	3.6	10.0	7.1		
Drinking	No	n	120	25	61	34	0.551	1.192
		%	85.7	17.9	43.6	24.3		
	Yes	n	20	4	8	8		
		%	14.3	2.9	5.7	5.7		
Diagnosis of illness	Colorectal cancer	n	10	2	4	4	0.787	7.980
		%	7.1	1.4	2.9	2.9		
	Colorectal cancer	n	15	4	8	3		
		%	10.7	2.9	5.7	2.1		
	Duodenal cancer	n	21	3	12	6		
		%	15.0	2.1	8.6	4.3		
	Esophageal cancer	n	10	1	6	3		
		%	7.1	0.7	4.3	2.1		
	Gastric cancer	n	44	7	20	17		
		%	31.4	5.0	14.3	12.1		
	Liver cancer	n	20	5	11	4		
		%	14.3	3.6	7.9	2.9		
	Pancreatic cancer	n	20	7	8	5		
		%	14.3	5.0	5.7	3.6		
Family history of cancer	Yes	n	81	23	35	23	0.029*	7.079
		%	57.9	16.4	25.0	16.4		
	No	n	59	6	34	19		
		%	42.1	4.3	24.3	13.6		
Type of treatment	Chemotherapy	n	32	10	14	8	0.387	6.334
		%	22.9	7.1	10.0	5.7		
	Combination therapy	n	41	8	19	14		
		%	29.3	5.7	13.6	10.0		
	Radiotherapy	n	27	6	16	5		
		%	19.3	4.3	11.4	3.6		
	Surgical	n	40	5	20	15		
		%	28.6	3.6	14.3	10.7		
Complaints of previous health problems	No	n	67	12	37	18	0.401	1.828
		%	47.9	8.6	26.4	12.9		
	yes	n	73	17	32	24		
		%	52.1	12.1	22.9	17.1		

The findings indicated that there were significant statistical relationships between the MNA of patients with social status at p-value 0.005, economic status at p-value 0.016, and family history of cancer at p-value 0.029. Also, there were no significant statistical correlations between the MNA of patients with age, gender, education, resident, smoking, drinking, diagnosis of illness, type of treatment, and complaint of previous health problems (Table 4.4).

Table 4.5. Correlations between MNA, weight, BMI, MUAC and calf circumference

Spearman's rho		MNA	Weight	BMI	MUAC	Calf circumference
MNA	r	1	.345*	.393*	.290*	.271*
	p		.000	.000	.001	.001
Weight	r		1	.907**	-.027	.034
	p			.000	.750	.689
BMI	r			1	-.034	.028
	p				.693	.738
MUAC	r				1	-.027
	p					.751
Calf circumference	r					1
	p					

*p<0.01 Spearman's rho correlation test

There were highly significant correlations between MNA and weight, BMI, MUAC and calf circumference at P values 0.000,0.000, 0.001, & 0.001, respectively (Table 4.5).

The current study observed significantly lower BMIs, MUAC and CC among the malnourished patients compared with those who had well nutritional condition and were at malnutrition risk (Table 4.6).

Table 4.6. Comparisons between nutritional status, BMI, MUAC & CC

Variables	Malnourished	At risk of Malnourished	Normal status	P value
BMI	19.74±2.76	24.45±4.74	25.41±9.21	0.00

MUAC	21.54±1.50	21.94±0.930	22.47±0.914	0.00
CC	30.04±2.62	30.89±3.89	32.28±1.610	0.00

Abbreviations; CC: calf circumference, BMI: body mass index, MUAC: mid-upper arm circumference.



5. DISCUSSION

This is present the first study in Iraq about the nutritional status of known cancer patients. Although the malnourished rate was 20.7% in the current study, 49.3% of patients were at risk of malnutrition. In a large-scale study of 44,3061 cancer patients, 72.7% of the patients were identified as malnourished or at risk of nutritional deficiencies (D'Almeida et al., 2020). In a descriptive study carried out in Syria, the findings indicated that 40.8% of patients had normal nutritional status, 39.8% were at malnutrition risk, and 19.4% were malnourished (Hallaj, 2015). In a study conducted with adult individuals with hematological cancer in Turkey, 55.7% were found to be at risk of malnutrition (Özel & Alphan, 2019). In their study, Çınar et al. stated that according to the MNA screening tool, 57.4% of participants had malnutrition, 27.8% had malnutrition risk and 14.8% had adequate nutrition (Çınar et al., 2017). In another study, patients were divided into three groups according to the MNA score: 29.4% were well-nourished, 46.1% were at risk of malnutrition, and 24.5% were malnourished. Weight loss of more than 10 kg in the preceding six months was observed in the last group, which was associated with reduced food intake due to sickness, dyspepsia, and early satiety in the preceding 6 months (Daniele et al., 2017). In a retrospective study, the findings indicated that 82.5% of the patients were malnourished (Christian, & Camacho-Limas, 2017). In a case-control study, 65.22% of participants with GIC had moderate malnutrition and 21.74% had severe malnutrition (Jamshidi et al., 2018). A cross-sectional study conducted in Brazil revealed that 23.3% of patients were well-nourished, 56.7 % were considered to be moderately malnourished or suspected to be malnourished, while 20 % were considered to be extremely malnourished (Ariélen et al., 2018).

In a descriptive study conducted in Iraq, 40.2% of participants were malnourished, 35.2% were at risk of malnutrition and 24.6% had normal nutritional status (Ibrahim et al., 2019). In a cross-sectional study conducted in Baghdad, 76% of the elderly had normal nutritional status, 20.7% were at malnutrition risk, and 3.3% were malnourishments (Al-Kazrajy, & Hammadi, 2020).

Studies confirm that the incidence of malnutrition is between 25% and 85%, especially in individuals with cancer. There are many factors associated with malnutrition.

In the current study, a statistical difference was found between social status, economic status and family history, with MNA scores ($p < 0.05$). Also, there was no significant statistical relationships between the MNA of patients with age, gender, education, resident, smoking, drinking, diagnosis of illness, type of treatment, and complaint of previous health problems. D'Almeida and et al. female sex, age, hospitalization in the southern portion of the country, and the existence of haematological cancers or tumours in the head, neck, upper GIT, and chest were all found to be linked with malnutrition. Hallaj (2015) found that there was a significant statistical relationship between the MNA of patients with age, education, and source of income. Similarly, Ibrahim et al. (2019) found that there was a significant statistical correlation between the MNA of patients with gender. In the study by Tanjani et al., women were more malnourished or at risk of malnutrition compared to men .

The duration of stay in hospitalization increased notably as nutritional status become progressively worse, and there was also an important reduction in BMI and CC among malnourished patients, parallel to well-nourished patients and patients at nutritional risk (D'Almeida et al., 2020). Among patients, 18.4% had CC less than 31, 8.6% had MUAC less than 21 and 11.4% had BMI less than 19. A study in Brazil found 8.7% of patients had CC less than 31 and 18.2% had BMI less than 19 (D'Almeida et al., 2020).

Hallaj (2015) found that patients had BMI of 22 kg/m^2 , CC 32.5 cm, and MUAC 24.4 cm. In another study, the findings indicated that patients with GIT cancer had body mass index of 20.53 kg/m^2 , MUAC 27.49 cm, and CC of 30.88 cm (Jamshidi et al., 2018). The findings of a cross-sectional validation study revealed that body mass index was 24.03 and mid-upper arm circumference was 25.15 (Prado & Campos, 2015). Christian, & Camacho-Limas (2017) found that 96% of patients had weight loss and 75.5% of patients had some activity limitation.

In these studies, it was observed that utmost of the participant's had BMIs over the malnutrition values (D'Almeida et al., 2020).

According to MNA-SF, BMI and CC values, there were significant decreases with bad nutritional status, which is coordinated with a past study of lung cancer patients (Ye et al., 2018).

Al-Kazrajy & Hammadi (2020) found that 73% of patients ate three meals, 79.67% ate dairy products every day, 67.7% ate 2 serving fruits in a day, 52% consumed more than 5 cups of fluid, and 85.3% viewed themselves as being malnourished.

Adequate and balanced diet should be maintained during cancer treatment as it contributes to a decrease in the risk of infection, faster recovery, milder recovery from side effects that may arise from treatment, provides sufficient energy and strength, maintains the body's energy stores and weight, ensure the patient feels better and increases the quality of life (Kara&Kübra, 2015).

Insufficient consumption of macronutrients may be closely related to mortality levels that may occur within a few weeks in patients (Parlak, 2015).

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusion

Among conclusion, malnutrition and nutritional risk are prevalent in Iraqi cancer patients who are admitted to hospitals for treatment. According to these findings, it is necessary to give priority to appropriate nutrition management. Thus, attention is drawn to the urgent need for early nutritional screening to aid in the reduction of mortality, the improvement of quality of life, and the reduction of hospital expenditures, particularly considering the fact that these patients have lengthy hospital admissions.

From the study findings, it can be concluded that

- Approximately half of cancer patients are at danger of malnutrition.
- About half of patients have decreased food intake and weight, few of them suffered from psychological stress, half of them have dementia, few patients are dependent on another person and take prescription drugs, few patients have skin ulcers, and few of them skip meals. Most patients have good consumption of dairy, milk, eggs and meat, fish or poultry, fruits and vegetables, less than half of them have some difficulty in eating, and few of them need assistance in mobility.
- The findings indicated that there is a significant statistical relationship between the MNA of patients with their social status, economic status, and family history of cancer.
- There were no significant statistical relationships between the MNA of patients with age, gender, education, resident, smoking, drinking, diagnosis of illness, type of treatment, and complaints about previous health problems.

6.2. Recommendations

It is suggested that:

- Frequent nutritional status assessment be performed at regular periods for elderly patients with GIT cancer and detection of any health problems.
- A nutritional program be used to enhance their nutritional status and prevent malnutrition
- Make it a point to eat "little and often" — three modest meals with frequent in-between snacks of high-protein, energy-dense foods. Encourage folks to consume a meal every two to three hours (or more frequently).
- Optimize meal times to encourage a healthier appetite, for example, if someone is hungry in the morning, recommend a cooked breakfast such as eggs or baked beans.
- Offer meals and snacks that are visually appealing in both size and look — big meals can be intimidating, so use small plates and make the food as visually appealing as possible.
- Food must be consumed in order to be beneficial - urge the patient to choose favourite foods that can be consumed at any time of day, for example, cereal for supper and soup for breakfast.
- Take a short walk before your meal to help stimulate your appetite.
- Soft foods, which need little chewing, are a good choice.
- Make use of prepared foods such as frozen dinners, canned goods (soup, fruit, beans, fish), ready-made desserts (custard, yoghurt, rice pudding), snack bars, and breakfast cereals to save time.
- Oral nutritional supplements should be used as an addition to food consumption rather than as a substitute; they should be administered between meals rather than at mealtimes.

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Appendix 1: Questionnaire

Title Questionnaire:

Identify of changeable elements of malnutrition in adult GIT cancer patients.

Purpose of Questionnaire:

- To recognize and exploring the changing preventive methods in malnutrition for GIT cancer patients.
- Put an early prevention for these patients in order to reduce the problems and complications of malnutrition.

DIRECTIONS: This questionnaire that is in my hands is part of the requirements for obtaining a master's degree in the field of public health nursing for Çankırı University in Turkey. You have the choice of whether or not to participate in this research.

This questionnaire contains data about your current Socio- demographic data and your nutritional patterns and problems that you may be suffering from it.

Please respond to each item as accurately as possible, and try not to skip any item and give a correct answers if there are things that you cannot understand and are not clear to you, or if you want more information, ask me to do so.

Researcher : Abdulrahman Yahya jelwi AL-Janabi

Supervisor: Dr.Öğr.Üyesi Huri Seval Gönderen Çakmak



Part one: Socio-demographic data

1. Age	
2. Gender	☐ Male ☐ Female.
3. Educational level	☐ Illiterate. ☐ Literate. ☐ Elementary school. ☐ Secondary school. ☐ Associate degree. ☐ Graduated. ☐ Postgraduate/Doctorate.
4. Resident	☐ Urban. ☐ Sub_urban. ☐ Rural.

5- Social status:

☐ Single, ☐ Married, ☐ Divorced,
☐ Widower, ☐ Separated.

6- Economic situation:

☐ Enough, ☐ Hardly enough, ☐ Not enough.

7- Do you smoke? ☐ Yes, ☐ No.

8- Do you drink alcohol? ☐ Yes, ☐ No.

9-Diagnosis of illness:

10-Is there a family history of cancer? ☐ Yes, ☐ No.

11-Type of treatment:

☐ Surgical ☐ Chemotherapy ☐ Radiotherapy
☐ Combination therapy.



12-You complain of previous health problems in the digestive system before the diagnosis? ☐ Yes, ☐ No.

Part Two: Data related with Health history, Physical and nutritional :

1- Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?

- ☐ Severe decrease in food intake,
☐ Moderate decrease in food intake,
☐ No decrease in food intake.

2- You Weight loss during the last 3 months?

- ☐ Weight loss greater than 3kg,
☐ Does not know,
☐ Weight loss between 1 and 3kg,
☐ No weight loss.

3- Has suffered psychological stress or acute disease in the past 3 months?

☐ Yes, ☐ No

4- Are you have a neuropsychological problems?

- ☐ Severe dementia or depression, ☐ Mild dementia,
☐ No psychological problems.

5. Body mass index = weight in kg/(height in m)²

- | | |
|---|---|
| ☐ BMI less than19 | ☐ BMI 19 to less than 21 |
| ☐ BMI 21 to less than 23 | ☐ BMI 23 or greater |



6. Lives independently (not in nursing home or hospital)?

☐ Yes ☐ No

7. Are you take more than three prescription drugs per day?

☐ Yes ☐ No

8. Do you have pressure sores or skin ulcers?

☐ Yes ☐ No

9- How many full meals do you eat every day?

☐ One meals ☐ Two meals ☐ Three meals.

10- How you Selected consumption markers for protein intake:

- At least one serving of dairy products (milk, cheese, yoghurt) per day?

☐ Yes, ☐ No.

- Two or more servings of legumes or eggs per week?

☐ Yes, ☐ No.

- Meat, fish or poultry every day?

☐ Yes, ☐ No.

11. Are you consumes two or more serving offruit or vegetables perday?

☐ Yes ☐ No

12- How much fluid (water, juice, coffee, tea, milk...)?

☐ Less than 3 cups,

☐ 3 to 5 cups,

☐ More than 5 cups.

13- How do Mode of feeding?

☐ Unable to eat without assistance,

☐ Self-fed with some difficulty,

☐ Self-fed without any problem.



14- Self view of nutritional status

- ☐ Views self as being malnourished,
☐ Is uncertain of nutritional state,
☐ self as having no nutritional problem.

15- In comparison with other people of the same age, how does the patient consider his / her health status?

- ☐ Not as good, ☐ Does Not know, ☐ As good, ☐ Better.

16_ Mild_arm circumference (MAC) in cm:

- ☐ MAC 21 to 22 ☐ MAC less than 21
☐ MAC greater than 22

17_ Calf circumference (CC) in cm:

- ☐ CC less than 3 ☐ CC 31 or greater

18_ How can you move (mobility)?

- ☐ Bed or chair bound
☐ Able to get out of bed/chair but does not get out
☐ Goes out.



Appendix 5: C.V

Name and surname : Abdulrahman Al-Janabi

Birthplace and date :Babil ,Iraq

Contact address and phone : Email :

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Education status

- Undergraduate: 2013, University of Mosul, College of nursing

