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Prevalence of Malnutrition among Hospitalized Patients at Benghazi Medical Center

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Abstract— ***Background: Malnutrition is associated with many adverse clinical outcomes, including longer length of stay, increased morbidity and mortality, and increased hospital costs. Objective: This study was conducted to identify the prevalence of malnutrition in hospitalized patients in Benghazi Medical Center. Subjects and methods: in this cross sectional descriptive study of 200 patients admitted to Benghazi Medical Center in different departments, were the risk of malnutrition were assessed and evaluated by using malnutrition universal screening tool (MUST). Results: The malnutrition rate in the hospitalized patients was found to be 41 % (n= 82) with malnutrition (high risk), 40% (n = 80) had low risk of malnutrition and 19% (n = 38) had moderate malnutrition. Conclusions: The prevalence of malnutrition among hospitalized patient in Benghazi medical center was found to be 60% from the total of the participants where 41% had high risk of malnutrition and 19% moderately at malnutrition risk according to MUST. And also the patients over 60 years and those admitted for medical treatment had a significantly higher malnutrition rate than the other groups of the participants (P = 0.031) (p = 0. 003) respectively as well as length of hospital stay was strongly associated with high risk of malnutrition stay.***

Keywords- ***Malnutrition, Nutrition assessment, Hospitalized, patients.***

I. INTRODUCTION

Malnutrition is related to many negative clinical outcomes, collectively with longer period of stay, advanced morbidity and mortality, and advanced hospital costs. [(1)]

And its defined as the imbalance between intake and requirement which results in altered metabolism , impaired function and loss of body mass [(2)] or as a state of nutrition in which a deficiency or Imbalance of energy, protein, and different vitamins reasons measurable destructive outcomes on tissue and/ or frame form.[(3)]

The European Society for clinical Nutrition and metabolism (ESPEN) has recently put forward a consensus definition for malnutrition with aim to reach uniformity between countries and between studies [(4)]. In accordance with the Dutch definition, patients with a low BMI are described as malnourished with this new consensus definition. However, in contrast to the definition, the ESPEN diagnostic criteria for malnutrition only define a patient malnourished if he has lost weight in combination with a low BMI or a low fat free mass index (FFMI). Recently, the definition of malnutrition has been clarified through the European Society of Parenteral and Enteral Nutrition (ESPEN) to highlight the differences between cachexia, sarcopenia (loss of muscle mass and function) and malnutrition [(5)]. Cachexia can be defined as a multifactorial syndrome characterized by severe body weight, fat and muscle loss and increased protein catabolism due to underlying disease(s) [(5)]. Therefore, malnutrition seen in hospitalized patients is often a combination of cachexia (disease-related) and malnutrition (inadequate consumption of nutrients) as opposed to malnutrition alone. The definition of malnutrition adopted refers to the complex interplay between underlying disease, disease-related metabolic alterations and the reduced availability of nutrients (because of reduced intake, impaired absorption and/or increased losses or a combination of these) which is a combination of cachexia and malnutrition

Malnutrition can propose under-nutrients or over-nutrients intake. It can also endorse an imbalance of macronutrients (proteins, carbohydrates, fats) or micronutrients (vitamins and minerals). [(6)]

A. Under nutrition

Under-nutrition is a deficiency of nutrients, can cause visible wasting of fat and muscle, and it can also be invisible. It is classified into macronutrient and micronutrient under nutrition. [(7,8).] Macronutrient under nutrition also referred to as protein-energy under-nutrition that could be a deficiency of macronutrients:(proteins, carbohydrates and fats.
Macronutrients are the main building blocks of the diet, the nutrients that the body relies on to produce energy to maintain itself. Without them or even just one of them, the body soon begins to fall apart, breaking down tissues and shutting down nonessential functions to maintain its low energy. [(7, 8)]

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Micronutrient under nutrition : like vitamins and minerals. The body needs these in smaller amounts, for all of its vital functions. Many people are moderately deficient in certain vitamins and minerals from a lack of variety in their diet. Also it can begin to have serious and lasting effects. (7, 8)

Over nutrition: The World Health Organization (WHO) has recently added over nutrition to its definition of malnutrition to understand the adverse health outcomes that can be due to excessive consumption of nutrients. This includes the effects of overweight and obesity, which are strongly associated with a list of non-communicable diseases (NCDs) such as diabetes mellitus, coronary artery disease and stroke. It also includes the toxicity that can result from over consumption specific micro nutrients. Actually overdose of vitamin and mineral supplements. In general, micronutrient (vitamins and minerals) over nutrition is uncommon and doesn't occur from diet alone. But it can have toxic effects. (8, 9)

B. Causes of Malnutrition

Malnutrition, e.g. Under-nutrition, can be as a result of compromised consumption or assimilation of nutrients however there is developing appreciation that malnutrition can also be as a result of disease-related inflammatory or different mechanisms. The malnutrition that is associated with disorders or injury invariably consists of a combination of reduced food intake or assimilation and varying levels of acute or chronic inflammation, leading to altered body composition and diminished biological function. (6,7,8) Inflammation contributes to malnutrition via related anorexia and reduced meals consumption as well as altered metabolism with elevation of resting energy expenditure (REE) and increased muscle catabolism. Altered body composition manifests as a lower in any marker of muscle tissues (fat-unfastened mass, muscle tissues index or frame molecular mass).Thus, malnutrition is related to adverse functional and clinical outcomes.(8,9) Although malnutrition among hospitalized patients is not rare, it is occasionally Overlooked either because medical resources, such as the availability of nutritional specialists or hospital systematic and financial support, are insufficient, or because clinicians do not consider malnutrition to be a vital issue. (1, 9, 10, 11) In developed countries the main cause of malnutrition is disease. Whether chronic and acute, has the potential to result in or aggravate malnutrition in more than one way: response to injuries, infection or inflammation may alter metabolism, appetite, absorption, or assimilation of nutrients. (12) Mechanical obstructions in the gastrointestinal tract may lead to reduced food intake by causing nausea or vomiting, pain or discomfort induced by the passage of food.

C. Dietary intake

Probably the single most important etiological factor in disease-related malnutrition is reduced dietary intake. This is thought to occur due to lack of appetite sensation as a result of changes in cytokines, glucocorticoids, insulin and insulin-like growth factors. (12, 13)

D. Malabsorption

For patients with intestinal failure and those undergoing abdominal surgical procedures (major surgery), malabsorption represents an independent risk factor for weight loss and malnutrition. Increased losses and altered requirements.(13,14) In some circumstances, such as enter cutaneous fistula or burns, patients may have excessive and/or specific nutrient losses; their dietary requirements are usually very different from normal metabolism.(13)

E. Energy expenditure

Patients with major trauma, head injury or burns where energy expenditure may be considerably higher.(14,15) Malnutrition is associated with negative outcomes for patients, including higher infection and complication rates, increased muscle loss, impaired wound healing, longer length of hospital stay and increased morbidity and mortality (infection cycle). (16-19) Drug related side effects can cause anorexia or interfere with the ingestion of food. In geriatric patients further factors such as dementia, immobilization, anorexia, and poor dentition can further worsen the situation. (20, 21) The reasons for developing malnutrition in illnesses are multi factorial, but decreased nutritional intake, increased energy and protein requirements, increased losses together with inflammation probably play the central role. (21) Apart from the pathological causes for malnutrition, socioeconomic factors such as low income and isolation may also contribute to the development of malnutrition. (22)

F. Pathogenesis

Macronutrient undernutrition (protein-energy undernutrition) deprives the body of energy to sustain itself. To compensate, it starts breaking down its own tissues and shutting down its functions. This begins with its body stores of fat and then proceeds to muscle, skin, hair and nails. People with protein-energy malnutrition are often visibly emaciated. Children may have stunted development and growth. (23, 24) One of the first systems to begin to shut down is the immune system (defense system). This makes undernourished patients highly prone to illness and infection and slower to recover. Wounds take longer to heal. Cardiac activity also slows down, leading to decreased heart rate, low blood pressure and low body temperature. Patients may feel faint, weak, fatigue and apathetic about life. They may lose appetite, and parts of their digestive system (GIT) can atrophy. (25)

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People who have macronutrient malnutrition are likely to also have micronutrient undernutrition. When overall energy are lacking, that affects vitamin and mineral levels too. Some of the complications of severe malnutrition conditions, such as marasmus and kwashiorkor, result from particular vitamin deficiencies. Such as, vitamin A deficiency can cause vision problems, and vitamin D deficiency can cause soft bones.(26) Some people may consume a lot of calories, but not enough minerals and vitamins . In these conditions, the effects of malnutrition may be less obvious. People may be overweight from macronutrient over consumption but may have symptoms of anemia, weakness, faintness and fatigue due to the lack of minerals or vitamins. People who have over nutrition may show symptoms of metabolic syndrome, such as high blood pressure and insulin resistance. (26, 27)

G. Signs and Symptoms of malnutrition

The signs and symptoms of malnutrition as loss of fat (adipose tissue), breathing difficulties, a higher risk of respiratory failure, higher risk of complications after surgery, higher risk of hypothermia, abnormally low body temperature, higher susceptibility to feeling cold, longer healing times for wounds, longer recovery times from infections, longer recovery from illnesses, problems with fertility, reduced muscle mass, reduced tissue mass, fatigue, or apathy and irritability etc. (28)

H. Malnutrition and Its Associated Consequences

Malnutrition has often been referred to as the skeleton in the hospital closet‖, as it is often overlooked, undiagnosed and untreated (29, 30). Despite this, the negative consequences of malnutrition have been widely reported in the literature, and can be separated into two main categories: consequences for the patient and consequences for the health care facility.

I. Consequences for the Patient

Malnutrition has been shown to cause impairment at a cellular, physical and psychological level (31-33) This impairment is dependent on many factors, including the patient‘s age, gender, type and duration of illness, and current nutritional intake. On a cellular level, malnutrition impairs the body‘s ability to mount an effective immune response in the face of infection, often making infection harder to detect and treat (34). It also increases the risk of pressure ulcers, delays wound healing, increases infection risk, decreases nutrient intestinal absorption, alters thermoregulation and compromises renal function (31-33,35).

On a physical level, malnutrition can cause a loss of muscle and fat mass, reduced respiratory muscle and cardiac function, and atrophy of visceral organs (31, 32, 36). It has been shown that an unintentional 15% loss of body weight causes steep reductions in muscle strength and respiratory function, while a 23% loss of body weight is associated with a 70% decrease in physical fitness, 30% decrease in muscle strength and a 30% rise in depression (33). At a psychological level, malnutrition is associated with fatigue and apathy, which in turn delays recovery, exacerbates anorexia and increases convalescence time.

J. Diagnosis and Treatment

The Global Leadership Initiative on Malnutrition (GLIM) malnutrition diagnosis is based on widely recognized criteria that were selected based on their inclusion in all major existing diagnostic tools (37, 38). Three phenotypic (losing of body weight, low body mass, and low skeletal muscle mass) and two etiologic (low food intake and presence of disorders or systemic inflammation) criteria were proposed, with malnutrition confirmed by any combination of one phenotypic and one etiologic criterion. The first step to successfully treat malnutrition is the appropriate diagnosis. There are two major difficulties linked to that issue: the first one is the definition of malnutrition and the second is choosing an appropriate screening tool to assess the risk. (37) Overall appearance, behavior, body fat distribution throughout the body and organ function can alert a physician to the presence of malnutrition. Patients can be asked to record what they eat during a specific period. X-rays can determine bone density and re-veal gastrointestinal disturbances, as well as heart, liver and lung damage. (38) Blood, plasma and urine tests are used to measure the patient's levels of vitamins, minerals and waste products.

K. Treatment

The management of hospital malnutrition is more difficult because there is no one method that can be employed isolately as a “gold standard” in nutritional diagnosis. (39) Thus, in clinical medical practice, different methods are adopted, according to the convenience of each institution, service or patient. This unavailability of a standard makes it difficult to establish the comparisons between institutions, or in the same institution along the time. Combinations of techniques can enhance the accuracy of the dietary diagnosis. (40, 41) However, patients who cannot or will not eat or who are unable to absorb nutrients taken by orally may be fed intravenously (parenteral nutrition) or through a tube inserted into the gastrointestinal tract (enteral nutrition). Tube feeding is often used to provide nutrients to patients who have suffered burns or who have inflammatory bowel disease and some type of cancer. This procedure involves inserting a thin tube through the nose and carefully guiding it along the throat until it reaches the stomach (naso-gastric tube) or small intestine (gastrostomy). If long-term tube feeding (EN) is necessary, the tube may be placed directly into the stomach or small intestine through an incision in the abdomen. (41)

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II. METHODS AND MATERIALS

A. *Research sitting and period:*

This research was carried out at Benghazi Medical Center in June 2022.

B. *Study design*

A cross sectional descriptive study of all hospitalized patients at Benghazi Medical Center.

C. *Subjects*

The study was carried out among hospitalized patients aged 20–90 years; the inclusion criteria were, all admitted patients to the Benghazi Medical Center departments were available at the time of data collection between the 7th of June and the 1st of July 2022, regardless of the departments of admission A convenient sample was obtained from the patients and was found to be (n = 200), of which 92 were males and 108 were females.

The exclusion criteria were as follows: patients who were pregnant, obstetric, or pediatric. Comatose patients without relatives or friends to answer the questions, aged < 18 years, and planned to be discharged within 24 hours.

D. *Procedure*

Data was collected by using a pre-designed questionnaire that contains (socio-demographic characteristics, anthropometric measurements, medical information, and an assessment of nutritional status. A questionnaire was completed by each participant to obtain information about age, sex, personal income, level of education, department of admission, diagnosis, and length of stay at the hospital.

This questionnaire was checked immediately to ensure that the participant answered all questions. Informed consent was obtained from the participant, and so all the necessary steps for carrying out these (anthropometric measurements) were done in a private setting without mentioning the participant's name. The required information from the subject was collected by the researcher after giving them a briefing about the goal of the study. The hospital administrators and the director of the dietary department were informed in writing about the aim of the study to obtain the maximum possible cooperation to conduct it.

A pilot study was conducted to test the questionnaire before starting the data collection. About 20 patients were included and accordingly, the questionnaire was modified.

E. *Statistical analysis*

Data were analyzed using a statistical package for social science (SPSS) version 18. Descriptive statistics such as mean, maximum, minimum, and standard deviation were used. Inferential statistics were used when needed; the statistical significance of an association between categorical variables was assessed by using the correlation test (r). The correlation between the variables was calculated and considered significant when P 0.05. Data were presented in the form of tables and figures, where the figures were done by Microsoft Excel 2010.

F. *Anthropometric measurement*

The following measurements were taken by the investigator in a private place. Weights (usual and admission weights); Weight was measured in kilograms, height was briefly measured in centimeters, and participants were standing and dressed in light indoor clothing without shoes. For anthropometric measurement, an Omron digital personal scale was used to obtain weight (Kg).Weight was measured to the nearest 0.1 kg; the scale was calibrated before examination.
Height was measured without shoes and with shoulders in a normal position. By using a tape measure. The body mass index was calculated as weight in kilograms divided by height in meters squared. In the current study, general obesity is defined as a BMI 30 kg/m2. [25, 26]

G. *Nutritional status and dietary intake assessment*

The dietary intake was investigated by questioning the patients about recent body-weight changes, type of feeding (normal, enteral, or parenteral), and following any special diets regarding his or her medical situation, and the source of meals served to them.

H. *Malnutrition Screening and Assessment*

Identifying malnutrition or malnutrition chance is essential to its treatment. It is probable that many validated tools for nutrition risk screening and nutrition assessment exist for the clinician and specialists to use in furthering the accurate identification, referral, and treatment of patients who are malnourished or at risk of malnutrition. The American Dietetic Association (ADA) defines screening for nutrition risks as the process of identifying patients with characteristics commonly associated with nutritional problems that may require a comprehensive nutrition assessment [42]. In contrast to nutrition risk screening, the American Dietetic Association defines nutrition assessment as an interdisciplinary approach to defining nutritional status by using medical, nutritional, family, and medication histories; physical examination, anthropometric measurements, and laboratory data [42];

Essentially, assessment of nutrition is a diagnostic tool to determine if a patient is currently malnourished, though it does require considerable skill and time to perform nutrition risk screening.

I. Nutrition Screening and Assessment Tools

Numerous nutrition screening and assessment tools exist to identify risks and diagnose malnutrition. Recent evidence-based practice guidelines published and approved by the Dietitians Association of Australia considered levels of evidence for the use of corroborated screening and assessment tools in the acute setting as well as other areas (43). They reported on five screening and three assessment tools validated for use in the acute setting and hospitals. These recommendations supplied a Grade B (good) National Health and Medical Research Council (NHMRC) grade of recommendation that practices of nutrients and danger screening should get up in the extreme setting, but only a Grade D (poor) recommendation for the adoption of screening in the sub-acute, residential aged care, and community settings. The Malnutrition Screening Tool (MST) is an elementary, three-question tool assessing cutting-edge weight and appetite loss validated for use in general medical, surgical, and oncology patients (44, 45). The Mini Nutrition Assessment (MNA) was progressed specifically for use among elderly patients (≥65 years) in hospitals, nursing homes, and the community and is thus restricted to this demographic (44, 46). The original form considered anthropometric, medical, lifestyle, dietary, and psychosocial factors in an 18 item assessment, using a points-based scoring system to determine if a patient was at risk of malnutrition (44, 47). The short-form MNA (MNA-SF), which is an abridged version of the MNA, provides a two-step nutrition screen, with the full MNA completed only for those patients at nutritional risk (48–50). Nutritional Risk Screening (NRS-2002) uses current weight loss, decreased BMI, and reduced dietary intake, combined with a subjective assessment of disease severity (based on increased nutrient requirements and/or metabolic stress), to generate a nutrition risk score (51). Such subjective grading of illness severity may not accurately reflect recent nutritional status, and the tool does not allow for a definitive diagnosis of malnutrition. The NRS tool has, however, been recommended for use in hospitalized patients by ESPEN and may be useful for prompting the initiation of nutrition support (52, 53). The Short Nutrition Assessment Questionnaire (SNAQ) was developed to diagnose malnutrition in hospitalized patients and give an indication for dietetic referrals as well as outline a nutrition treatment plan (54, 55). It has been confirmed for hospital inpatient and outpatient use, as well as residential patients, and does not require calculation of BMI (56, 57). Subjective Global Assessment (SGA) is one of the commonly used nutrition assessment tools and assesses nutrition status via the completion of a questionnaire that includes data on weight change, food intake change, gastrointestinal symptoms, changes in functional capacity in relation to malnutrition, as well as assessment of fat and muscle stores and the presence of edema and ascites (58). This tool allows for malnutrition diagnosis, and classifies patients as either: A—well-nourished; B—mildly or moderately malnourished; or C—severely malnourished. Linked to the MST, the Malnutrition Universal Screening Tool (MUST) was developed to detect both undernutrition and obesity in adults and was created for use in multiple settings, including hospitals and nursing homes. Body Mass Index (BMI), unintentional weight loss, and the presence or absences of serious disorders allow a score to be derived to indicate whether nutrition intervention is necessary. The MUST has been determined to consistently provide reliable results; however, it is limited by the fact that it has not been validated in children or renal patients (59–62). In this study, the nutrition status was captured with the Malnutrition Universal Screening Tool (MUST),s a five-step screening tool to identify adults, who are malnourished, at risk of malnutrition (undernutrition), or obese. It also includes management guidelines, which can be used to develop a care plan. It is for use in hospitals, community, and other care settings and can be used by all care workers.

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III. RESULTS AND DISCUSSION

Malnutrition has long been recognized as an important component of adverse outcomes, including increased morbidity and mortality and decreased quality of life in patients. The incorporation of nutrition screening and comprehensive assessments is thus increasingly recognized as imperative in the development of standards of quality care in the hospital setting. The prevalence of malnutrition in hospitalized patients has been estimated to be as high as 50%.

A total of 200 hospitalized patients were participating in this study after excluding the participants who did not match the inclusion criteria. Where 108 (54.0%) were females, and 92 (46.0 %) were males. (table I).

TABLE I. *Distribution of the study sample according to gender (socio-demographic data)*

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	Frequency	Percentage
Male	92	46.0
Female	108	54.0
Total	200	100.0

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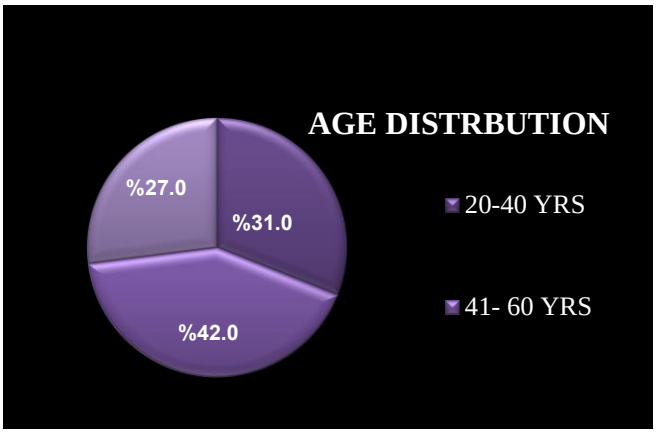

Figure I: *Age groups of the study sample. (n=200)*

A total of 200 patients aged between 20- 40 year, 62(31.0%) while 84(42.0%) aged between 41-60 year and 54 (27.0%) more than 60 years. (Figure. I)

TABLE II. *Distribution of the participant according to the department of the admission*

	Frequency	Percentage
Medical	**128**	**64.0**
Surgical	**72**	**36.0**
Total	**200**	**100.0**

The majority of the patients were admitted to the medical ward by the percentage of 128 (64.0%). While the minority were admitted to surgical department by 72(36.0%). (Table.II)

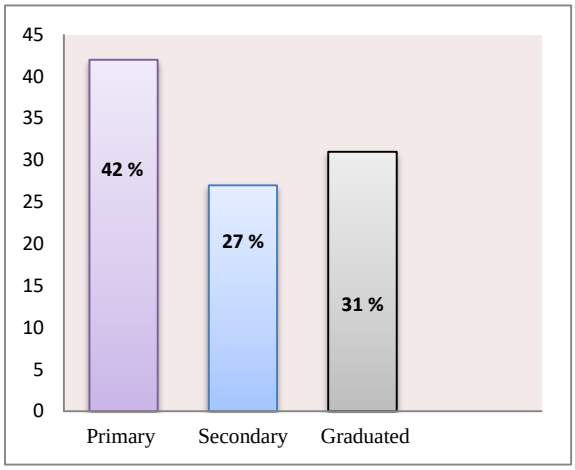

Figure II: *Distribution of patients according to education levels*

On the other hand, the patients with a bachelor's degree were 62 (31.0%) (Graduated from university) and 84 (42.0%) relative to those with a primary school education, while a relatively small percentage of the sample—54 (27.0%)—were graduates from high institutes and centers (secondary education level) (Figure II).

TABLE III. *Distribution of personal income of the participants.*

	Frequency	Percentage
less than 500LD	55	27.5
500-1000LD	90	45.0
1000-2000LD	38	19.0
More than 2000LD	17	8.5
Total	200	100.0

Personal income of 55 (27.5%) of participants was less than 500LD per month, with 90 (45.0%) having between 500-1000LD monthly, 38 (19.0%), 17 (8.5%) having between 1000-2000 LD and more than 2000 LD per month.(Table.III)

TABLE IV. *Length of staying at the hospital*.

	Frequency	Percentage
First day	43	21.5
Three days	50	25.0
Five days	6	3.0
one week or more	101	50.5
Total	200	100.0

Regarding the length of staying at the hospital in different departments, the highest percentage was recorded for the patients who stay for one week or more: 101 (50%) compared with 50 (25.0%) who stay for three days, followed by 43 (21%) who spend their first day at the hospital and 6 (3%) who are admitted within five days. (Table.IV)

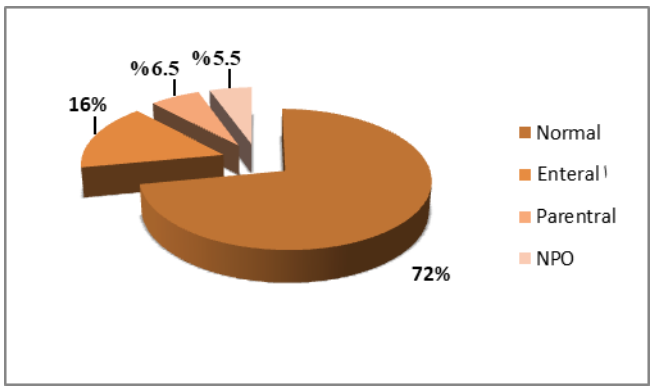

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Figure III: *Type of feeding*

However, the study participants were predominantly on normal (oral) diet with the percentage of 144 (72%), and 32 (16%) were on enteral feeding, while the patients who on parenteral feeding were 13 (6.5%), and only 11 (5.5%) were NPO. (Figure.III).

TABLE V. *Distribution of the patients regarding to following any special diet or not.*

	Frequency	Percentage
Yes	75	37.5
No	125	62.5
Total	200	100.0

The participants who did not follow any special diet were 125 (62.5%), while 75 (37.5%) of patients followed a special diet regarding their situation and health conditions (Table V).

TABLE VI. *Source of the food for the patients.*

	Frequency	Percentage
Fasted	38	19.0
Hospital	39	19.5
Home	48	24.0
Restaurant	4	2.0
Hospital and Home	31	15.5
Hospital, Restaurant, and Home and Restaurant	40	20
Total	200	100.0

However, the study participants received their food from home in the percentages of 48 (24%), 40 (20%), and they depend on multiple sources to serve their foods, like home, hospital, and restaurants, While the patients who received their food from the hospital were only 39 (19.5%), the patients who did not eat at all regardless of their causes were 38 (19%), 31 (15.5%) was takes their meals from both hospital and home, and only 4 (2%) had their meals from restaurants. (Table.VI)

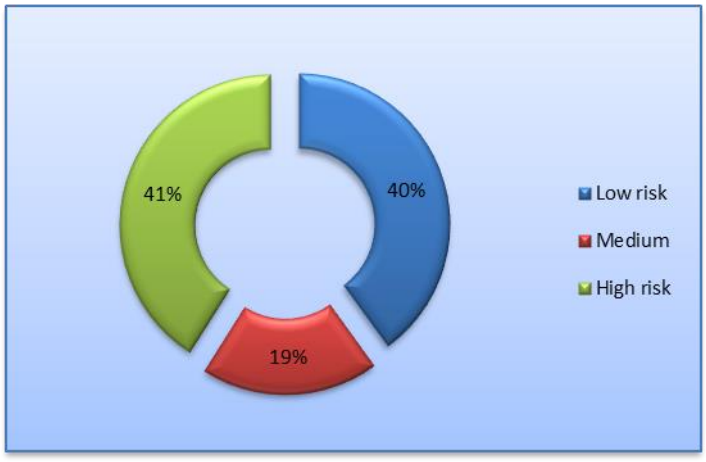

Figure IV: *Distribution of the participants according to malnutrition risks*

The malnutrition rate in the hospitalized patients was found to be 41% (n = 82) with malnutrition (high risk), 40% (n = 80) with low risk of malnutrition, and 19% (n = 38) with moderate malnutrition. (Figure.IV).

In this cross-sectional study in Libya, Benghazi (Benghazi medical center), 41% of the hospitalized patients had a high risk of malnutrition according to the malnutrition universal screening tool (MUST). This rate corresponds with those in other studies that evaluated the hospital malnutrition rate. An Argentinian study performed in 2003 by Diego F. et al. [63] reported that approximately 47% of hospital patients have some degree of malnutrition and in the Brazilian National Survey on Hospital Nutritional Assessment survey performed in Brazil, the malnutrition rate turned out to be decided to be 48.1% [64]. For instance, an Australian study performed in 2008 by Gout et al. [65] reported a 23% malnutrition rate in tertiary hospitals using the SGA rank, and a German study conducted by Pirlich et al. [66] reported a malnutrition rate of 27.4% in the study. Unlike our study, these studies only evaluated nutritional status at the point of admission. But our study includes all hospitalized patients, regardless of the time of admission. Age was a significant risk factor for malnutrition. Of the patients over 60 years old, 17.5% had an important higher malnutrition rate than the younger patients (17.5% vs. 10%, P = 0.031). The aforementioned German

study (66) also reported a high prevalence of malnutrition in aged patients (43%). Many social, physiological, and psychological changes ensue as patients get older, which makes the elderly particularly vulnerable to malnutrition. The patients admitted for diagnostic work-up or medical treatment exhibited a higher malnutrition rate (28.5%) than those admitted for elective or optional surgery (11.5%). This may be explained by the fact that the latter group of patients was unlikely to have acute medical diseases at the time of admission. A relatively low malnutrition rate in patients admitted for elective surgical treatment was also observed in other studies (66). Malnutrition is known to worsen many clinical outcomes. In the present study, a poor nutritional status (malnutrition) was associated with a longer length of hospital stay (one week and more) compared with the first three to five days of admission, with a statistically significant difference (24% vs. 2.5%, p = 0.003). Several nutritional factors (e.g., unintentional weight loss and low BMI) have been shown to be associated with prolonged lengths of stay. However, the novelty of our study is the multivariable approach. Not eating while in the hospital might be detrimental to the patient's recovery. Indeed, this is a multifactorial phenomenon. Patients may experience psychological (e.g., depression, anxiety) reasons. Impaired cognitive function and dissatisfaction with hospital meals may also compromise food intake. Furthermore, prolonged and unjustified orders for nothing by mouth may be prescribed because of diagnostic procedures and medical or surgical interventions. Our observation that in-hospital weight loss of 5% or more was associated with a prolonged hospital stay is not surprising. Different factors contribute to weight loss during a hospital stay, such as the underlying disease, the catabolic stress related to medical and surgical interventions, insufficient oral intake or fasting, and the inappropriate management of the nutritional problems of the patients. Nutritional support was associated with a prolonged length of stay, too. Fortunately, several studies demonstrated that adequate nutritional therapy for patients with malnutrition reduces length of hospital stay, infectious or non-infectious complications, and mortality rate.

IV. CONCLUSION

In this study sample, it is concluded that, the prevalence of malnutrition among hospitalized patients at Benghazi Medical Center was found to be 60% of the total of the participants, where 41% had a high risk of malnutrition and 19% had a moderately high malnutrition risk according to MUST.

And also, the elderly (over 60 years) had a significantly higher malnutrition rate than the younger age group (aged 20–40 years) (17.5% vs. 10%, P = 0.031).A significant difference in malnutrition rates was observed among the reasons for admission. The malnutrition rate was highest in the patients admitted for medical treatment (28.5%), followed by those admitted for elective surgery (11.5%). Length of hospital stay was strongly associated with high risk of malnutrition (one week and more) compared with the first three to five days of admission with a statistically significant difference (24% vs. 2.5%, p = 0.003).

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