T.C.
YEDITEPE UNIVERSITY
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DETERMINATION OF MALNUTRITION STATUS BETWEEN SURGICAL AND NON-SURGICAL ONCOLOGY PATIENTS

MASTER THESIS

Dyt. Aslıhan YAĞCIOĞLU

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SUPERVISOR

Assoc. Prof. Dr. Arzu DURUKAN

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Bu tez Yeditepe Üniversitesi Lisansüstü Eğitim-Öğretim ve Sınav Yönetmeliğinin ilgili maddeleri uyarınca yukarıdaki jüri tarafından uygun görülmüş ve Enstitü Yönetim Kurulu'nun 12/06/2018 tarih ve 2018/10-88 sayılı kararı ile onaylanmıştır.

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Sağlık Bilimleri Enstitüsü Müdürü

DECLARATION

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree except where due acknowledgment has been made in the text.

Date
30.07.2018
Signature

Name Surname
Aslihan YAĞCIOĞLU

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LIST OF SYMBOLS AND ABBREVIATIONS

SGA	Subjective Global Assessment
NRI	Nutrition Risk Index
MNA	Mini Nutritional Assessment
MUST	Malnutrition Universal Browsing Tool
NRS-2002	Nutrition The Risk Score
CRP	C-reactive protein
SR	Free Oxygen Radicals
CHO	Carbonhydrate
ASPEN	American Parenteral and Enteral Nutrition Society
RT	Radiotherapy
BMI	Body Mass Index
MST	Malnutrition Screening Tool
SNAQ	Short Nutritional Assessment Questionnaire in the Netherlands
ESPEN	European Association for Enteral and Parenteral Nutrition
IARC	The International Agency for Cancer
FFQ	Food consumption frequency
BeBiS	Nutrition Informatıon System
RDA	Recommended Daily Allowance
SPSS	Statistical Package for the Social Sciences
DRI	Dietary Reference Intake

EU	European Union
USA	United States of America
RBP	Retinol binding protein

ABSTRACT

Yağcıoğlu, A. (2018) . Determination of Malnutrition Status Between Surgical and Non- Surgical Oncology Patients. Yeditepe University, Institute of Health Science, Department of Nutrition and Dietetics, MSc Thesis, İstanbul.

The aim of this study is to determine the differences between the malnutrition status of the oncologic patients who have not undergone surgical procedure and the malnutrition status of surgical oncologic patients by questionnaire, food records and biochemical results. Cancer patients who applied to Koç University Hospital were followed for 3 months. Biochemical findings of 58 surgically treated and 46 untreated oncology patients were taken and nutritional status of the patient was assessed by a 3- day food record. Malnutrition status of the patients was determined with Mini Nutrition Assesment (MNA) . There was a statistically significant difference in the age of the patients according to the surgical situation. The age of patients who did not undergo surgery was found to be statistically significantly higher than those who underwent surgery. There was a statistically significant difference in terms of MNA values according to the surgical situation. The MNA values of the patients who did not underwent surgery were statistically significantly lower than those who underwent surgery. Patients who did not underwent surgical procedures were malnourished, while patients underwent surgery were at risk of malnutrition. The albumin value of the patients who underwent surgery was statistically significantly higher than those who did not undergo surgery. Statistically significant differences were found in terms of energy (kcal) , protein (g) , fat, fiber, carotene values according to the surgical situation. These values of the patients who underwent surgery were statistically significantly higher than those who did not undergo surgery.

Key Words: Cancer, Surgery, Chemotherapy, Nutrition, Malnutrition

ÖZET

Yağcıoğlu, A. (2018) . Cerrahi İşlem Görmüş ve Cerrahi İşlem Görmemiş Onkoloji Hastaları Arasındaki Beslenme Durumunun Saptanması. Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik Anabilim Dalı, Master Tezi. İstanbul.

Bu tezin amacı cerrahi işlem geçirmemiş onkoloji hastalarındaki malnutrisyon durumu ile cerrahi işlem geçirmiş onkoloji hastalarındaki malnutrisyon durumları arasındaki farkların anket, besin tüketim kaydı ve biyokimyasal sonuçlar ile saptanmasıdır. Koç Üniversitesi Hastanesi'ne başvuru yapan kanser tanılı hastalar 3 ay süresince takip edilmiştir. Cerrahi işlem görmüş 58 ve cerrahi işlem görmemiş 46 onkoloji hastasının biyokimyasal bulguları alınmış ve hastanın tuttuğu 3 günlük besin tüketim kaydı ile beslenme durumları değerlendirilmiştir. Hastalara Mini Beslenme Değerlendirmesi (MNA) uygulanmış ve bu ankete göre hastaların malnutrisyon durumları saptanmıştır. Hastaların malnutrisyon durumu Mini Beslenme Değerlendirme (MNA) ile belirlendi. Cerrahi duruma göre hastaların yaşları arasında istatistiksel olarak anlamlı bir fark bulunmuştur. Ameliyat geçirmeyen hastaların yaşları, ameliyat edilenlerden istatistiksel olarak anlamlı derecede yüksek bulunmuştur. Cerrahi duruma göre MNA değerleri açısından istatistiksel olarak anlamlı bir fark bulunmuştur. Ameliyat geçirmeyen hastaların MNA değerleri, ameliyat edilenlere göre istatistiksel olarak anlamlı derecede düşük olarak saptanmıştır. Cerrahi işlem yapılmayan hastalar yetersiz beslenirken, ameliyat edilen hastalar malnütrisyon riski altında olduğu görülmüştür. Ameliyat geçiren hastaların albümin değerleri, ameliyat geçirmeyenlere göre istatistiksel olarak anlamlı derecede yüksek bulunmuştur. Cerrahi duruma göre enerji (kcal) , protein (g) , yağ, lif, karoten değerleri açısından istatistiksel olarak anlamlı farklılıklar bulunmuştur. Ameliyat geçiren hastaların bu değerleri ameliyat geçirmeyenlere göre istatistiksel olarak anlamlı derecede yüksek olduğu gözlenmiştir. Malnutrisyonun taranması daha sık yapılmalı ve cerrahi tedavi uygulanan hastaların beslenme durumunu belirlemek için hastalara beslenme desteği tedavisi planlanmalı ve uygulanmalıdır.

Anahtar Kelimeler: Kanser, Cerrahi, Kemoterapi, Beslenme, Malnutrisyon

1. INTRODUCTION and PURPOSE

Oncology patients are at risk of malnutrition because both the disease itself and compulsive treatments threaten the nutritional status. It has been concluded that 10-20 % of the deaths of oncology patients are based on malnutrition which is not caused by cancer but by cancer (1) (2) (3) . The diagnosis of malnutrition is difficult and cannot be improved because it cannot be diagnosed. Reduced food consumption and metabolic disorders cause malnutrition. Severe weight loss has been reported in more than 50% of cancer-diagnosed patients. Many patients applied to the hospital after having lost weight and received a cancer diagnosis. However, it may be a late sign of malnutrition and may not be able to detect those who are at risk of malnutrition.

As a result, it is very important that the nutritional status of a cancer patient is evaluated correctly and immediately (4) (5). Nutrition is important in the care and treatment of cancer patients (6) .

Surgery is a common procedure in the treatment of cancer. The risk of postoperative complications is increased in malnourished patients; low albumin, weight loss and low body mass index (BMI) have not always been associated with mortality and morbidity in surgically treated patients (4) . In many studies, malnutrition was assessed in patients admitted to the hospital in general (8) (9) (10) , but the relationship between nutritional status and other variables such as the stage of the disease, type of disease, type of surgery and complications of the disease should also be investigated.

The Mini- Nutritional Assessment (MNA) was validated in more than 600 patients from 3 consecutive studies against anthropometric markers, a 3-day food record, and biochemical markers (5) . The MNA produces a numerical score that distinguishes three groups of patients. A score larger than 23.5 indicates the patient being well fed, 17-23.5 indicates that a patient is under the risk of malnutrition, and lower than 17 indicates that the patient is malnourished. MNA includes an assessment of physical and mental illness and diet, including anthropometry, social status (own home, hospital etc.), mobility (bed injuries, etc.), dementia and subjective assessment after the first screening session. The MNA has also been used in cancer patients and in patients with advanced cancer receiving palliative

chemotherapy to identify those at nutritional risk (6) . The MNA is a simple tool to use and may be administered by nondietetic professionals after minimal training.

Each participant was asked to keep a 3-day food record when they were in the hospital. The participants were asked to record the amounts of foods consumed of in order to increase the accuracy of the portion size. Participants were trained with the manual and reviewed unclear descriptions, errors, omissions, or doubtful entries in FRs and asked the participants to clarify them. The researcher dietitian checked all completed records for accuracy (7) .

In this study, we aimed to investigate how the treatment of the patient affects the nutritional status after having a cancer diagnosis. This study, which will investigate the effect of assessing the nutritional status of surgically treated and unseen patients in oncology, will contribute to the few studies on this subject and will assist by guiding the work to be done in the future. This study aimed to answer the question of how treatment for cancer affects nutrition. The difference in malnutrition status among patients who have undergone surgical treatment due to cancer or who have cancer diagnosis and do not undergo / do not undergo surgery will be determined. It is aimed to have knowledge about the importance of nutrition in oncology patients.

2. GENERAL INFORMATION

2.1. Cancer

Cancer is a disease emerging from uncontrolled cell proliferation and division due to various genetic and environmental factors. Cancer can affect a single organ and also as it can affect the other organs. Although some standards are set, each cancer special approaches and treatments apply. Oncology involves all types of cancer (8) . Treatment methods such as radiotherapy, chemotherapy, surgery, immunotherapy, hormone therapy, gene therapy can be used alone or together in cancer patients (9) . Cancer is a person-specific disease. Each method has its own advantages and disadvantages. Because the treatment may differ from person to person, the presence of a single definitive treatment it is impossible to talk about.

Definitions about cancer extend to ancient times. Cancer is a disease in which human beings have struggled since their early days. However, in the medical records starting from the 18th century and including the first half of the 20th century, the incidence of cancer increased with urbanization (10) .

The characteristics and habits of individuals regarding their way of life are very important in the formation and development of cancer. Incorrect eating habits, inadequate physical activity and sedentary lifestyle, smoking and alcohol use, intense exposure to sunlight, and stress are the main factors that cause cancer. Controllable factors related to lifestyle that plays a role in the formation of most cancers cause 80-90 % of cancer formation. Factors related to nutrition cause an average of 35% of these factors and 30 % of smoking habits (11) .

While the role of aging in tumor development is not fully understood, age is also a risk factor for cancer and the average age of cancer is 65 years (12) .

Some occupations are exposed to toxic chemical substances and therefore are at high risk for cancer (13) .

There are more than 200 types of cancer in the world (13) . According to the incidence of major cancer types; lung cancer, breast cancer, colon cancer, prostate cancer, stomach cancer, liver cancer, cervical cancer and esophageal cancer (14) . Besides these, skin cancers, bone and soft tissue cancers, lymphomas are also important cancer types (15).

2.2. Malnutrition

Malnutrition is the inadequate intake of one or more nutrients needed for the body to disrupt the body's balance. It's a clinical condition that needs follow-up (16) . This results in body mass loss and organ-system dysfunction. There is currently no accepted international standard for the diagnosis of malnutrition. Nutritional scores are used; Subjective Global Assessment (SGA) , Nutrition Risk Index (NRI), Mini Nutritional Assessment (MNA) , Malnutrition Universal Browsing Tool (MUST) and Nutrition The Risk Score (NRS-2002) is the most widely accepted. Malnutrition causes; Inadequate nutrient uptake, increased nutrient requirements, malabsorption, malign diseases, infections, metabolic disorders can be classified (17) . Malnutrition in cancer patients destroys the immune response, delays wound healing, causes severe infections to develop, and reduces patient tolerance to side effects of applied treatments (18) .

Malnutrition is seen in 20% to 50% of hospitalized patients, which differs according to the method of diagnosis and the type of disease causing the malnutrition (19) . In the case of old age, this rate increases due to changes in body composition (such as loss of skeletal muscle mass) and decreased appetite (20) (21) (22) .

After nutritional risk is detected due to deteriorating nutrient intake or body weight loss, the presence and severity of inflammation can be assessed to determine whether the malnutrition is caused by starvation (such as chronic starvation, anorexia nervosa) or chronic (organ failure, rheumatoid arthritis etc.) or acute disease, burns, head trauma, etc.) can be obtained (23) .

Inflammation makes the response to nutritional intervention difficult and leads to malnutrition risk and mortality is at the top of the factors that increase risk (23) . C-reactive protein (CRP) and albumin levels are frequently used in evaluating inflammatory activity in the malnutrition (24) . These two methods of assessment provide information on life span, mortality, or whether there are additional diseases in the patient (25) (26) .

Nutritional problems are usually not recognized early. However, this finding is vital for the patient's treatment process, comorbidities, length of stay in hospital and quality of life. Malnutrition is highly prevalent in hospitalized patients and is one of the major risk factors for morbidity and mortality (27) .

2.3. Malnutrition and Cancer

Malnutrition is a common condition in cancer patients. The severity of the malnutrition varies depending on the type, location and condition of the cancer (28) . Cancer is associated with protein-energy malnutrition that can lead to be cachexia. Cancer cachexia; "A multi-factor syndrome in which loss of skeletal muscle mass (with or without loss of fat mass) is not fully reversible with normal nutritional support". It leads to progressive functional deterioration.

Cachexia in cancer can also be called a syndrome in which tumor agents cause direct tumor formation and the abnormal response of the host indirectly causes fat and muscle loss (29) (30) .

Descending anorexia-related reduced food intake, defined as uncontrolled loss of appetite, accelerates the formation of cachexia by making it difficult to meet the need with increased metabolic rate of rest in the cancer (31) (32) . Especially in patients with lung and pancreatic cancer, systemic inflammation increases the baseline energy expenditure of patients. However, as the physical activity of the patients decreases, the total energy expenditure is thought to have not changed (33) .

In the pathogenesis of cancer cachexia, tumor growth is reported to be responsible for most of the symptoms, including anorexia (34) .

Pathophysiology; characterized by a negative protein and energy balance due to reduced nutrient intake and abnormal metabolism (35) . Depending on the local and systemic effects of the tumors and side effects of the treatments, cancer patients develop malnutrition at various levels (36) . It is known that the nutritional status changes according to the anatomical location of the cancer. The loss of body weight of a cancer patient also depends on other factors such as cancer aggressiveness (progressive and histological characteristics), therapies (radiotherapy, chemotherapy, and surgery), age and accompanying factors like depression (37) .

In the pathogenesis of cancer cachexia, it has been reported that inflammation caused by tumor growth is responsible for most of the symptoms including anorexia (34) . Complex interaction between the cachexia proinflammatory cytokines and host metabolism occurs. There are three basic mediators responsible for the inflammatory response: cytokines, free oxygen radicals (SR) and eicosanoids (38) (39) . Cancer-induced cachexia, excessive weight

loss, anorexia, asthenia and anemia can be observed. In addition, changes in carbohydrate (CHO) , fat and protein metabolism are observed.

2.3.1. **CHO Metabolism:** In the cachexia, Cori cycle, the conversion of lactate to glucose is accelerated. As a result, glucose intolerance and insulin resistance are observed.

Abnormal insulin secretion, increased glucose production and turnover are accompanied by these. Corticol and glucagon levels were also increased in patients with cachectic cancer (40) (41) .

2.3.2. **Protein Metabolism:** Negative nitrogen and energy balance are observed in cachexia (31) (10). In addition to protein turnover and fractional protein synthesis rate, hepatic protein synthesis is increased while muscle functional protein synthesis rate is decreasing (42) . Even in patients with the same rate of protein destruction as the control group, net protein degradation can be observed due to the slowing of protein synthesis (40).

2.3.3. Fat Metabolism: Catabolism in muscle proteins and diminished chunking of branched-chain amino acids lead to excessive amounts of fat breakdown due to protein loss in fat metabolism. Lipolysis, free fatty acids, glycerol conversion increased. Lipogenesis and hyperlipidemia are reduced. Glucose fails to suppress the oxidation of free fatty acids. The increase in metabolic rate of resting sash is increasing the oxidation of fats (38) (42) . Hypertriglyceridemia is also observed in cachexia (43) .

Anorexia-cachexia syndrome is seen in 30-80 % of patients with cancer (29)(31) (44) . This ratio varies according to the severity of the cachexia, and patients with severe cachexia who have lost more than 10% of their weight constitute 15 % of the slice (29) . Anorexia is frequently observed in 40-50 % of cases in diagnosis and 50-70 % in progression. 20 % of deaths due to cancer are due to malnutrition and cachexia (31) (33) (39) (40) (45).

Nutritional habits are also important in the progression and treatment of cancers. Nourishing the developing age also increases the prevalence of cancer-induced malnutrition. Elderly status is a malnutrition factor and the incidence of cancer cachexia is higher in old age (12) (46) .

According to the literature, the malnutrition rates of cancer patients can range between 15 and 80% (47) (48) . Malnutrition is a common finding in cancer patients. Malnutrition becomes more evident with tumor growth and spread. However, the

mechanisms by which they are sustained often arise early in the history of cancer. For malnutrition, these mechanisms can involve primary tumor or damage by specific treatment such as anticancer therapies (surgery, chemotherapy, radiotherapy) also in cancers that usually are not directly responsible for nutritional and metabolic status alterations (i.e. bone tumors) (49) .

In a study published in 2018, malnutrition after gastrectomy was significantly associated with poor specific survival. The importance of preoperative nutritional support for reducing postoperative malnutrition in the study was emphasized (50) .

In another study conducted in 2018, 64.3 % of malnutrition was seen in patients with colon cancer, pancreas, esophagus, and liver, gall bladder in a study evaluating the feeding of 104 cancer patients. 64.6 % malnutrition was found in lung, neck, breast and other cancer patients (51) .

Zhang et al. During the study, mini-nutritional assessment (MNA) tests were performed during the hospital admission of 103 patients with lung cancer over 60 years of age. While 56.3 % of the patients were in adequate nutrition, 12.6 % were in malnutrition and 31.1 % were malnutrition-risk (52) .

Nutrition and Dietetics Academy and the American Parenteral and Enteral Nutrition Society (Academy / ASPEN) conducted a study of 19 individuals after completing chemotherapy was followed for 3 months. Multi-frequency bioelectrical impedance analysis, nutrition-focused physical examination, anthropometry, diet intake and hand grip power were collected. 67 % were found to be malnourished after treatment initiation (53) .

In a study published in 2006, 207 cancer patients were evaluated before and after radiotherapy. Malnutrition was seen in 26 % of the patients who applied to radiotherapy. The rate of malnutrition after radiotherapy was 43 %. By a 6-month follow-up, the ratio of patients with malnutrition decreased to 8 %. This prospective study suggests that malnutrition is a significant problem in cancer patients receiving RT and is evidence of early evaluation of key nutritional support in undernourished patients (54) .

Between 2013 and 2014, a retrospective study was conducted in Hong Kong to determine nutritional status before and after head and neck cancer surgery in a health center. A higher preoperative albumin level was associated with lower postoperative complication rates and better wound healing. On the contrary, preoperative body mass index, hemoglobin

level and absolute lymphocyte count did not show any significant correlation with postoperative results. The patient's high albumin levels were associated with better surgical outcomes, and procedures should be performed to increase albumin levels prior to surgery (55) .

In the study performed on 388 patients, malnutrition status was evaluated in postoperative surgical patients. The rate of malnutrition is 15.98 % . It has been observed that the head and neck surgery increased the rate of malnutrition. As a matter of fact, the individuals who applied for head and neck surgery were already inadequate at the time of application (56) .

338 chemotherapy patients over 70 years of age who were malnourished according to MNA for 2 years were searched. For patients were targeted at 30 kcal / kg and 1.2 gr protein / kg / day. The most frequent type of cancer was colon (22.4 %), lymphoma (14.9 %), lung (10.4 %) and pancreas (17.0 %) in both groups. In the second visit, 57 patients (40.4 %) reached the energy target and compared with protein target in 66 (46.8 %) and control (13.5 %) and 20 (20.8 %) controls. No change in nutritional status was found. Chemotherapy response was similar among the groups. As a result, in elderly patients at risk for malnutrition during chemotherapy treatment, individual dietary counseling caused an increase in dietary intake but did not reduce mortality (57) .

Prospectively, nutritional research was conducted on 628 people with colon cancer between 2000 and 2009. Group 1 received nutritional support. Group 2 did not receive reinforcements. When chemotherapy was finished, all patients were evaluated. Those who did not receive nutritional supplements had a BMI < 20 and weight loss. Additional nutrition provided delayed weight loss. Patients with early nutritional support were 19.1 months old while patients in the control group survived 12.4 months (58) .

In another study, a prospective study of patients after esophageal and gastric cancer surgery was performed. Fecal elastase, albumin, vitamins and micronutrients were measured before and after surgery at the 1st, 6th and 18th months. Total body fat mass (84 ± 71 versus 84 ± 71, P <0.001) and skeletal index (44 ± 8 versus 39 ± 8, P = 0.007) decreased significantly between 18-24 months. Malnutrition spreads from esophagus and stomach cancer survivors (59) .

This prospective, multicenter, 1-day study conducted in 17 Comprehensive Cancer Centers in France included 1545 patients. Malnutrition was detected in 30.9 % of the patients and the grade of malnutrition was seriously evaluated in 12.2%.According to the analysis, cancers of the head and neck or upper digestive system were associated with increased risk of malnutrition. At the French Comprehensive Cancer Centers, one of three cancer patients was found to be malnutrition (60) .

A group of experts came together under the auspices of the European Oncology School and based on limited evidence, they created malnutrition and oncology recommendations. The conclusion is that oncologists should provide adequate energy and protein intake in cancer patients, preserve physical activity to preserve muscle mass, and reduce systemic inflammation (if any) (61) .

In a prospective study conducted at Marmara University, 14 cancer patients who received chemotherapy or radiotherapy despite good care and close follow-ups were observed to have poor nutritional parameters (62) .

The effect of chemotherapy on malnutrition was investigated on 153 cancer patients. Cancer population distribution was colorectal (51.6 %) , gastric (26.8 %) , pancreatic (11.8 %) , liver (7.2 %) , biliary tract (2 %) and esophageal (0.7 %) . It was reported that 37.9 % of the patients were inadequate, 34.6 % were malnourished and 27.5 % were well fed. It was observed that the incidence of malnutrition after chemotherapy treatment increased to 46.4 % (63) .

2.4. Assesment of Nutritional Status

2.4.1. Malnutrition Screening Tools

In patients admitted to the hospital, malnutrition is highly prevalent (20-50 %) and duration of hospital stay (approximately 1.2-1.7 times) , and increased morbidity and mortality (19) (64) (65) . Despite this prevalence, it has been reported that the assessment of nutritional status of nearly 70 % of patients is inadequate (66) . For this reason, practical nutritional screening tools have been developed in order to evaluate patients' nutritional status and their susceptibility to malnutrition (26) . Since screening of patients' nutritional status is necessary for good nutritional practice, it is necessary to constantly assess nutritional status when they are hospitalized (67) . Especially in cancer patients, early nutritional screening is vital and all patients should be screened for cancer risk in terms of risk of malnutrition (46) (68).

Among the main objectives of nutrition screening are; reducing mental and physical dysfunctions, minimizing the complications that may occur in the treatment of the disease, accelerating the healing process and reducing the length of stay and cost in the hospital (69) .

In recent years, the use of easy screening and evaluation tools developed in hospitals has become increasingly widespread. Some of these are more commonly used in certain countries [Malnutrition Screening Tool (MST) in Australia and New Zealand, and Short Nutritional Assessment Questionnaire (SNAQ) in the Netherlands].Others are recommended by the European Association for Enteral and Parenteral Nutrition (ESPEN) , such as the [MUST] , Nutritional Risk Screening (NRS-2002) , Mini-Nutritional Assessment Questionnaire (MNA) . There is no consensus on what the best screening tool is. Since there is no gold standard for malnutrition, screening tools are validated by referencing each other (70) .

2.4.2. Food Records

To investigate the relation between diet and chronic disease, several dietary assessment methods have been developed and evaluated.

The reminder method for daily food intake, which is applied as a 24-hour recall, is based on a detailed recall of food and beverages consumed in a certain period of time in the past. Generally, the base time interval is the previous 24 hours.

The frequency of food consumption and consumption of food or food groups is determined by daily, weekly or monthly frequency and quantity. When used in conjunction with the food consumption frequency, 24-hour food consumption, it gives accurate information about the correctness of the information and food consumption. The food frequency questionnaire (FFQ) has been used most frequently in large-scale epidemiologic studies, because FFQ is less expensive to administer than are other dietary assessment methods.

Food records ask participants to record all foods and beverages consumed over a specific period of time, usually 3 to 7 days or during multiple periods within a year. Because food records do not rely on memory, food records have been used as a reference method to validate other dietary assessment methods. Food records have revealed relationships not observed in the FFQ. A significant relationship between dietary fat and the risk of breast cancer was found based on multiple-day food records, but was not seen in the FFQ. However, multiple-day food records require highly motivated participants, and they are expensive to administer in large samples, thus 3-day food records have been commonly used in practical settings (71) (72) (73) .

2.4.3. Laboratory Results

Biochemical tests can be used to assess nutritional status in patients by determining the levels of nutrients in blood and urine. The amount of serum protein indicates albumin, transferrin, prealbumin and retinol binding protein (RBP) . In the evaluation of malnutrition, the transport proteins listed above are helpful. Albumin level is often used in the diagnosis and follow-up of chronic malnutrition. If serum albumin levels are low in the absence of stress hypoalbuminemic malnutrition or kwashiorkor should be considered as a diagnosis in these patients. In order for these measurements to be accurate, the patient must be normovolemic and have not received blood products or albumin. Serum albumin levels decrease with age. Hemoglobin, hematocrit, serum ferritin, iron, transferrin saturation, folic acid, B12 and B6 vitamins determine nutritional status in terms of anemia (74) .

In patients with advanced gastrointestinal cancer, 119 patients were studied to observe the effect of weight loss, appetite, and inflammatory response on quality of life. Serum C-reactive protein (CRP) and albumin levels of patients were examined. CRP levels were found to be higher in the group with loss of weight (75) .

2.5. The High Prevalence of Cancer

In the world, 10 million new cases of cancer in 2000, 6 million of cancer death and totally there are 22 million patients with cancer. The most common cancers are lung (1.2 million people) , breast (1.05 million people) , colorectal (945,000 people) and liver cancer (564,000 people) . Cancer is the 4th most common cause of death in the Turkey in the 1970s, but has risen to the 2nd place after cardiovascular diseases in recent years (76). According to GLOBOCAN 2012 data, a total of 14.1 million new cancer cases were developed in the world in 2012 and there were 8.2 million cancer-related deaths. The most diagnosed cancers in the world were lung (13,0 %) , breast (11,9 %) and colon (9,7 %) while cancer deaths were mostly lung (19,4 %) , liver (9,1 %) and stomach (8,8 %) (77) .

According to 2009 statistics, cancer every year in Turkey is about 98 thousand men and 63 thousand women diagnosed with cancer.

Cancer is the major cause of morbidity and mortality as the second most common cause of death in the world. Turkey incidence of cancer in the world shows similarities with the developing countries of the world (Table 2.1.) (78) .

Table 2.1. IARC, according to 2012 data published by Globocan situation in Turkey (except skin cancer by the age standardized rates / 100 000 persons) (78) .

	Male*	**Female***
World	205.4	165.3
IARC'a members 24 countries	236.4	192.5
EU (28 countries)	314.9	243.2
USA	347	297.4
Turkey**	**245.7**	**157.5**

*That has been standardized by age rate per 100,000 people ** Turkey United Database, 2009

2.6 .Treatments of Oncology Diseases

Treatment methods commonly used in cancer are surgery, radiotherapy and chemotherapy. Less frequently, hormone treatments, biological treatment methods and targeted therapies are used. In the treatment of cancer, chemotherapy is the process of killing cancer cells with drugs (cytotoxic) . A single chemotherapy drug or a combination of different chemotherapy drugs can be taken. There are more than 100 different drugs currently available and new drugs are constantly being developed. Chemotherapy is a type of cancer drug and can be taken with other types of cancer drugs, such as biological therapies. Radiotherapy means the use of radiation, usually X-rays, to treat the disease. X-rays were discovered in 1895 and are being used for treatment (radiotherapy) (79) .Surgery is one of the cancer treatment options. Surgery means removing tissue from the body. It's one of the main treatments for many types of cancer. Surgery in cancer treatment depends on some conditions: The type of cancer, the size and extent of the cancer, the location of the body and the general health of the patient (80) .

3. MATERIALS AND METHODS

3.1. Subjects

A total of 104 volunteers aged 27-86 years (58 surgical procedures cancer cases and 46 non-surgical cancer cases) treated at Koç University Hospital between November 2017 and February 2018 were included in the study. 58 patients were male and 46 were female. Exclusion criteria are patients receiving intensive care patients and neuromuscular disorders, hemiplegia, tube feeding (nasogastric, percutaneous endoscopic gastrostomy) and parenteral nutrition support. Cancer patients with metastases were also not included in the study.

For the study, ethics committee number 2017.135.IRB2.046 was obtained from the Koç University Biomedical Research Ethics Committee (Annex 1) .

3.2. Data collection

General information has been given to the patients in accordance with the working conditions. Individuals who are willing to participate have been declared by the "Informed Consent Form" (Annex 2) that they have accepted it in volunteering. The patients are told that they can be separated if they want to leave without working during the study period.

The general characteristics (age, sex, etc.) of each patient, comorbidities, oral nutritional supplement information were obtained by interviewing patients face to face. The information about cancer type, stage, duration, treatment, laboratory results of each patient was obtained from the computer program which was used by the hospital information. Data collection, anthropometric measurements and food consumption records were made by the researcher dietician (Annex 3) .

Body Weight: All individuals' body weights are measured with a hand-held bath scale sensitive to 0,100 g and care has been taken to ensure that the person is wearing thin clothing.

Height: Height of the individuals, their feet are side by side; head, buttocks, foot heels are measured with a tape measure that will touch the wall.

Body Mass Index (BMI) : The body weight is calculated by dividing the height of the body by the height of the body [body weight (kg) / height (m) ²].

Hip perimeter: Measured at the same position by detecting the maximum circumference of the individual side. Attention has been paid to the fact that people are wearing thin clothes during the measurement (81) .

Upper Middle Arm Circumference: The arm is bent 90^0 at the elbow. The shoulder is measured between the acromial overhang and the elbow with the olecranon overhang. The obtained value is divided into two, the middle point is located and the circumference of the middle part is measured. During upper middle arm measurement, the researcher has direct contact with the arm, and the arm is naked (82) .

3.3. Evaluation of Nutritional Status

The research form given in Annex 4 was filled by face-to-face interview technique by the researcher.

The Mini Nutritional Assessment was used for the nutritional status assessment. The Mini Nutritional Assessment (MNA) , which is preferred in this study, is an easy and clinically feasible method for evaluating malnourished patients. The oncology patients in the study were given a Mini Nutritional Assessment (MNA) consisting of a screening phase and an evaluation phase. The MNA contains 18 items collected in 4 sections. These four sections are; anthropometric evaluation (BMI, weight, arm and calf surroundings);general evaluation (lifestyle, drug, mobility, depression and dementia indications);short nutritional evaluation (number of meals, intake of food and fluid, autonomy to nutrition) and subjective assessment (self-perception of health and nutrition) (83).After the MNA is completed, the final score is specified as a maximum of 30 points. MNA patients are classified as normally fed ($\geq$ 24), at risk (between 17- 23.5) or as marked malnutrition (<17) (84) .

Together with screening methods, the patient's story is taken. After the anthropometric measurements are made, the biochemical parameters are checked through the hospital system and the nutritional status of the patients is determined. For example, studies have shown that low albumin levels in patients with gastrointestinal system cancer are seen only during hospitalization, and low body mass index is a risk of death for cancer patients after surgery (85) (86) .

3.4. Food Consumption

Food consumption frequency (FFQ) is the most commonly and easy used method in large-scale epidemiological studies. However, many studies have suggested that other types of dietary assessment may be used to come up to the limitations of FFQs in epidemiological studies of diet and illness. Among these limitations, FFQ relies weakly on biomarkers and

lack of consistency in studies. In epidemiological studies, FFQs are inadequate (71) (87) (88) (89) .

A significant relationship between consumed fat and breast cancer risk was found in the daily food consumption records, but not in FFQ (72) (73). 3 days of food consumption is preferred because it is used more practically (90). Nutritional Information System (BeBis) computer package program was used to evaluate consumed nutrients in terms of energy and nutrients (91) . In the assessment of the adequacy status, recommended daily dietary allowances (RDA) and energy data were used for this age group.

Percentage coverage of energy and food items is calculated (92) . There is a sample of the 3-day food consumption form used (Appendix 4) .

3.5. Laboratory Results

Biochemical tests can be used to assess nutritional status in patients by determining the levels of nutrients in blood and urine. Albumin level is frequently used in the diagnosis and follow-up of chronic malnutrition. In order for these measurements to be accurate, the patient must be normovolemic and have not received blood products or albumin. Serum albumin levels decrease with age. Serum albumin level is 47.5 g / L on average at 20-40 years of age, while it drops to 41.8 g / L between 60-74 years (81) .

Albumin and creatinine levels of all patients participating in the study were examined at Koç University Hospital Biochemistry Laboratory.

Reference values for blood findings are given in Annex 5 .

3.6. Statistical Analyzes

Statistical analyzes were performed using the SPSS (IBM SPSS Statistics 24) package program. Frequency tables and descriptive statistics were used to interpret the results.

Parametric methods are used for the appropriate measurement values for normal distribution. "Independent Sample-t" test (t-table value) method was used to compare two independent groups with the measured values in accordance with the parametric methods.

Non-parametric methods are used for measurement values that are not normally distributed. The "Mann-Whitney U" test (Z-table value) method was used to compare the two independent groups with the measured values, in accordance with the nonparametric methods.

" χ^2 -cross tables" were used according to the expected value levels when the relations between the two qualitative variables were examined.

4. RESULTS

Table 4.1. Distribution of findings related to the disease

Variable (N=30)	n	%
Surgical Status		
Non-surgical oncology patients	46	44,2
Surgical oncology patients	58	55,8
Gender		
Female	46	44,2
Male	58	55,8
Age [$\overline{X} \pm S.S. \rightarrow 62{,}93 \pm 13{,}03\ (year)$]		
Under 60 years	33	31,7
60-70 years	39	37,5
Over 70 years	32	30,8
MNA Classification		
Malnourished	51	49,0
Under the risk of malnutrition	41	39,4
Well- nourished	12	11,5

46 patients (44.2 %) did not undergo surgery, and 58 patients (55.8 %) underwent surgery. 58 patients (66.7 %) were male. 39 patients (37,5 %) were in the 60-70 age group and the mean age of all patients was 62,93±13,03 (years) . 51 patients (49 %) were found to be at malnourished.

Table 4.2. Examination of the differences according to the surgical situation of the diseases

Variable (N=30)	**Surgery Status**		**Statistical Analysis* Possibility**
	Non-surgical (n=46)	**Surgical(n=58)**	
Gender			
Female	20 (%43,5)	26 (%44,8)	χ^2=0,019
Male	26 (%56,5)	32 (%55,2)	p=0,891
Age	67,0 [38,0-86,0]	62,0 [27,0-85,0]	Z=-2,168 **p=0,030**
MNA (score)	14,8 [3,5-24,0]	18,5 [7,0-28,5]	Z=-4,720 **p=0,000**

*** "X2-cross tables" were used according to the expected value levels when the relations of two qualitative variables were examined. The "Independent sample-t" test (t-table value) statistics were used to compare the two independent groups with normal distribution with the measured values.**

There was no statistically significant relationship between gender and surgical status (p> 0.05) .

There was a statistically significant difference in the age (years) of the patients according to the surgical situation (Z = -2,168; p = 0,030) . The age (years) of patients who did not undergo surgery was found to be statistically significantly higher than those who underwent surgery.

Statistically significant differences were found in terms of MNA (score) values of the patients according to the surgical situation (Z=-4,720; p=0,000) . The MNA (score) value of patients who do not undergo surgery is statistically significantly lower than those who undergo surgery. Patients who do not undergo surgical procedures are malnourished, while patients undergoing surgery are at risk of malnutrition.

Table 4.3. Examination of the biochemical values of the patients according to the surgical situation

Biochemical Values	Surgical Status				Statistical Analysis* Possibility
	Non-Surgical (n=46)		Surgical (n=58)		
	$\bar{X}$±S.D.	M [IQR]	$\bar{X}$±S.D.	M [IQR]	
Albumin	3,17±0,68	3,2 [0,9]	3,44±0,59	3,4 [0,9]	t=-2,100 **p=0,038**
Creatinine	0,89±0,45	0,7 [0,6]	0,73±0,28	0,7 [0,3]	Z=-1,309 p=0,190

*** "Independent sample-t" test (t-table value) when comparing two independent groups with normal distribution with measured values; "Mann-Whitney U" test (Z-table value) statistics were used to compare two independent groups with no normal distribution.**

According to the surgical situation creatinine values was not statistically significant ($p > 0,05$) .

There was a statistically significant difference in the albumin values of the patients according to the surgical situation ($t = -2,100$; $p = 0,038$) . The albumin value of the patients who underwent surgery was statistically significantly higher than those who did not undergo surgery.

Table 4.4. Examination of the nutrition values of the patients according to the surgical situation

Biochemical Values	Surgical Status				Statistical Analysis* Possibility
	Non-Surgical (n=46)		Surgical (n=58)		
	X̄±S.D.	M [IQR]	X̄±S.D.	M [IQR]	
Energy (kcal)	1173,87±634,67	1261,4 [853,6]	1455,85±436,55	1459,1 [228,9]	Z=-2,898 **p=0,004**
Protein (g)	57,87±32,02	70,3 [46,7]	70,36±25,02	72,8 [26,3]	Z=-2,867 **p=0,004**
Fat (g)	49,68±30,27	50,1 [41,8]	59,05±23,64	61,2 [25,0]	Z=-2,124 **p=0,034**
Carbonhydrate(g)	138,86±76,67	147,7 [120,8]	164,03±53,26	162,6 [36,5]	Z=-1,827 p=0,068
Fiber (g)	10,33±7,24	8,9 [12,8]	13,30±6,07	12,8 [6,9]	Z=-2,278 **p=0,023**
Cholesterol(mg)	302,89±240,19	296,7 [466,0]	276,88±184,61	274,0 [340,7]	t=0,333 p=0,742
A Vitamin (mg)	1208,07±1386,13	686,9 [1314,7]	1136,79±680,13	1111,3 [917,5]	Z=-1,118 p=0,264
Carotene	1,22±0,81	1,1 [1,3]	1,71±1,13	1,2 [1,8]	Z=-2,239 **p=0,025**
E Vitamin (mg)	10,10±8,82	8,9 [12,4]	10,62±6,13	10,6 [7,6]	Z=-0,810 p=0,148
B1 Vitamin	0,55±0,54	0,5 [0,6]	0,61±0,36	0,6 [0,3]	Z=-1,778 p=0,075

B2 Vitamin	1,01±0,77	0,9 [1,3]	1,13±0,51	1,1 [0,8]	Z=-1,252 p=0,211
B6 Vitamin	0,94±0,82	1,0 [1,0]	1,10±0,45	1,1 [0,4]	Z=-1,105 p=0,269
C Vitamin	62,45±62,86	43,5 [56,3]	67,58±55,55	50,1 [21,6]	Z=-1,679 p=0,093
Calcium	753,95±465,22	760,6 [516,9]	869,54±391,55	829,1 [209,7]	Z=-1,711 p=0,087
Magnesium	177,62±131,51	183,0 [202,3]	195,74±95,40	193,8 [61,0]	Z=-0,353 p=0,724
Phosphorus	878,45±590,34	903,2 [939,5]	965,07±496,49	962,8 [530,4]	t=-0,435 p=0,667
Iron	7,11±4,49	7,6 [7,6]	7,58±2,89	7,3 [3,3]	t=-0,343 p=0,734
Zinc	8,26±6,34	8,1 [7,8]	7,97±3,38	8,4 [3,3]	t=0,155 p=0,878

*** "Independent sample-t" test (t-table value) when comparing two independent groups with normal distribution with measured values; "Mann-Whitney U" test (Z-table value) statistics were used to compare two independent groups with no normal distribution.**

According to the surgical situation carbohydrate (g) , phosphorus, zinc, vitamins A (mg) , vitamins E , B2, B6, C vitamins, cholesterol, magnesium calcium, and iron values were not statistically significant (p> 0,05) .

Statistically significant differences were found in terms of energy (kcal) values according to the surgical situation (Z = -2,898, p = 0.004) . The energy (kcal) value of the patients who underwent surgery was statistically significantly higher than those who did not undergo surgery.

There was a statistically significant difference in the protein (g) values of the patients according to the surgical situation (Z = -2,867; p = 0.004). Protein (g) values of patients underwent surgery were statistically significantly higher than those without surgery.

There was a statistically significant difference in terms of fat (g) values according to the surgical situation (Z = -2,124, p = 0,034) . The fat (g) value of the patients who underwent surgery was statistically higher than those who did not undergo surgery.

There was a statistically significant difference in the fiber (g) values of the patients according to the surgical situation (Z = -2,278, p = 0.023) . The fiber (g) value of the patients who underwent surgery was statistically significantly higher than those who did not undergo surgery.

There was a statistically significant difference in the carotene values of the patients according to the surgical situation (Z = -2,239, p = 0,025) . The carotene values of the patients who underwent surgery were significantly higher than those who did not undergo surgery.

Table 4.5. Examination of the nutrition values of the disease according to the surgical situation in terms of DRI

DRI (Qualification Percentages)	**Surgical Status**				**Statistical Analysis* Possibility**
	Non-Surgical (n=46)		**Surgical (n=58)**		
	$\bar{X}$±S.D.	**M [IQR]**	**$\bar{X}$±S.D.**	**M [IQR]**	
Energy	60,38±32,82	65,0 [50,3]	75,34±23,79	75,0 [11,8]	Z=-3,064 **p=0,002**
Protein	101,28±56,23	123,0 [86,8]	123,09±44,39	127,0 [47,3]	Z=-2,739 **p=0,006**
Fat	75,70±46,27	76,5 [64,0]	90,02±35,99	93,2 [37,5]	Z=-2,124 **p=0,034**
Carbonhydrate	50,30±27,33	54,0 [44,0]	59,54±19,16	59,0 [13,0]	Z=-1,879 p=0,060
Fiber	38,60±27,05	38,0 [42,0]	47,27±18,20	47,0 [19,0]	Z=-2,033 **p=0,042**
Cholesterol	108,08±75,23	108,1 [140,0]	92,20±61,60	91,0 [114,0]	t=0,633 p=0,532
A Vitamin	138,78±165,89	76,0 [137,0]	149,45±91,35	133,0 [113,5]	Z=-0,823 p=0,411
E Vitamin	82,01±73,54	62,5 [85,5]	94,57±56,47	100,0 [93,3]	Z=-1,961 **p=0,049**
B1 Vitamin	47,07±45,12	39,0 [55,3]	51,51±30,13	51,0 [22,0]	Z=-1,696 p=0,090
B2 Vitamin	82,00±63,23	67,0 [123,0]	91,72±42,87	87,0 [63,3]	Z=-1,299 p=0,194
B6 Vitamin	58,35±49,32	58,0 [75,0]	69,47±34,64	65,0 [21,0]	Z=-0,809 p=0,418

C Vitamin	73,66±71,57	56,0 [80,0]	78,18±61,45	58,0 [25,5]	Z=-1,626 p=0,104
Calsium	64,13±39,53	63,0 [47,4]	73,73±34,97	69,0 [18,2]	Z=-1,770 p=0,077
Magnesium	46,06±32,85	44,0 [54,0]	49,53±21,98	48,0 [13,0]	Z=-0,394 p=0,693
Phosphorus	125,30±84,34	129,0 [134,0]	137,87±70,83	138,0 [76,0]	t=-0,442 p=0,662
Iron	83,48±55,81	89,2 [85,0]	94,80±36,22	91,0 [40,0]	t=-0,659 p=0,515
Zinc	82,37±58,71	73,0 [89,0]	79,20±35,32	77,0 [29,0]	t=0,179 p=0,859

*** "Independent sample-t" test (t-table value) when comparing two independent groups with normal distribution with measured values; "Mann-Whitney U" test (Z-table value) statistics were used to compare two independent groups with no normal distribution.**

There was no statistically significant difference in terms of DRI values of carbohydrate, cholesterol, phosphorus, zinc, vitamin A, vitamins B1, B2, B6, C vitamins, magnesium, calcium and iron according to the surgical condition ($p > 0.05$) .

Statistically significant differences were found in terms of energy (DRI) values of the patients according to the surgical situation ($Z = -3,064$, $p = 0,002$) . The energy (DRI) value of the patients undergoing surgery is statistically significantly higher than those without surgery.

Statistically significant differences were found in terms of protein (DRI) values of patients according to surgical status ($Z = -2,739$, $p = 0,006$) . Protein (DRI) values of patients undergoing surgery were statistically significantly higher than those without surgery.

There was a statistically significant difference in terms of fat (DRI) values of the patients according to the surgical situation ($Z = -2,214$, $p = 0,034$) . The fat (DRI) value of patients undergoing surgery was statistically significantly higher than those without surgery.

Statistically significant differences were found in terms of fiber (DRI) values according to the surgical situation (Z = -2,033, p = 0.042). The value of fiber (DRI) of the patients who underwent surgery was statistically higher than those who did not undergo surgery.

There was a statistically significant difference in the vitamin E (DRI) values of the patients according to the surgical situation (Z = -1.961, p = 0.049). The vitamin E (DRI) value of the patients who underwent surgery was statistically significantly higher than those who did not undergo surgery.

5. DISCUSSION and CONCLUSION

Cancer-related deaths have risen to the second place after deaths due to cardiovascular diseases. Cancer causes morbidity and mortality and therefore presents a serious problem (93) . Cancer may vary according to the type, age, sex, and geographical area of the cancer. The rate of incidence varies from 85 to 350 per hundred in the society (94). It is estimated that the number of cancers will increase in the coming years due to the increase in the proportion of elderly population and therefore cancer-related morbidity and mortality will continue to increase progressively (95) .

The age range in which the diagnoses are most visible in those participating

in the study is the age range of 60-70 years. In a similar study conducted in Turkey, 34 of the 42 gastric cancer patients, 60 of 69 colon cancer patients, 6 of the 10 patients with pancreatic cancer is the age group of up to 50 years of age and older (96) .

Leandro-Merhi et al. the average age of cancer patients is 57.7 ± 13.8 years. 62% of patients are under 60 years old, 38% are over 60 years old (97).

This study was conducted with 104 oncology patients in Koç University Hospital. 46 patients (44.2 %) were nonsurgical and 58 patients (55.8 %) were surgical. 58 patients (66.7 %) were male. 39 patients (37,5 %) were in the 60-70 age group and the mean age of all patients was 62,93±13,03 (years). 51 patients (49 %) were found to be at malnourished (Table 4.1) .

These results show that cancer diagnosis is more common with later age. This state of association with later aging can be related to changing nutritional conditions and habits, physical activity habits, environmental factors and genetic background.

Patrick J. Offer et al. There was no statistically significant relationship between gender and surgical status in the study titled 'Male Gender Is a Rısk Factor for Major Infections After Surgery' (p> 0, 05) . There was no statistically significant difference in terms of age according to the surgical situation (p> 0, 05) (98) .

There was no statistically significant relationship between gender and surgical status (p> 0.05).

There was a statistically significant difference in the age (years) of the patients according to the surgical situation (Z = -2,168; p = 0,030) . The age (years) of patients who did not undergo surgery was found to be statistically significantly higher than those who underwent surgery (Table 4.2.) .

A study conducted in 2018, 64.3% of malnutrition was seen in patients with colon cancer, pancreas, esophagus, and liver, gall bladder in a study evaluating the feeding of 104 cancer patients. 64.6 % malnutrition was found in lung, neck, breast and other cancer patients (51) .

In the study performed on 388 patients, malnutrition status was evaluated in postoperative surgical patients. The rate of malnutrition is 15.98 % (62) .

In a study published in 2006, 207 cancer patients were evaluated before and after radiotherapy. Malnutrition was seen in 26 % of the patients who applied to radiotherapy. The rate of malnutrition after radiotherapy was 43 %. By a 6-month follow-up, the ratio of patients with malnutrition decreased to 8%. This prospective study suggests that malnutrition is a significant problem in cancer patients receiving RT and is evidence of early evaluation of key nutritional support in undernourished patients (54) .

The effect of chemotherapy on malnutrition was investigated on 153 cancer patients. It was reported that 37.9% of the patients were inadequate, 34.6% were malnourished and 27.5% were well fed. It was observed that the incidence of malnutrition after chemotherapy treatment increased to 46.4% (69) .

In this study, 41 patients (39,4 %) were found to be at risk of malnutrition. 51 patients (49 %) were found to be malnourished and only 12 patients (11.5 %) were found to be normal status. Malnutrition and malnutrition risk were observed in 88.5 % of cancer patients in the study (Table 4.1.) .

Statistically significant differences were found in terms of MNA (score) values of the patients according to the surgical situation (Z=-4,720; p=0,000) . The MNA (score) value of patients who do not undergo surgery is statistically significantly lower than those who undergo surgery. Patients who do not undergo surgical procedures are malnourished, while patients undergoing surgery are at risk of malnutrition (Table 4.2.) .

The hospitalized cancer patients were hospitalized for chemotherapy or radiotherapy if they had not undergone surgery. There were no patients in this study who did not receive cancer treatment.

In the study conducted in 2012, the Subjective Global Assessment was used to assess nutritional status in the admission of 818 adults. Malnourished patients (29 %) were in the longer hospitalization (6.9 ± 7.3 days, 4.6 ± 5.6 days, p <0.001) (99) .

Patients who received chemotherapy and radiotherapy were considered to have an increased risk of malnutrition because of the length of hospital stay.

In a study conducted in 2006, a total of 117 cancer patients were evaluated using anxiety and depression scale. The majority of patients were receiving chemotherapy for solid tumors. The mean distress score was 24, 18 (15.38 %) anxiety and 19 (16.23%) depression. The study may have a high likelihood of overlapping with anxiety, the high psychological morbidity of the cancer patients and the development of troubles (100).

According to Cancer Research UK, it is common to feel very tired and sad during radiotherapy. Or you may feel worried and depressed during treatment. Many people who see radiotherapy share these feelings (101).

Patients receiving chemotherapy and radiotherapy may experience neuropsychological problems or unhappiness due to long-term hospitalization. Giving low scores to subjective questions such as "Self-View of the Nutrition Status" and "In comparison with other people of the same age, how does the patient consider his / her health status?" influenced MNA results.

Chemotherapy-induced changes in taste are common in patients. The rate of change in taste is different (102). Bernhardson et al. (n = 518) patients who were treated with chemotherapy by patients with different cancers, the rate of non-tastes was 67 % (103).

Study on 184 chemotherapy patients There was a significant difference in terms of "decrease in intake of basic tastes" between chemotherapy treatment and non-cancer patients (p <0,05).There was a significant difference in the mean scores of "discomfort" and "general taste change" subscales (p <0,05) between those with and without mouth sores (104).

According to the American Cancer Society, after surgery, patients may not have a normal diet due to surgery-related side effects. The ability of the body to use nutrients can

also be altered by surgery involving any part of the digestive system (mouth, food tube, stomach, small intestine, pancreas, colon or rectum) (105).

In this study, non-surgical patients were malnourished according to MNA and surgical patients were at risk of malnutrition. This may be due to loss of appetite due to deterioration of taste of non-surgical patients due to chemotherapy and radiotherapy. According to the American Cancer Society, the body's ability to use nutrients can be altered by surgery involving any part of the digestive system. The results may have changed according to the surgical area of 58 patients who underwent surgery.

Biochemical tests can be used to assess nutritional status in patients by determining the levels of nutrients in blood and urine. Accuracy and precision depend on the method used. The amount of serum protein indicates albumin, transferrin, pre-albumin and retinol binding protein (RBP). In the evaluation of malnutrition, the transport proteins listed above are helpful. Albumin and total protein levels are frequently used in the diagnosis and follow-up of chronic malnutrition (74).

The distribution of the biochemical data of the individuals participating in the study according to the reference values of the hospital in which the study was conducted is given in Table 4.3. According to the surgical situation creatinine values was not statistically significant ($p > 0,05$). There was a statistically significant difference in the albumin values of the patients according to the surgical situation ($t = -2,100$; $p = 0,038$). The albumin value of the patients who underwent surgery was statistically significantly higher than those who did not undergo surgery.

Wu et al. (106) albumin values in the study; nutritional status was measured as 3.5 g / dl in normal subjects and 3.1-3.4 g / dl in those with mildly malnutrition, 2.6-3.0 g / dl in those with moderate malnutrition, and 2.5 g / dl and below in those with severe malnutrition. Ryu et al. (107) The albumin level of the well-fed patients was 3.86 ± 0.3 g / dL. The albumin level of the patients with malnutrition was 3.85 ± 0.3 g / dL. It is also possible to see the negative change in biochemical data that worsens the nutritional status of cancer patients. The low levels of albumin may be due to the destruction created by cancerous tissue. Metastasis in the liver, especially where the proteins are synthesized and destroyed, changes the albumin level (108). The half-life of the albumin is 14-20 days and it is insufficient for

so long to determine acute changes in nutritional status. Therefore, low albumin may be a chronic nutritional failure.

In the study of factors affecting mortality in elderly patients, 297 patients aged 65 years and over were included in the study and pre and post-operative information about the disease was recorded. In one-way analysis, nutritional status, albumin level, creatinine level, hemoglobin level, and complication were found to be associated with mortality. In multidimensional analysis, only nutritional status, albumin level and creatinine level were found to be related to mortality (109). Serum blood urea nitrogen, creatinine, total protein, albumin, and alkaline phosphatase levels of 24 cancer patients were measured. There was a significant decrease in albumin levels ($p < 0.001$) and a significant increase in creatinine levels ($p < 0.05$) (110). In non-surgical cancer patients, creatinine level was found to be 1, 03±0, 62, while in surgical cancer patients this value was found to be 0,73±0,30. Creatinine values were not statistically different between the surgical conditions ($p = 0.280$).

In 2003, a study was conducted in which the antioxidant chemotherapy effect was monitored. Patient 1 started oral high dose antioxidant treatment during his treatment. This consisted of oral vitamin C, vitamin E, beta-carotene, coenzyme Q-10 and a multivitamin / mineral complex. Patient 2 was supplemented with oral antioxidants immediately prior to starting chemotherapy, including vitamin C, beta-carotene, vitamin E, coenzyme Q-10 and a multivitamin / mineral complex. As a result of this study, the safety and efficacy of chemotherapy were evaluated as positive when antioxidants were added to a newly diagnosed ovarian cancer at the University of Kansas Medical Center (111). Van Stijn et al. mentions significant decrease in the plasma level of glutamine, cysteine, vitamin C, vitamin E, beta carotene, zinc, and selenium on the first day after surgery in a series of upper gastrointestinal cancer patients (112). In a study of 507 patients (265 colon cancers, 242 rectal cancers) in Japan, rectal cancer was associated with a high concentration of carotene and meat consumption and decreased risk of rectal cancer (113).

In this study, average, minimum, maximum and standard deviation levels of daily energy and nutrient intake obtained by 3-day nutrient consumption records of the individuals were calculated (Table 4.5) and the recommended amounts and coverage percentages were found in RDA (Table 4.5).

Statistically significant differences were found in terms of energy (kcal) values according to the surgical situation (Z = -2,898, p = 0.004). The energy (kcal) value of the patients who underwent surgery was statistically significantly higher than those who did not undergo surgery. Mean energy intake of surgical patients was 1455, 85±436, 55 kcal; non-surgical cancer was 1173, 87±634, 67 kcal, and the acceptance percentages according to RDA were 75, 34±23,79 and 60,38±32,82, respectively.

There was a statistically significant difference in the protein (g) values of the patients according to the surgical situation (Z = -2,867; p = 0.004). Protein (g) values of patients underwent surgery were statistically significantly higher than those without surgery. Mean protein intake of surgical patients was 70, 36± 25, 02 gr; non-surgical cancer was 57, 87±32,02 gr , and the acceptance percentages according to RDA were 123,09±44,39 and 101,28±56,23, respectively.

Surgical cancer patients and non-surgical cancer patients have been observed to meet protein requirements. Meyerhardt et al. In studies of cancer patients, total energy intake was 1791 kkal (114). The sources of proteins are divided into vegetable and animal. The richest of vegetable sources are dry legumes, nuts, seeds, cereals and various vegetables and fruits. Animal sources are various meats, milk and products. Protein-rich foods, especially those of animal origin, are also rich in fat content and provide high energy. It has been reported that protein intake imbalance usually correlates with larynx, pancreas, colon, rectum, breast, endometrium, prostate and kidney cancers (115).

In a study entitled "Defining the Role of Dietary Intakes in Cancer Cachexia" published in the journal Clinical Nutrition in 2016 and held at the Jewish General Hospital in Montreal, the effects of energy and protein consumption of cancer patients on anorexia and cachexia status were investigated. In this study, the energy and protein that patients should take are at least 30 kcal / kg and 1.3 g protein / kg, respectively. With reference to this recommendation, the food consumption records of patients were checked for six years from November 2009 to March 2015. As a result of this study, in the case of 405 cancer cases, 320 of the data could be reached. Only 17% stated that they could achieve the recommended energy and protein values, 26.9% had very bad nutrition and the rest had low protein and low energy feed (116).

There was a statistically significant difference in terms of fat (g) values according to the surgical situation (Z = -2,124, p = 0,034). The fat (g) value of the patients who underwent surgery was statistically higher than those who did not undergo surgery.). Fat consumption values of patients underwent surgery were statistically significantly higher than those without surgery. Mean fat intake of surgical patients was 59,05±23,64; non-surgical cancer was 49,68±30,27 g , and the acceptance percentages according to RDA were 90,02±35,99 and 75,70±46,27, respectively.

The study was carried out with a total of 50 oncology patients, 26 males and 24 females, who had been referred to Ankara Söğütözü Bayındır Hospital oncology department from 01 July 2014 to 01 October 2014 and newly diagnosed by the doctor. In the study, the patients had three days of food consumption records before and after treatment. The average total fat consumption of female patients by diet; 56.6 + -20.7g (14.7% of the total energy) before treatment and 53.4 + -17.9g (14.2% of the total energy) after the treatment. The average total fat consumption of male patients in the diet; Before treatment, 61.9 ± 23.4 g (14.0% of the total energy) was found to be 50.3 + - 22.0 (12.9% of the total energy) after the treatment. The difference was statistically significant ($p < 0.05$) (117).

There was a statistically significant difference in the fiber (g) values of the patients according to the surgical situation (Z = -2,278, p = 0.023). The fiber (g) value of the patients who underwent surgery was statistically significantly higher than those who did not undergo surgery. The fiber (g) value of the patients who underwent surgery was statistically higher than those who did not undergo surgery. Fiber values of patients underwent surgery were statistically significantly higher than those without surgery. Mean fiber intake of surgical patients was 13, 30± 6,07; non-surgical cancer was 10,33±7,24 g , and the acceptance percentages according to RDA were 47,27±18,20 and 38,60±27,05, respectively.

A total of 50 oncology patients, 26 males and 24 females, who applied to Bayındır Hospital's Oncology Department and newly diagnosed, were performed. Fiber consumption was 10.0 gr before treatment and 7.9 gr after treatment ($p < 0.05$) (117).

Micronutrients are required for the metabolism of macro-nutrients taken on a diet. These are vitamins and minerals. Vitamins function by their own structure or coenzymes. The inability or imbalance of these nutrients, which have important functions in organism, is important in protecting and treating various diseases. If the general functions are

summarized; in cell proliferation and in the development of cells, in the formation and preservation of cell membrane structure, in the formation of immunomodules and in gene transcripts. Micronutrients are also required for the protection of cancer; to prevent carcinogenesis, to increase detoxification, to control cell replication, malignancy and change, and to provide intercellular communication (117).

In this study, some vitamin and mineral intake of patients were found to be lower than recommended (Table 4.5). Non-surgical cancer patients received 39% B1 vitamins, 58% B6 vitamins and 56% vitamin C; surgical cancer patients' respectively 51%, 65% and 58% of the vitamins were taken. There was no significant difference in vitamin intake among surgical interventions ($p > 0.05$).

Epidemiological studies suggest that there is an inverse relationship between vitamin D and colon and rectum cancers (118). In addition, vitamin C and B-carotene of Helicobacter pylori-associated cancers reduce this risk (119).

When minerals are evaluated; 83% of iron, 63% of calcium, 44% of magnesium and 73% of zinc were met in non-surgical cancer patients. In surgical cancer patients, 94%, 69%, 48% and 77% respectively were met. There was no significant difference between minerals and surgical status ($p > 0.05$).

In this study, the nutritional status of cancer-diagnosed, surgical and non-surgical cancer patients was determined. Their inadequate and unbalanced diet as their lifestyle may also be a risk factor in the development of their disease. In addition, patients may have decreased nutrient intake as a result of illness. The necessity of hunger for some analyzes and tests of patients and the dissatisfaction with hospital food in general may also be the reasons for the decline in food consumption.

Fat-free milk powder (49-52% lactose, 26-28% casein, 6-7% whey protein, 0.7% 1.3 fats and 1200-1300mg / 100g calcium), the calcium mineral taken from a study showed that it reduced the risk of colon cancer (115).

In a study conducted in Japan, a significant correlation was found between dietary magnesium intake and decreased risk of colorectal cancer in men (120).

Over the past two decades, a significant increase in the life span of patients has been achieved with multifaceted treatment approaches that are effective for cancer patients, whereas nutritional problems related to cancer and cancer treatment have begun to emerge

as important causes of morbidity and mortality. Early identification of nutritional deficiencies and initiation of nutritional support are important for reducing the risk of malnutrition after surgery, increasing the response to chemotherapy, reducing infection rates, increasing clinical response and life span. In this direction, nutritional screening tests should be effectively used to reduce and prevent the mortality and morbidity of diseases that are recurred during hospitalization, hospitalization, and hospitalization.

Malnutrition screening tests may not be very effective unless they detect potential malnutrition problems if they are not repeated at regular intervals. Particularly in cancer patients, hospitalization and screening tests should be performed and patients should be followed up for malnutrition and necessary interventions should be done early. Screening tests should be repeated at least once a week while the patient remains hospitalization. In this case, many complications that may develop after surgery can be prevented, the length of stay in the hospital can be shortened and this can contribute to the decrease of health expenditures. Determining these is related with all the health personnel in contact with the patient and especially the dietician and doctor in the treatment. Protocols should also be established for the routine use of screening tests in hospitals and all health care facilities.

6. References

1. **Pressoir M, Desne S, Berchery D, Rossignol G, Poiree B, Meslier M, et. al.** *Prevalence, risk factors and clinical implications of malnutrition in French Comprehensive Cancer Centres.* 2010. pp. 966-71.

2. **Wie GA, Cho YA, Kim SM, Bae JM, Joung H.** *Prevalence and risk factors of malnutrition among cancer patients according to tumor location and stage in the National Cancer Center in Korea.* s.l. : Nutrition, 2010. pp. 263-8.

3. **Sesterhenn AM, Szalay A, Zimmermann AP, Werner JA, Barth PJ, Wiegand S.** *Significance of autopsy in patients with head and neck cancer.* s.l. : Laryngorhinootologie, 2012. pp. 375-80.

4. **Pacelli F, Bossola M, Rosa F, Tortorelli AP, Papa V, Doglietto GB.** *Is malnutrition still a risk factor of postoperative complications in gastric cancer surgery. .* s.l. : Clin Nutr., 2008. pp. 398–407.

5. **Guigoz Y, Vellas B, and Garry PJ.** *Mini Nutrition Assesment: a practical assesment tool for grading the nutritional state of elderly patients.* 1994. pp. 15-59.

6. **Slaviero KA, Read JA, Clarke SJ, and Rivory LP.** *Baseline nutritional assesment in advanced cancer patients receiving palliative chemotherapy.* 2003. pp. 148-157.

7. **Yoon Jung Yang, Mi Kyung Kim, Se Hee Hwang, Younjhin Ahn, Jae Eun Shim, Dong Hyun Kim.** *Relative validities of 3-day food records and the food frequency questionnaire.* s.l. : Nutrition Research and Practise, 2010. pp. 142-148.

8. **Baykara, O.** *Kanser Tedavisinde Güncel Yaklaşımlar.* İstanbul : s.n., 2016. doi: 10.5505/bsbd.2016.93823.

9. **Fitzmaurice C, Dicker D, Pain A, Hamavid H, Moradi-Lakeh M,MacIntyre MF, Allen C ve ark.** *The Global Burden of Cancer 2013.* 2015.

10. **Yıldız Ö, D.G.** *Kanser ve Beslenme. Sağlıkta ve Hastalıkta Beslenme Sempozyum Dizisi.* 2004. pp. 41, 45-57.

11. **Hanf, V.,Gonder, U.** *Nutrition and primary prevention of breast cancer: foods, nutrients and breast cancer risk. European Journal of Obstetrics & Gynecology and Reproductive Biology.* 2005. pp. 139-149. Vol. 123.

12. **Da Silva, H.G.V., de Andrade, C.F.,Moreira, A.S.B.** *Dietary intake and nutritional status in cancer patients: comparing adults and older adults. Nutrición Hospitalaria.* 2014. pp. 907-912. Vol. 4 (29).

13. **Baysal Ayşe, .** *Kanseri Tanıyalım.* W.C. (2004). pp. 11-34.

14. **WHO, I.** *The Glocoban Project.* 2012.

15. **Organization., WHO. (2007). Cancer control: knowledge into action: WHO guide for effective programmes (c. 2): World Health.**

16. **Koksal G, Gokmen H,.** *Çocuk Hastalıklarında Beslenme Tedavisi.* 3. Baskı. Ankara : s.n., 2013. p. 199.

17. **Selcuk H.** *Malnütrisyon ve Önemi* . Başkent Üniversitesi Tıp Fakültesi, İç Hastalıkları Anabilim Dalı, Gastroenteroloji Bilim Dalı, Ankara : s.n., 2012.

18. **Nelson, K.A., Walsh, D.,Sheehan, F.** *Journal of Clinical Oncology.* 1994. pp. 213-225. Vol. 12.

19. *Clinical nutrition.* **Norman, K., Pichard, C., Lochs, H.,Pirlich, M.,.** 2008, Vol. 27 (1), pp. 5-15.

20. **Kyle, U., Genton, L., Hans, D., Karsegard, L., Slosman, D.,Pichard, C.** *European journal of clinical nutrition.* 2001. pp. 663-672. Vol. 55 (8).

21. **Cruz-Jentoft, A.J., Baeyens, J.P., Bauer, J.M., Boirie, Y., Cederholm, T., Landi, F.** *(2010) Sarcopenia: European consensus on definition and diagnosis Report of the European Working Group on Sarcopenia in Older People. Age and ageing, afq034.*

22. **1. Gallagher, D., Ruts, E., Visser, M., Heshka, S., Baumgartner, R.N., Wang, J. ve diğerleri. (2000) Weight stability masks sarcopenia in elderly men and women. American Journal of Physiology-Endocrinology And Metabolism, 279 (2), E366-E375.**

23. **White, J.V., Guenter, P., Jensen, G., Malone, A., Schofield, M., Group, A.M.W. and et.** *Consensus statement of the academy of nutrition and dietetics/american society for parenteral and enteral nutrition: characteristics recommended for the identification and documentation of adult malnutrition (undernutrition).* 2012.

24. **de Mutsert, R., Grootendorst, D.C., Indemans, F., Boeschoten, E.W., Krediet, R.T., Dekker, F.W.** *Association between serum albumin and mortality in dialysis patients is partly explained by inflammation, and not by malnutrition.* 2009. pp. 127-135. Vol. 19 (2).

25. **Ellegård, L.,Bosaeus, I.** *Biochemical indices to evaluate nutritional support for malignant disease. Clinica chimica acta.* 2008. pp. 23-27. Vol. 390 (1).

26. **Donini, L.M., Ricciardi, L.M., Neri, B., Lenzi, A.,Marchesini, G.** *Risk of malnutrition (over and under-nutrition): Validation of the JaNuS screening tool. Clinical nutrition.* 2014. pp. 1087-1094. Vols. 33 (6), .

27. **Soeters, P.B., Reijven, P.L., Schols, J.M., Halfens, R.J., Meijers, J.M.,van Gemert, W.G.** *A rational approach to nutritional assessment. Clinical nutrition.* 2008. pp. 706-716. Vol. 27 (5).

28. **S., Kocatürk C. Kalafat.** *AKCİĞER KANSERLİ HASTALARDA MALNUTRİSYON VE PERİOPERATİF NÜTRİSYON DESTEĞİ.* İSTANBUL : s.n., 2016.

29. **MacDonald, N., Easson, A.M., Mazurak, V.C., Dunn, G.P.,Baracos,.** *Understanding and managing cancer cachexia. Journal of the American College of Surgeons,.* 2003. pp. 143-161. Vol. 197 (1).

30. **Bosaeus, I.** *Nutritional support in multimodal therapy for cancer cachexia. Supportive Care in Cancer.* 2008. pp. 447-451. Vol. 16 (5).

31. **Stephens, N.,Fearon, K.** *Anorexia, cachexia and nutrition. Medicine,.* 2008. pp. 78-81. Vol. 36 (2).

32. **Paccagnella, A., Morassutti, I.,Rosti, G.** *Nutritional intervention for improving treatment tolerance in cancer patients. Current opinion in oncology,.* 2011. pp. 322-330. Vol. 23 (4).

33. *Kanser Hastasında Beslenme.* **Erdoğan B, Ç.İ.** 2011, pp. 24, 25-29.

34. *Beyond anorexia-cachexia. Nutrition and modulation of cancer patients' metabolism: Supplementary, complementary or alternative anti-neoplastic therapy.* **Laviano, A., Seelaender, M., Sanchez-Lara, K., Gioulbasanis, I., Molfino, A.,Fanelli, F.R.** 2011, p. 668. S87-S90.

35. **Fearon, K., Strasser, F., Anker, S.D., Bosaeus, I., Bruera, E., Fainsinger, R.L.** *The Lancet Oncology.* 2011. pp. 489-495. Vol. 12(5).

36. *Nutritional Support Strategies for Malnourished Cancer Patients.* **Schueren, Van Bokhorst- de van der.** 2005, Eur J Oncol Nurs, Vol. 9, pp. 74-83.

37. **Ravasco, P., Monteiro-Grillo, I., Vidal, P.M.,Camilo, M.E.** *Cancer: disease and nutrition are key determinants of patients' quality of life. Supportive Care in Cancer.* 2004. pp. 246-252. Vols. 12(4), .

38. **Caro, M.M.M., Laviano, A.,Pichard,.** *Nutritional intervention and quality of life in adult oncology patients.* 2007. pp. 289-301. Vol. 26 (3).

39. *Kanserli hastalarda beslenme.* **Çehreli, R.** 2004. XIII. TPOG Ulusal Pediatrik. pp. 18-22.

40. **Barber, M.D. Nutrition,.** *Cancer cachexia and its treatment with fish-oil-enriched nutritional supplementation.* 2001. pp. 751-755.

41. *Çocuk Kanser Hastalarında Beslenme.* **Dinler, G.** 7 (1), 2009, Güncel Pediatri Dergisi, p. 31.

42. **Vinci, E., Rampello, E., Zanoli, L., Oreste, G., Pistone, G.,Malaguarnera, M.** *Serum carnitine levels in patients with tumoral cachexia.* 2005. pp. 419-423.

43. **Morley, J.E.,Farr, S.A.** *Cachexia and neuropeptide Y. Nutrition.* 2008. pp. 815-819.

44. **WHO.** *World Health Statistics 2006.* Geneva : s.n., 2006.

45. **Giannousi, Z., Gioulbasanis, I., Pallis, A.G., Xyrafas, A., Dalliani, D., Kalbakis, K. et al.** *Nutritional status, acute phase response and depression in metastatic lung cancer patients: correlations and association prognosis.* 2012. pp. 1823-1829.

46. **Isenring, E.,Elia, M. Nutrition,.** *Which screening method is appropriate for older cancer patients at risk for malnutrition?* 2015. pp. 594-597.

47. **Santarpia L, Contaldo F, Pasanisi F.** *Nutritional screening and early treatment of malnutrition in cancer patients.* 2011. pp. 2(1):27–35.

48. **Nicolini A, Ferrari P, Masoni MC, Fini M, Pagani S, Giampietro O, Carpi A.** *Malnutrition, anorexia and cachexia in cancer patients: a mini-review on pathogenesis and treatment.* 2013. pp. 62(8):807–817.

49. **Nicolinia A, Chiara M, Ferrari P, Fini M, Pagani S, Giampietro O, Carpid A.** *Malnutrition, anorexia and cachexia in cancer patients: A mini-review on pathogenesis and treatment.* 2013. pp. Pages 807-817. Vol. 67.

50. **Terashima, Keiichi FujiyaTaiichi KawamuraKatsuhiro OmaeRie MakuuchiTomoyuki IrinoMasanori TokunagaYutaka TanizawaEtsuro BandoMasanori.** *Impact of Malnutrition After Gastrectomy for Gastric Cancer on Long-Term Survival.* s.l. : Springer Internatıonal Publıshıng, 2018. pp. 1-10.

51. **Rakıcıoğlu, Şenay Burçin AlkanMehmet ArtaçNeslişah.** *he relationship between nutritional status and handgrip strength in adult cancer patients: a cross-sectional study.* 2018.

52. **Staal-van den Brekel AJ, Dentener MA, Schols AM, et al.** *Increased resting energy expenditure and weight loss are related to a systemic inflammatory response in lung cancer patient* . s.l. : J Clin Oncol, 1995.

53. *Malnutrition Identified by the Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition Consensus Criteria and Other Bedside Tools Is Highly Prevalent in a Sample of Individuals Undergoing Treatment for Head- Neck Ca.* **David M. Vock, PhD, Adam J. Kuchnia, MS, RD, LD, CNSC, Gautam Jha, MD, Naomi Fujioka, MD, Venkatesh Rudrapatna, MD, MPH, Manish R. Patel, DO, Levi Teigen,**

BA, RD, Carrie P. Earthman, PhD, RD, LD First Published October 7, 2016 Research A. 2016, JPEN J Parenter Enteral Nutr, pp. 139-147.

54. *Evaluation of Nutritional Status in Cancer Patients Receiving Radiotherapy.* **Unsal D, Mentes B, Akmansu M, Uner A, Oguz M and Pak Y.** 2, 2016, American Journal of Clinical Oncology , Vol. 29, pp. 183-187.

55. **John S. L. Leung, Alfred Seto, and George K. H. Li.** *Nutrition and Cancer.* 2017. pp. 464–469 . Vol. 69.

56. **Leung J, Seto A, Li GK.** *Association Between Preoperative Nutritional Status and Postoperative Outcome in Head and Neck Cancer Patients.* 2017 Apr. pp. 464-469. Vol. 69.

57. *Nutritional Advice in Older Patients at Risk of Malnutrition during Treatment for Chemotherapy: A Two-Year Randomized Controlled Trial.* **Isabelle Bourdel-Marchasson, Christelle Blanc-Bisson, Adélaïde Doussau, Christine Germain, Jean-Frédéric Blanc, Jérôme Dauba, Cyril Lahmar, Eric Terrebonne, Cédric Lecaille, Joël Ceccaldi, Laurent Cany, Sandrine Lavau-Denes, Nadine Houede, François Chomy.** [ed.] Vincent Wong. 9, Sep. 2014, PLoS One, Vol. 9.

58. *Nutritional support in patients with colorectal cancer during chemotherapy: does it work.* **Dobrila-Dintinjana R1, Trivanovic D, Zelić M, Radić M, Dintinjana M, Petranović D, Toni V, Vukelic J, Matijasic N.** May 2013 , Hepatogastroenterology, Vols. 60(123):475-80.

59. *Prospective Study of Malabsorption and Malnutrition After Esophageal and Gastric Cancer Surgery.* **Heneghan HM1, Zaborowski A, Fanning M, McHugh A, Doyle S, Moore J, Ravi N, Reynolds JV.** Nov 2015, Ann Surg., Vols. 262(5):803-7.

60. *Prevalence, risk factors and clinical implications of malnutrition in French Comprehensive Cancer Centres.* **M Pressoir, S Desné, D Berchery, G Rossignol,B Poiree, M Meslier, S Traversier,M Vittot, M Simon, J P Gekiere, J Meuric, F Serot, M N Falewee, I Rodrigues, P Senesse, M P Vasson, F Chelle, B Maget, S Antoun, and P Bachmann.** French : s.n., Mar 16, 2010 , Br J Cancer, Vols. 102(6): 966–971.

61. **Strasser, M. Aapro J. Arends F. Bozzetti K. Fearon S. M. Grunberg J. Herrstedt J. Hopkinson N. Jacquelin-Ravel A. Jatoi S. Kaasa F.** *Early recognition of malnutrition and cachexia in the cancer patient: a position paper of a European School of Oncology Task Force.* 2014. pp. 1492–1499. Vols. 25, Issue 8.

62. *Kanser hastalarında kemoradyoterapi sırasında beslenme yönetiminde disiplinler arası işbirliğinin yeri: Bir pilot çalışma.* **Atasoy, Beste M., et al.** Istanbul : s.n., 2012, Marmara Üniversitesi Tıp Fakültesi Dergisi, Vols. 25:32-6.

63. *The effect of chemotherapy on nutritional status and weakness ingeriatric gastrointestinal system cancer patients.* **Bicakli D, Ozveren A, Uslu R, Dalak R, Cehreli R, Uyar M, Karabulut B, Akcicek F.** İzmir : s.n., September 17, 2017, Nutrition, pp. 39-42.

64. **Correia, M.I.T.,Waitzberg, D.L.** *The impact of malnutrition on morbidity, mortality, length of hospital stay and costs evaluated through a multivariate model analysis.* 2003. pp. 235-239. Vol. 22 (3).

65. *Prevalence of malnutrition and 12-month incidence of mortality in two Sydney teaching hospitals.* **Middleton, M., Nazarenko, G., Nivison-Smith, I.,Smerdely, P.** 31 (8), 2001, Internal medicine journal, pp. 455-461.

66. *Prevalence of malnutrition on admission to hospital–Acute and elective general surgical patients.* **Kahokehr, A.A., Sammour, T., Wang, K., Sahakian, V., Plank, L.D.,Hill, A.G.,.** 5 (1), e21-e25., s.l. : ESPEN, 2010, the European e-Journal of Clinical Nutrition and Metabolism.

67. *ASPEN clinical guidelines nutrition screening, assessment, and intervention in adult.* **Mueller, C., Compher, C.,Ellen, D.M.** 35 (1), 2011, ASPEN Journal of Parenteral and Enteral Nutrition, pp. 16-24.

68. *Importance of early nutritional screening in patients with gastric cancer.* **Gavazzi, C., Colatruglio, S., Sironi, A., Mazzaferro, V.,Miceli, R.** 2011, British Journal of Nutrition, Vol. 106 (12), pp. 1773-1778.

69. **Kondrup, J., Allison, S.P., Elia, M., Vellas, B.,Plauth, M.** *ESPEN guidelines for nutrition screening 2002.* 2003. pp. 415-421. Vol. 22 (4).

70. **Guaitoli, P.R., Jansma, E.P.,de Vet, H.C.** *Nutrition screening tools: does one size fit all? A systematic review of screening tools for the hospital setting.* 2014. pp. 39-58. Vol. 33 (1).

71. **Bingham SA, Gill C, Welch A, Cassidy A, Runswick SA, Oakes S, Lubin R, Thurnham DI, Key TJ, Roe L, Khaw KT, Day NE.** *Validation of dietary assessment methods in the UK arm of EPIC using weighed records, and 24-hour urinary nitrogen and potassium and serum vitamin C and carotenoids as biomarkers.* 1997. pp. 137–151. Vol. 26.

72. **Bingham SA, Luben R, Welch A, Wareham N, Khaw KT, Day N.** *Are imprecise methods obscuring a relation between fat and breast cancer?* . 2003. pp. 212–214. Vol. 362.

73. **Freedman LS, Potischman N, Kipnis V, Midthune D, Schatzkin A, Thompson FE, Troiano RP, Prentice R, Patterson R, Carroll R, Subar AF.** *A comparison of two dietary instruments for evaluating the fat-breast cancer relationship. Int J Epidemiol.* 2006. pp. 1011-1021. Vol. 35.

74. **Pekcan, G.** *Diyet El Kitabı.* [ed.] A. Baysal & e. al. Ankara : Hatipoğlu Basım ve Yayım San. Tic. Ltd. Şti., 2011. pp. 67-142 .

75. *Impact of weight loss, appetite, and the inflammatory response on quality of life in gastrointestinal cancer patients. Nutrition and Cancer.* **O'Gorman P, McMillan DC, McArdle CS.** 1998, pp. 76-80.

76. **N, Müdüroğlu, [ed.].** *Dünya Sağlık Örgütü. Kanser Ölümleri.* s.l. : LÖSEV, 2003. pp. 3-4.

77. ***All Cancers (excluding non-melanoma skin cancer) Estimated Incidence, Mortality and Prevalence Worldwide in 2012.*** **s.l. : World Health Organization, .**

78. T.C.Sağlık Bakanlığı, T.H.S.K.,. ***Kanser İnsidansları*** **. 2009.**

79. Niederhuber JE, et al. ***Abeloff's Clinical Oncology, Surgical interventions in cancer.*** **5 th. ed. Philadelphia : s.n., 2014.**

80. ***What is cancer surgery? Cancer.Net. http://www.cancer.net/navigating-cancer-care/how-cancer-treated/surgery/what-cancer-surgery.*** **. 2017.**

81. Pekcan, G. ***Enteral ve Parenteral Beslenme. (S. Başoğlu, N. Karaağaoğlu, N. Erbaş, A. Ünlü (Der.)). Malnütrisyon; Hastanın Antropometrik Yönden Değerlendirilmesi ve İzlenmesi.*** **Ankara : Çağın Yayınevi, 1996. pp. 17-38.**

82. Baysal, A., Aksoy, M., Bozkurt, N., Merdol, T. K., Pekcan, G., Keçecioğlu, S. etc. ***Diyet El Kitabı*** **. 4. Ankara : Hatipoğlu Yayınevi., 2002.**

83. ***MNA® Mini Nutritional Assessment as a nutritional screening tool for hospitalized older adults; rationales and feasibility.*** **I. Calvo, J. Olivar, E. Martínez, A. Rico, J. Díaz and M. Gimena. 5, Madrid, Spain : s.n., Sept. 2012, Nutrición Hospitalaria, Vol. 27.**

84. ***Mini Nutritional Assessment.*** **Cereda, Emanuele. [ed.] Edited by Ronni Chernoff and Tommy Cederholm. 1, 2012, Vol. 15, pp. 29-41.**

85. De Luis, D.A., Izaola, O., Cuellar, L., Terroba, M.C., Cabezas, G., Rojo, S. and et. ***Nutritional assessment: predictive variables at hospital admission related with length of stay. Annals of Nutrition and Metabolism.*** **2006. pp. 394-398. Vol. 50(4).**

86. Mullen, J.T., Davenport, D.L., Hutter, M.M., Hosokawa, P.W., Henderson, W.G., Khuri, S.F. and et. ***Impact of body mass index on perioperative outcomes in patients undergoing major intra-abdominal cancer surgery. Annals of Surgical Oncology,.*** **2008.**

87. Kristal AR, Peters U, Potter JD. ***Is it time to abandon the food frequency questionnaire? Cancer Epidemiol Biomarkers Prev.*** **2005. pp. :2826–2828. Vol. 14.**

88. Kristal AR, Potter JD. ***Not the time to abandon the food frequency questionnaire: counterpoint. Cancer Epidemiol Biomarkers Prev.*** **2006. pp. 1759–1760. Vol. 15.**

89. Day NE, McKeown N, Wong MY, Welch A, Bingham S. ***Epidemiological assessment of diet: a comparison of a 7-day diary with a food frequency questionnaire using urinary markers of nitrogen, potassium and sodium.*** **2001. pp. :309–317. Vol. 30.**

90. ***Relative validities of 3-day food records and the food frequency questionnaire.*** **Yoon Jung Yang, Mi Kyung Kim, Se Hee Hwang, Younjhin Ahn, Jae Eun Shim, and Dong Hyun Kim. 2, April 2010, Nutr Res Pract, Vol. 4, pp. 142-148.**

91. Program, Beslenme Bilgi Sistemi (BeBis)-Bilgisayar Paket.

92. Pres., National Academy. ***Food and Nutrition Board Recommended Dietary Allowances (RDA)*** **. Washington : s.n., 1989.**

93. ***Yüzüncü Yıl Üniversitesi Tıp Fakültesi Tıbbi Onkoloji Bilim Dalı'na başvuran kanser hastalarının epidemiyolojik değerlendirilmesi*** **. Alıcı S, İ.M., Doğan E. 2006, Türk Onkoloji Dergisi, Vol. 2(21), pp. 87-97.**

94. ***Global cancer statistics,*** **. Parkin, D.M., Bray, F., Ferlay, J.,Pisani, P. A ,. 2005, Cancer Journal for Clinicians, Vol. 55(2), pp. 74-108.**

95. Eaton, L. ***World cancer rates set to double by 2020.*** **. 2003. pp. 728-728. Vol. 326(7392).**

96. ***A subjective global assessment of nutritional status: A study of 1400 surgical patients.*** **Oğuz, M., Kurukahvecioğlu, O., Salman, B., Onuk, E.,Tatlıcıoğlu, E,. 2005, Gazi Medical Journal, Vol. 16(2).**

97. Leandro-Merhi VA, de Aquino JLB, de Camargo JGT, Frenhani PB, Bernardi JLD, Mclellan KCP. . ***Clinical and nutritional status of surgical patients with and without malignant diseases: cross-sectional study.*** **. s.l. : Arq Gastroenterol., 2011. pp. 48:58–61.**

98. Offner PJ, Moore EE, Biffl WL. Arch Surg. ***Male Gender Is a Risk Factor for Major Infections After Surgery.*** **1999. pp. 935–940. Vol. 134(9). doi:10.1001/archsurg.134.9.935.**

99. ***Malnutrition and Its Impact on Cost of Hospitalization, Length of Stay, Readmission and 3-Year Mortality.*** **Lim, Su Lin, et al. 3, 2012, Clinical Nutrition, Vol. 31, pp. 345-350. doi:10.1016/j.clnu.2011.11.001..**

100. ***Distress, anxiety, and depression in cancer patients undergoing chemotherapy.*** **al., Pandey M and et. 2006, World J Surg Oncol.**

101. UK, Cancer Research. Emotional effects of radiotherapy. ***http://www.cancerresearchuk.org/about-cancer/cancer-in-general/treatment/radiotherapy/side-effects/general-radiotherapy/emotional-effects#collapseListRefeferences.*** **2016.**

102. ***Aspects of taste and compliance in patients.*** **P., Ravasco. 9, 2005, Eur J Oncol Nurs, pp. 84-91.**

103. ***Self-reported taste and smell changes during cancer chemotherapy.*** **Bernhardson BM, Tishelman C, Rutqvist LE. 16, 2008, Support Care Cancer , pp. 275-283.**

104. ***Kemoterapi Alan Hastalarda Tat Alma Değişikliği.*** **Sözeri E, Kutlutürkan S. 2015, J Breast Health . DOI: 10.5152/tjbh.2015.2489.**

105. team, The American Cancer Society medical and editorial content. Managing eating problems caused by surgery, radiation, and chemotherapy. 2015. https://www.cancer.org/treatment/survivorship-during-and-after-treatment/staying-active/nutrition/nutrition-during-treatment/manage-eating-probs.html.

106. ***Clinical application of subjective global assessment in Chinese patients with gastrointestinal cancer.*** **Wu, B.-W., Yin, T., Cao, W.-X., Gu, Z.-D., Wang, X.-J., Yan, M..et al. 15(28), 2009, World Journal of Gastroenterology, p. 3542.**

107. ***Comparison of different nutritional assessments in detecting malnutrition among gastric cancer patients.*** **Ryu, S.W.,Kim, I.H. 16(26), 2010, World Journal of Gastroenterology, p. 3310.**

108. Silverman LM, Christensin RH:, Burtis CA, Ashwood ER, W.B Sounders,. ***Amino acids and Proteins.In: Tietz Textbook of Clinical Chemistry.*** **Philadelphia : s.n., 1994. pp. 671-673.**

109. ***YAŞLI HASTALARDA CERRAHİ SONRASI MORTALİTEYE ETKİ EDEN FAKTÖRLER.*** **Mayir B, Altınel Ö, Özerhan İ, Ersöz N, Harlak A, Kılbaş Z,Çolak T, Erdoğan O. GATA Genel Cerrahi Anabilim Dalı, Ankara. : s.n., 2010, Anatol J Clin Investig , pp. 32-35.**

110. ***Kanserde Serum Arginaz Aktivitesi.*** **Meram İ, Ahi S, Tarakçıoğlu M. 7, Gaziantep Üniv. Tıp Fakültesi Biyokimya AD, Gaziantep : s.n., 2000, Van Tıp Dergisi, , Vol. 1.**

111. Jeanne A. Drisko, MD, Julia Chapman , MD & Verda J. Hunter , MD. ***The Use of Antioxidants with First-Line Chemotherapy in Two Cases of Ovarian Cancer.*** **2003. pp. 118-123. Vol. 22.**

112. Van Stijn, M.F., Ligthart-Melis, G.C., Boelens, P.G., Scheffer, P.G., Teerlink, T., Twisk, J.W. et al. ***Antioxidant enriched enteral nutrition and oxidative stress after major gastrointestinal tract surgery. .*** **2008. pp. 6960–6969. Vol. 14.**

113. ***Dietary risk factors for colon and rectal cancers: a comparative case-control study. J.*** **Wakai, K., Hirose, K., Matsuo, K., Ito, H., Kuriki, K., Suzuki, T. et al. 16(3) , 2006, Journal of Epidemiology, pp. 125-135.**

114. ***Assessment of a dietary questionnaire in cancer patients receiving cytotoxic chemotherapy.*** **Meyerhardt, J.A., Heseltine, D., Campos, H., Holmes, M.D., Willett, W.C., Winer, E.P. et al. 23(33), 2005, Journal of Clinical Oncology,, pp. 8453-8460.**

115. Parodi, P. ***A role for milk proteins and their peptides in cancer prevention .*** **2007. pp. 813-828. Vol. 8. 13.**

116. ***Defining the role of dietary intake in determining weight change in patients with cancer cachexia.*** **Nasrah R, Kanbalian M, Van Der Borch C, Swinton N, Wing S, Jagoe RT. February 2018, Clinical Nutrition, pp. 235-241.**

117. Samur, G. Vitaminler Mineraller ve Sağlığımız. 2012.

118. Lipworth, L., Bender, T.J., Rossi, M., Bosetti, C., Negri, E., Talamini, R. et al. ***Dietary vitamin D intake and cancers of the colon and rectum: a case-control study in Italy. Nutrition and Cancer.*** **Italy : s.n., 2008. pp. 70-75.**

119. ***Chemoprevention of gastric dysplasia: randomized trial of antioxidant supplements and anti-Helicobacter pylori therapy.*** **Correa, P., Fontham, E.T., Bravo, J.C., Bravo, L.E., Ruiz, B., Zarama, G. et.al. 92(23), , 2000, Journal of the National Cancer Inst, pp. 1881-1888.**

120. ***High dietary intake of magnesium may decrease risk of colorectal cancer in Japanese men. .*** **Ma, E., Sasazuki, S., Inoue, M., Iwasaki, M., Sawada, N., Takachi, R. et al. 2010, The Journal of Nutrition,, pp. 779- 785.**

121. Dewys WD, Begg C, Lavin PT, Band Pr, Bennett JM, et al. ***Prognostic effect of weight loss prior to chemotherapy in cancer patients.*** **s.l. : Eastern Cooperative Oncology Group , 1980. pp. 491-497.**

122. Jane A. Read, Naomi Crockett, Dianne H. Volker, Penny MacLennan, S. T. Boris Choy, Philip Beale, and Stephen J. Clarke. ***Nutritional Assesment in Cancer: Comparing the Mini-Nutritional Assesment (MNA) with the Scores Patient-Generated Subjective Global Assessment (PGSGA).*** **2005. pp. 51-56.**

123. J. ARENDS, V. BARACOS, H. BERTZ, F. BOZZETTİ, P.C. CALDER, N.E.P. DEUTZ, N.ERİCKSON, A.LAVİANO, M.P.LISANTI, D.N.LOBO, D.C. MCMILLIAN, M.MUSCARITOLI, J.OCKENGA, M.PIRLICH, F.STRASSER, M. DE VAN DER SCHUEREN, A. VAN GOSSUM, P. VAUPEL, A. WEİMANN. ***ESPEN expert group recommendations for action against cancer related malnutrition.*** **2017. pp. 1-10.**

124. Leandro-Merhi VA, de Aquino JLB. Sales Chagas JFS. J. ***Nutrition status and risk factors associated with length of hospital stay for surgical patients.*** **s.l. : JPEN J Parenter Enteral Nutr., 2011. pp. 35:241–8.**

125. Portero-McLellan KC, Staudt C, Silva FR, Bernardi JLD, Frenhani PB, Leandro-Merhi VA. ***The use of calf circumference measurement as an anthropometric***

tool to monitor nutritional status in elderly inpatients. **s.l. : J Nutr Health Aging, 2010. pp. 14:266–70.**

126. ***117. Meyerhardt, J.A., Heseltine, D., Campos, H., Holmes, M.D., Willett, W.C., Winer, E.P. ve diğerleri.(2005) Assessment of a dietary questionnaire in cancer patients receiving cytotoxic chemotherapy. 23(33), 8453-8460.***

7. APPENDICES

ANNEX 1: Koç University Biomedical Research Ethics Committee Decision

Rumelifeneri Yolu Sarıyer 34450 İstanbul T: 0212 338 10 00 F: 0212 338 12 05 www.ku.edu.tr

KOÇ
ÜNİVERSİTESİ

ETİK KURUL KARARI

Toplantı Tarihi:	18.09.2017
Karar No:	2017.135.IRB2.046
Sorumlu Araştırıcı:	Aslıhan Yağcıoğlu
Araştırma Başlığı:	Cerrahi İşlem Geçirmiş ve Cerrahi İşlem Geçirmemiş Onkoloji Hastalarında Malnutrisyon Durumunun Saptanması
Başlangıç tarihi:	20.09.2017
Etik Kurul izninin süresi:	1 yıl (Uzatma hakkı mevcut olarak)

Koç Üniversitesi Etik Kurulu'na değerlendirilmek üzere başvuruda bulunduğunuz yukarıda künyesi yazılı projenizin başvuru dosyası ve ilgili belgeleri, Üniversitemiz **"Biyomedikal Araştırmalar Etik Kurulu"** tarafından araştırmanın gerekçe, amaç, yaklaşım ve yöntemleri dikkate alınarak incelenmiştir.

Yapılan inceleme sonucunda çalışmanın gerçekleştirilmesinde etik ve bilimsel sakınca bulunmadığına karar verilmiştir.

Notlar:

- Araştırma başlangıç tarihinin 6 aydan daha fazla gecikmesi durumunda Etik Kurul'a başvurularak tarihlerin değiştirilmesi gereklidir.
- Etik Kurul incelemesi ve onayı olmadan bu araştırmada kullanılan prosedürler, formlar ya da protokollerde herhangi bir değişiklik yapılamaz.
- Etik bakımdan sorun çıkması ya da şüpheli bir olay/beklenmeyen etki görülmesi durumunda derhal etik kurul bilgilendirilmelidir.
- Araştırmanın gerçekleştirileceği birimlerin yöneticilerinden de ayrıca izin alınması gerekli olabilir.

Saygılarımla,

Hakan S. Orer
Başkan

Koç Üniversitesi Etik Kurulları Sekreteryası T: 0212 338 11 76 chr@ku.edu.tr

ANNEX 2: Informed Consent Form

Yeditepe ÜniversitesiBeslenme ve Diyetetik Bölümü yüksek lisans öğrencisi *Dyt. Aslıhan Yağcıoğlu* tarafından yürütülen, Koç Üniversitesi Etik Kurulları'nın *[Etik Kurul onay numarası]* sayılı onayı ile izin verilen,*Cerrahi İşlem Geçirmiş ve Cerrahi İşlem Geçirmemiş Onkoloji Hastalarında Malnutrisyon Durumunun Saptanması* başlıklı araştırmaya katılımınız rica olunmaktadır.

Bu araştırmaya tamamen kendi iradenizle, herhangi bir zorlama veya mecburiyet olmadan gönüllü olarak katılımınız esastır. Lütfen aşağıdaki bilgileri okuyunuz ve katılmaya karar vermeden önce anlamadığınız her hangi bir husus varsa çekinmeden sorunuz.

ÇALIŞMANIN AMACI (Neden böyle bir araştırma yapmaya gerek duyuldu?)

Bu çalışmanın amacı onkoloji hastalarındaki tedavi şeklinin hastaların beslenme durumlarına etkisini araştırmaktır. Onkoloji hastalarında tedavi süresince kilo kayıpları görülmektedir. Bu çalışmada tanı konulması ile erken beslenme tedavisinin önemi vurgulanacaktır. Cerrahi işlem geçirmiş ve geçirmemiş onkoloji hastaları arasındaki beslenme farkına bakılacaktır.

PROSEDÜRLER

Bu çalışmaya gönüllü katılmak istemeniz halinde yürütülecek çalışmalar şöyledir:

Hastaların biyokimyasal bulguları (sistemden bakılacak, ayrıca müdahalede bulunulmayacak) alınacaktır ve 3 günlük hastanın/refakatçının tutacağı besin tüketim kaydı ile beslenme durumları değerlendirilecektir. Hastalara MNA (Küçük Beslenme Değerlendirmesi) adında mini bir anket uygulanacak ve bu anket ile hastaların beslenme durumları saptanacaktır.

OLASI RİSKLER VE RAHATSIZLIKLAR

Hastaya, hastalığın gerektirdiği rutin işlemler uygulanacak ve hastanın tedavisinde değişiklik olmayacaktır. Çalışmanın hastanın tedavisini etkileyecek herhangi bir riski bulunmamaktadır.

TOPLUMA VE/VEYA DENEKLERE OLASI FAYDALARI

Onkolojideki cerrahi işlem görmüş ve görmemiş hastaların beslenme durumlarının saptandığı bu çalışma bu konu üzerindeki az sayıdaki çalışmaya katkı sağlayacaktır ve ileride yapılacak çalışmalara yol göstererek destek olacaktır. Bu çalışma ile kanser türlerinde uygulanan tedavinin beslenmeyi nasıl etkilediği sorusuna cevap alınacaktır. Kanser sebebiyle cerrahi işlem görmüş veya kansertanısı alıp cerrahi işlem geçirmeyen/geçiremeyen hastaların beslenme durumları arasındaki fark saptanacaktır.

GİZLİLİK

Bu çalışmayla bağlantılı olarak elde edilen ve sizinle özdeşleşmiş her bilgi gizli kalacak, 3. kişilerle paylaşılmayacak ve yalnızca sizin izniniz ile ifşa edilecektir.

Hasta veya refakatçısından alınan bilgiler bilgisayar sisteminde şifre ile korunacaktır. İsim, soyad, imza ve hasta bilgilerine yalnızca araştırmacı ulaşabilecektir. Sağlık Bakanlığının oluşturduğu 'Klinik Araştırmalar Hakkında Yönetmelik' mevzuatına uygun olarak çalışma yapılacak ve gönüllü haklarının korunması sağlanacaktır.

KATILIM VE AYRILMA

Bu çalışmanın içinde olmak isteyip istemediğinize tamamen kendi iradenizle ve etki altında kalmadan karar vermeniz önemlidir.Katılmaya karar verdikten sonra, herhangi bir anda sahip olduğunuz herhangi bir hakkı kaybetmeden veya herhangi bir müeyyideye maruz kalmadan istediğiniz zaman ayrılabilirsiniz.

ARAŞTIRMACILARIN KİMLİĞİ

Bu araştırma ile ilgili herhangi bir sorunuz veya endişeniz varsa, lütfen iletişime geçiniz:

Dyt. Aslıhan YAĞCIOĞLU

e-mail: ayagcioglu@kuh.ku.edu.tr

Yukarıda yapılanaçıklamaları anladım.Sorularım tatmin olacağım şekilde yanıtlandı. Dilediğim zaman ayrılma hakkım saklı kalmak koşulu ile bu çalışmaya katılmayı onaylıyorum. Bu formun bir kopyası da bana verildi.

_____

Katılımcı Adı-Soyadı

_____

_____

Katılımcı İmzası Tarih

_____

_____

Araştırmacının İmzası Tarih

ANNEX 3: 3 Daily Food Consumption Form

	SABAH	ARA	ÖĞLE	ARA	AKŞAM	GECE
11. GÜN						
22. GÜN						
33. GÜN						

BESİN TÜKETİMLERİNİ YAZARKEN AŞAĞIDAKİ AÇIKLAMAYA UYGUN OLARAK YAZINIZ

EKMEK ; 1 İNCE DİLİM=25 GR, 1 PARMAK KALINLIĞINDA 1 AVUÇ İÇİ GENİŞLİĞİNDE

ÇORBA ; KEPÇE

PİLAV-MAKARNA ; TEPELEME YEMEK KAŞIĞI

MEYVE ; ADET (ORTA BOY, KÜÇÜK BOY)

MEYVE SUYU ; ÇEŞİDİ VE MİKTARI

ŞEKER ; ADET VE TATLI KAŞIĞI

ET-TAVUK-BALIK ; KÖFTE BÜYÜKLÜĞÜNDE

PEYNİR ; KİBRİT KUTUSU KADAR VE ÇEŞİDİ (TULUM, KAŞAR, BEYAZ)

YUMURTA ; ADET

SÜT-YOĞURT ; SU BARDAĞI VEYA ÇAY BARDAĞI

PATLAMIŞ VEYA TAZE MISIR ; SU BARDAĞI VEYA ADET

BİSKÜVİ-DONDURMA-ÇİKOLATA ; ÇEŞİDİ VE MİKTARI

KURUBAKLAGİLLER ; YEMEK KAŞIĞI

KURUYEMİŞLER ; ADET VEYA ÇAY BARDAĞI VE ÇEŞİDİ

BAL-REÇEL-PEKMEZ ; TATLI VEYA YEMEK KAŞIĞI

YAĞ ; SİLME TATLI VEYA YEMEK KAŞIĞI VE ÇEŞİDİ

ZEYTİN ; ADET VE ÇEŞİDİ

ANNEX 4: The Questionnaire Form

Mini Nutritional Assessment
MNA®

Soyad: Ad:

Cinsiyet: Yaş: Ağırlık, kg: Boy, cm: Tarih:

Aşağıdaki soruları kutulara uygun rakamları yazarak yanıtlayın. Yazdığınız rakamları toplayın. Eğer Tarama puanı 11 veya altında ise Malnutrisyon Gösterge Puanı'nı elde etmek için değerlendirmeye devam edin.

Tamara

A Son üç ayda iştahsızlığa, sindirim sorunlarına, çiğneme veya yutma zorluklarına bağlı olarak besin alımında bir azalma oldu mu?
0 = besin alımında şiddetli düşüş
1 = besin alımında orta derece düşüş
2 = besin alımında düşüş yok ☐

B Son üç ay içindeki kilo kaybı durumu
0 = 3 kg'dan fazla kilo kaybı
1 = Bilinmiyor
2 = 1-3 kg arasında kilo kaybı
3 = Kilo kaybı yok ☐

C Hareketlilik
0 = Yatak veya sandalyeye bağımlı
1 = Yataktan, sandalyeden kalkabiliyor ama evden dışarıya çıkamıyor
2 = Evden dışarı çıkabiliyor ☐

D Son üç ayda psikolojik stres veya akut hastalık şikayeti oldu mu?
0 = Evet 2 = Hayır ☐

E Nöropsikolojik problemler
0 = Ciddi bunama veya depresyon
1 = Hafif düzeyde bunama
2 = Hiçbir psikolojik problem yok ☐

F Vücut Kitle İndeksi (VKİ) = (Vücut ağırlığı-kg) / (Boy'un metre)²
0 = VKİ 19'dan az (19 dahil değil)
1 = VKİ 19'la 21 arası (21 dahil değil)
2 = VKİ 21'le 23 arası (23 dahil değil)
3 = VKİ 23 ve üzeri ☐

Tarama puanı (tamamı en çok 14 puan) ☐☐

12-14 puan: Normal nütrisyonel durum
8-11 puan: Malnütrisyon riski altında
0-7 puan: Malnütrisyonlu

Daha kapsamlı bir değerlendirme için G-R sorularını cevaplayınız

Değerlendirme

G Bağımsız yaşıyor (bakımevinde veya hastanede değil)
1 = Evet 0 = Hayır ☐

H Günde 3 adetten fazla reçeteli ilaç alma
0 = Evet 1 = Hayır ☐

I Bası yarası veya deri ülseri var
0 = Evet 1 = Hayır ☐

J Hasta günde kaç öğün tam yemek yiyor?
0 = 1 öğün
1 = 2 öğün
2 = 3 öğün ☐

K Protein alımı için seçilen besinler
- Günde en az bir porsiyon süt ürünü (süt, peynir, yoğurt) tüketiyor Evet ☐ Hayır ☐
- Haftada iki veya daha fazla porsiyon kuru baklagil veya yumurta tüketiyor Evet ☐ Hayır ☐
- Her gün et, balık veya beyaz et tüketiyor Evet ☐ Hayır ☐

0.0 = Eğer evet sayısı 0 veya 1 ise
0.5 = Eğer evet sayısı 2 ise
1.0 = Eğer evet sayısı 3 ise ☐.☐

L Her gün iki veya daha fazla porsiyon meyve veya sebze tüketiyor
0 = Hayır 1 = Evet ☐

M Her gün kaç bardak sıvı (su, meyve suyu, kahve, çay,süt, vb.) tüketiyor?
0.0 = 3 bardaktan az
0.5 = 3-5 bardak
1.0 = 5 bardaktan fazla ☐.☐

N Yemek yeme şekli nasıl?
0 = Yardımsız yemek yiyemiyor
1 = Güçlükle kendi kendine yemek yiyebiliyor ama zorlanıyor
2 = Sorunsuz bir biçimde kendi kendine yiyor ☐

O Beslenme durumu ile ilgili düşüncesi
0 = Kötü beslendiğini düşünüyor
1 = Kararsız
2 = Kendisini hiçbir beslenme sorunu olmayan bir kişi olarak görüyor ☐

P Aynı yaştaki kişilerle karşılaştırıldığında, sağlık durumunu nasıl değerlendiriyor?
0.0 = İyi değil
0.5 = Bilmiyor
1.0 = İyi
2.0 = Çok iyi ☐.☐

Q Kol çevresi (cm)
0.0 = 21'den az
0.5 = 21-22
1.0 = 22 veya daha fazla ☐.☐

R Baldır çevresi (cm)
0 = 31'den az
1 = 31 veya daha fazla ☐

Değerlendirme (en fazla 16 puan) ☐☐.☐
Tarama puanı ☐☐.☐
Toplam değerlendirme (en fazla 30 puan) ☐☐.☐

Ref. Vellas B, Villars H, Abellan G, et al. *Overview of MNA® - Its History and Challenges.* J Nut Health Aging 2006; 10: 456-465.
Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. Screening for Undernutrition in Geriatric Practice: *Developing the Short-Form Mini Nutritional Assessment (MNA-SF).* J. Geront 2001; 56A: M366-377.
Guigoz Y. The Mini-Nutritional Assessment (MNA®) *Review of the Literature – What does it tell us?* J Nutr Health Aging 2006; 10: 466-487.

Daha fazla bilgi için: www.mna-elderly.com

Malnutrisyon Gösterge Puanı

24 to 30 puan	☐	Normal nütrisyonel durum
17 to 23.5 puan	☐	Malnütrisyon riski altında
17 puandan aşağı	☐	Malnütrisyonlu

ANNEX 5: Reference Intervals For Biochemical Values

Biochemical Values	Classification
Albumin (g/dL)	
<3.5	Low
3.4-5.2	Normal
>5.2	High
Kreatinin (g/dL)	
<0.9	Low
0.9-1.3	Normal
>1.3	High

ANNEX 6: Curriculum Vitae

PERSONAL INFORMATION

Name	Aslıhan	**Surname**	YAĞCIOĞLU
Birth Place	İSTANBUL	**Birth Date**	15.07.1993
Nationality	Turkey	**Identification number**	36460692646
E-mail	aslihanyagcioglu@gmail.com	**Phone Number**	05321551793

EDUCATION

DEGREE	DEPARTMENT/COLLEGE	UNIVERSITY/INSTITUTION	DATE
Master	Nutrition and Dietetics	Yeditepe University	2018
License	Nutrition and Dietetics	Yeditepe University	2016

WORK EXPERIENCE

Statu	Hospital	Years
Dietitian	Koç University Hospital	2017-…

PLEASE INDICATE IF YOU HAVE ATTENDED GCP COURSE or CITI TRAINING

DATE	TITLE OF THE COURSE
February 2014	3. National Healthy Living Symposium, Sports Dietitian Course, *Acıbadem University*
June-July 2014	Boston Embassy English Language School
November 2014	Istanbul Biennial Nutrition and Health , *Public Health Agency of Turkey*
November 2014	EASO-Obesity Management Task Force Teaching Course , Turkish Foundation for Diabetes and Obesity
November 2014	VI. National Obesity Congress, *Turkish Foundation for Diabetes and Obesity*

November 2014	Bariatric Surgery Dietitian Course ,*Turkish Foundation for Diabetes and Obesity*
February 2015	4. National Healthy Living Symposium, from obesity to anorexia Eating Disorders, *Acıbadem University*
March 2016	Bariatric Surgery Course, *Acıbadem University*
March 2016	Carbohydrate Counting Course, *Acıbadem University*
March 2016	5. National Healthy Living Symposium, Current Topics in Nutrition and Dietetics, *Acıbadem University*
July 2016	European Obesity Summit, European Association for the Study of Obesity, Sweden
April 2018	54. Antalya National Diabetes Congress