ARAŞTIRMA / RESEARCH

Evaluation of Compliance of Clinical Nutrition Practices in with ESPEN Guidelines in Turkey

Türkiye'deki Klinik Nütrisyon Uygulamalarının ve ESPEN Rehberlerine Uyumunun Değerlendirilmesi

Sema ÇALAPKORUR , Hilal TOKLU BALOĞLU

Erciyes University Health Science Faculty Nutrition and Dietetic Department, Kayseri, Turkey

Geliş tarihi/Received: 08.06.2022
Kabul tarihi/Accepted: 14.03.2023

Sorumlu Yazar/Corresponding Author:

Sema ÇALAPKORUR, Assist Prof.
Erciyes University Faculty of Health Sciences, Köşk District, Kutadgu Bilig Street, Old Faculty Cluster Houses No:63 Melikgazi/KAYSERİ
E-posta: dyt_sema@hotmail.com
ORCID: 0000-0002-2540-1957

Hilal TOKLU BALOĞLU, Res. Assist.
ORCID: 0000-0002-0052-4838

This study was presented as a poster presentation at the "ESPEN 2021 Virtual Congress" on September 09-14,2021.

Abstract

Objective: This study was planned to assess clinical nutrition practices and compliance with ESPEN guidelines in Turkey.

Material and Method: The study was conducted on the online platform with 60 dieticians who were in the nutritional support team in different provinces of Turkey. The online form consists of sections on the particulars of the nutritional support team and an assessment of disease-specific nutrition practices.

Results: Dietitians' 60% stated that NST (Nutritional Support Team) in their institution had training in clinical nutrition. While all the participants stated that the Nutritional Risk Score (NRS-2002) was used in screening the nutritional status, 50% of the participants reported that anthropometric measurement practices were not carried out regularly. The rate of dietitians who stated that enteral nutrition was started in intensive care patients who were not expected to start full oral nutrition in the first 3 days was 71.7%. The rate of dietitians who stated that preoperative fasting was not applied in patients before surgery was 3.4%, while continued to be fed in the post-operative period was 10.5%. The rate of using combined therapy was 23.3% in patients who were neglected and who developed inflammatory stenosis in the intestines, applying for oral nutritional support in case of continued inflammation in the intestines was determined as 46.6%. The rate of using formulas containing whole protein in liver patients was 77%, and using formulas rich in branched-chain amino acids in patients with hepatic encephalopathy was 51.9%.

Conclusion: Nutritional support team professionals should focus on clinical nutrition education and increase their awareness of guideline recommendations.

Keywords: Clinical nutrition, nutritional support team, guidelines, nutrition practices, ESPEN.

Öz

Amaç: Bu çalışma, Türkiye'deki klinik beslenme uygulamalarının ve ESPEN rehberlerine uyumun değerlendirilmesi amacıyla planlanıp yürütülmüştür.

Gereç ve Yöntem: Çalışma, Türkiye'nin farklı illerinde beslenme destek ekibinde (BDE) yer alan 60 diyetisyen ile online platformda gerçekleştirilmiştir. Çevrimiçi form beslenme destek ekibinin özellikleri ve hastalıklara özgü beslenme uygulamalarının değerlendirilmesine yönelik bölümlerden oluşmuştur.

Bulgular: Diyetisyenlerin %60'ı kurumlarındaki BDE'nin klinik nütrisyona yönelik eğitimi olduğunu belirtmiştir. Bireylerin tamamı beslenme durumunun taranmasında Nütrisyonel Risk Skoru (NRS-2002)'nin kullanıldığını belirtirken, katılımcıların %50'si kurumlarında antropometrik ölçüm uygulamalarının düzenli olarak yapılmadığını ifade etmiştir. İlk 3 gün içinde ağızdan tam doz nütrisyona başlaması beklenmeyen yoğun bakım hastalarına enteral nütrisyon başlandığını ifade eden diyetisyenlerin oranı %71,7'dir. Cerrahi öncesi hastalara preoperatif açlık uygulamayan diyetisyenlerin oranı %3,4, postoperatif dönemde beslemeye devam ettiklerini belirten diyetisyenlerin oranı ise %10,5'tir. Bakımsız ve bağırsaklarında inflamatuar steanoz gelişen olgularda kombine terapi kullanılma oranı %23,3, bağırsaktaki inflamasyonun devamı halinde oral nutrisyon desteği yapılma oranı ise %46,6 olarak belirlenmiştir. Karaciğer hastalarında tam protein içeren formüllerin kullanım oranı %77, hepatik ensefalopati gelişen hastalarda dallı zincirli aminoasit (DZAA) lerden zengin formüllerin kullanılma oranı ise %51,9'dur.

Sonuç: Beslenme destek ekibi profesyonelleri klinik beslenme eğitimine odaklanmalı ve kılavuz önerileri konusunda farkındalıklarını artırmalıdır.

Anahtar Kelimeler: Klinik beslenme, kılavuzlar, beslenme destek ekibi, beslenme uygulamaları, ESPEN.

1. Introduction

Clinical nutrition is a discipline that targets patients individually, covers all preventive or therapeutic nutritional measures, and deals with the prevention, diagnosis, and management of disorders due to energy and nutrient deficiency and/or excess in acute and chronic diseases. While malnutrition, overweight, obesity, micronutrient abnormalities and refeeding syndrome are significant nutritional problems that should be assessed within the scope of clinical nutrition; sarcopenia and frailty are nutritional conditions with a complex and multiple pathogenic backgrounds (1).

Nutritional support teams (NST) in hospitals are responsible for controlling all aspects of nutritional care. Although the activities of the nutritional support team vary according to the particulars of the hospital and the available human resources, it focuses on developing institutional policies regarding malnutrition screening and appropriate nutritional care interventions, providing timely, safe, patient-specific, and cost-effective nutritional support therapy. In this context, NST makes positive contributions to reducing inappropriate parenteral and enteral nutrition practices and providing cost savings in addition to improving the nutritional status of patients with malnutrition (2, 3). Although these important benefits of the presence of a NST were reported, it is known that most hospitals still do not have NST (4). American Society for Parenteral and Enteral Nutrition (ASPEN) reported that 58% of the hospitals included in the ASPEN database did not have NST (3).

The NST is generally expected to include doctors, dietitians, nurses, pharmacists, and other health professionals (3). Dietitians are responsible for the assessment and screening of the patient's nutritional status, calculation of energy and nutrient requirements, determination, implementation and monitoring of the nutritional support route. Job descriptions of other health professionals are made similarly, and members are required to work in a multidisciplinary manner (5). In addition, the fact that this team has special training on nutritional support is accepted as an important indicator of the individual competence of members in this field (3).

It is recommended that clinical nutrition guidelines are used in determining and standardizing the organizational policies of the NST (5). In recent years, depending on the diversity of medical practices and the need to turn to evidence-based practices, various clinical management guidelines were published by different organizations (6). The enteral and parenteral nutrition guidelines published by the European Society for Clinical Parenteral and Enteral Nutrition (ESPEN) which is an international organization, are the first evidence-based European nutrition recommendations for adults. The purpose of ESPEN guidelines is assessing the evidence for nutrition in different indications and serving their use in clinical practice (6, 7). The degrees of evidence included in these guidelines are created depending on the quality, design, and consistency of the data in the literature on the subject. The highest level of A evidence indicates a recommendation based on at least one randomized controlled study, while the lowest level of C evidence indicates recommendations based on expert opinions (7).

It is suggested that clinical nutrition is a trending research topic in Turkey in recent years, while the necessity to support relevant education of health professionals was emphasized (8). In a study that aimed to define the current attitudes of Turkish surgeons towards nutritional screening and support, it was determined that the nutritional practices of surgeons who attend at least one scientific meeting on nutrition per year were more compatible with nutritional guidelines (9). In another study that aimed to evaluate nutritional support practices and related patient outcomes in intensive care units (ICU) in Turkey, the importance of nutritional support teams in providing timely and adequate management of nutritional support and its relationship with better patient outcomes was confirmed. In addition in this study, it was reported that with the increase in compliance with clinical nutrition guide recommendations, complications, need for ventilators and mortality would decrease (10). Although the literature data emphasizes the importance of NST activities and compliance with guidelines, it is still suggested that nutrition practices are insufficient due to a lack of knowledge and interest among doctors and nurses (8,10). No studies were found in Turkey on the practices of dietitians who play an important role in the NST. This study was planned and conducted to assess clinical nutrition practices and compliance with ESPEN guidelines in Turkey.

2. Material and Method

This descriptive study was conducted with dietitians working in the NST of hospitals in Turkey. At the beginning of the study, the contact information of hospitals in 81 provinces was recorded. The hospitals were contacted by phone and interviews were conducted with their dietitians, and they were inquired if NST was present in the hospital they were employed at. Dietitians working in the NST were informed about the study and their participation was requested. In this process, a total of 550 hospitals were called and the dieticians of 137 hospitals were contacted. The study was completed with 60 dietitians who took part in NST and agreed to participate in the study.

Study data were collected between April 2022 and June 2022. The questionnaire form which includes sections on the particulars of the NST and an assessment of the nutritional practices specific to diseases, was prepared on the online platform and the questionnaire link was sent to the dietitians via e-mail who agreed to participate in the study.

A total of 72 questions were asked to the participants in the questionnaire form. In the first part of the questionnaire, there were questions to get to know with the particulars of the institution and NST. In the second part nutrition recommendations in the ESPEN enteral and parenteral nutrition guidelines for intensive care, surgery, oncology, and gastrointestinal system diseases were given and the application status of these recommendations were inquired. Nutrition recommendations was taken from ESPEN guidelines that were translated into Turkish by the Society for Clinical Enteral and Parenteral Nutrition (KEPAN) to enable dietitians would understand the recommendation better (6, 7).

Participants were asked to mark these questions as yes, no, no idea and other. In case the answer other was given, it was stated that the different applications should be explained. Dietitians were told that if different dietitians work for different patient groups in their institutions, they can fill in the sections related to their colleagues working with these groups. In addition, if there is no specific patient group in their institution, they can skip the relevant section without answering.

The data obtained in the study were analyzed using SPSS (Statistical Package for Social Sciences) Windows 22.0. In this study, descriptive statistics were made. The answers given by the dietitians were analyzed as numbers and percentages.

3. Results

Dietitians 58.3% stated that they were working at a state hospital. While 60% of the dietitians stated that NSTs in their institutions had training for clinical nutrition, 75% stated that there was no training requirement for team selection. Dietitians 88.3% of those who participated in our study reported that their NST had a study guideline (Table 1).

All the participants stated that the NRS-2002 was used to screen the nutritional status; in addition to NRS-2002, 8.3% stated that Mini Nutritional Assessment (MNA) was used and 6.7% stated that Subjective Global Assessment (SGA) was used. Participants 50% of stated that anthropometric measurements were not carried out regularly and were made by nurses at a rate of 78%. In terms of determining the energy requirement, 70% of the participants noted that they used the energy per kg calculation, 60% used the Harris-Benedict equation, and 35% used the Schofield equation. It was observed that dietitians played an important role in the formula selection of the patients at a rate of 91.7%. 20% of the participants stated that in tube feeding practices, various foods such as soup, milk, ayran and compote were also delivered from the tube in addition to the enteral formula (Table 1).

Table 1. Information on the Characteristics of the Institution & Nutrition Support Team (NST) & General Nutrition Practices

CHARACTERISTICS OF THE INSTITUTION AND NST	n	%
Institution		
State hospital	35	58.3
City hospital	3	5
Faculty hospital	15	25
Private hospital	3	5
Training and research hospital	4	6.7
Does the NST have training on clinical nutrition?		
Yes	36	60
No	24	40
Is there a requirement for the personnel to be assigned in the NST to have a special training on clinical nutrition?		
Yes	15	25
No	45	75
Does the NST have operating instructions?		
Yes	53	88.3
No	7	11.7
Does your institution have a parenteral nutrition preparation unit?		
Yes	13	21.6
No	47	78.4
GENERAL NUTRITION PRACTICES	**n**	**%**
What is the screening tool used for malnutrition screening?*		
MUST	1	1.7
NRS-2002	60	100
MNA	5	8.3
SGA	4	6.7
Others (Waterlaw, SNAQ, a form specific to the hospital)	4	6.8

Table 1. Information on the Characteristics of the Institution & Nutrition Support Team (NST) & General Nutrition Practices (continue)

CHARACTERISTICS OF THE INSTITUTION AND NST	n	%
Which personnel apply the screening tool? *		
Nutritionist	32	53.3
Physician	12	20
Nurse	52	86.7
Which anthropometric measurements are applied to the patients? * (n=53)**		
Body weight	49	92.5
Height	46	86.8
Skinfold thickness	1	1.9
Waist circumference	1	1.9
Mid-upper-arm circumference	8	15.1
Anthropometric measurements are not made regularly.	30	50.0
Others (Knee length, calf circumference)	4	6.8
Which personnel perform anthropometric measurements? *		
Nutritionist	38	64.4
Nurse	46	78
Physician	1	1.7
Others (Measurements are not made)	2	3.4
How often are anthropometric measurements made?		
Everyday	1	1.7
Once a week	25	41.7
Two or three times a week	2	3.3
Anthropometric measurements are not made regularly.	30	50.0
Other (Measurements are not made)	2	3.3
Which method is used to calculate the energy requirement of the patients? *		
Energy calculation per kg (e.g. 20-25 kcal/kg)	42	70.0
Harris-benedict equation	36	60.0
Schofield equation	21	35.0
Mifflin St Jeor equation	1	1.7
In which cases is the energy requirement increased or decreased? (n=59)**		
Ventilation	44	74.6
Presence of malignant tumor	27	45.8
Severe infection	51	86.4
Fever	48	81.4
Use of sedative drugs	8	13.6
Surgical operation	49	83.1
Sepsis	44	74.6
Other (Trauma, burn)	6	10.2
Which personnel determine the product to be used in the patient? *		
Physician	48	80.0
Nurse	16	26.7
Nutritionist	55	91.7
Pharmacist	15	25.0
In tube feeding applications, is any food given through the tube other than the enteral product?		
Yes	12	20.0
No	43	71.7
No idea	5	8.3

**More than one option has been ticked. **Indicates the number of participants who answered the question.*

***Malnutrition Universal Screening Tool (MUST), Nutritional Risk Score (NRS-2002), Subjective Global Assessment (SGA), Short Nutritional Assessment Questionnaire (SNAQ)*

The rate of dietitians who stated that intensive care patients who were not expected to start full oral nutrition in the first 3 days were started enteral nutrition was 71.7%. The application rate of the C level recommendation 'enteral nutrition should be administered up to 25-30 kcal/kgBW/day in patients with severe malnutrition, and if these target values cannot be reached, should be switched to additional parenteral nutrition' was determined as 73.3%. The rate of preference for immunomodulating formulas over standard formulas was 26.8% in patients undergoing elective upper gastrointestinal surgery, 53.7% in trauma patients, and 63.4% in burn patients. Glutamine supplementation was performed in 64.0% of burn patients and 48% of trauma patients. Dietitians of 86.7% noted that patients who were not expected to switch to normal nutrition within 3 days, who had enteral nutrition (EN) contraindicated within 24-48 hours, or all patients who could not tolerate normal nutrition were fed with parenteral nutrition (PN), and 66.7% of dietitians mentioned using formulations that met all their requirements for such patients (Table 2).

Table 2. Evaluation of the Compliance of Nutrition Practices in Intensive Care Patients with ESPEN Guidelines

ESPEN recommendation	**Level of Evidence**		
All patients who are not expected to be on a full oral diet within 3 days should receive EN		**C**	
Implementation Status of the Recommendation		**n**	**%**
Yes		43	71.7
No		12	20.0
No idea		1	1.6
Other (This is decided according to the patient's clinical condition)		4	6.7
Patients with a severe undernutrition should receive EN up 25–30 total kcal/kg BW/day. If these target values are not reached supplementary parenteral nutrition should be given		**C**	
Yes		44	73.3
No		11	18.3
No idea		2	3.4
Other (This is decided according to the patient's clinical condition)		3	5
Whole protein formulas should be used in most intensive care patients. (n=59)**		**C**	
Yes		35	59.3
No		17	28.8
No idea		2	3.4
Other (This is decided according to the patient's clinical condition)		5	8.5
"Immune-modulating formulae (formulae enriched with arginine, nucleotides and Ω-3 fatty acids) are superior to standard enteral formulae (n=41)**			
	Level of Evidence	**n**	**%**
In elective upper GI surgical patients	**A**	11	26.8
In patients with a mild sepsis (APACHE II < 15)	**B**	4	9.8
In patients with severe sepsis, however, immune-modulating formulae may be harmful and are therefore not recommended	**B**	21	51.2
In patients with trauma	**A**	22	53.7
In patients with ARDS	**B**	7	17.1
In burned patients	**A**	26	63.4
Immune modulating products are not used.		12	22.6
No idea		4	6.9
Other (Oncology patients, covid patients)		6	10

Table 2. Evaluation of the Compliance of Nutrition Practices in Intensive Care Patients with ESPEN Guidelines (continue)

ESPEN recommendation	**Level of Evidence**	**n**	**%**
In which situations is glutamine added to enteral nutrition in intensive care patients? * (n=50)**			
Burned patients	**A**	32	64
Trauma patients	A	24	48
There are not sufficient data to support glutamine supplementation in surgical or heterogenous critically ill patients		11	22
Glutamine is not added.		8	14.5
No idea.		3	5.2
Others (Covid, major surgery, bedsores)		13	21.7
All patients who are not expected to be on normal nutrition within 3 days should receive PN within 24–48 h if EN is contraindicated or if they cannot tolerate EN.		**C**	
Yes		52	86.7
No		3	5
No idea		1	1.6
Other (This is decided according to the patient's clinical condition)		4	6.7
ICU patients receiving PN should receive a complete formulation to cover their needs fully		**C**	
Yes		40	66.7
No		14	23.3
No idea		2	3.3
Other (This is decided according to the patient's clinical condition)		4	6.7
When PN is indicated in ICU patients the amino acid solution should contain L-glutamine (n=57)**		**A**	
Yes		22	38.6
No		17	29.8
No idea		16	28.1
Other (This is decided according to the patient's clinical condition)		2	3.5
All PN prescriptions should include a daily dose of multivitamins and of trace elements (n=58)**		**C**	
Yes		23	39.7
No		24	41.4
No idea		6	10.3
Other (It is added to the ready-to-use PN or it contains multivitamins, but no trace elements)		5	8.6
Which ones are used as intravenous lipid emulsions? ** (n=50)**			
	Level of Evidence	**n**	**%**
LCT, MCT or mixed emulsions	**B**	24	48
Soybean LCT	**C**	9	18
EPA and DHA added lipid solutions	**B**	22	44
Solutions containing soybean oil and olive oil	**B**	31	62
No idea		7	12.5
Other (This is decided according to the patient's clinical condition)		2	3.3

**More than one option has been ticked. **Indicates the number of participants who answered the question.*

Enteral Nutrition (EN), Parenteral Nutrition (PN), Long chain triglycerides (LCT), medium chain triglycerides (MCT), Eikasopentaoenic acid (EPA), Docosahexaenoic acid (DHA).

The rate of implementation of the recommendation 'Perioperative fasting should not be practiced' in surgical patients was determined as 3.4%. The rate of dietitians who stated that they continued with nourishment in the post-operative period was 10.5%. The rate of those

who apply for nutritional support before major surgery in patients with severe nutritional risk was 38.4%, and those who apply preoperative enteral nutrition to risky patients before hospitalization was 13.3%. The use of perioperative immune modulating agents was determined to be 45% in patients undergoing major cancer neck surgery and 25% in those that experience severe trauma. 28.8% of dietitians stated that patients were given carbohydrates before surgery (Table 3).

Table 3. Evaluation of Compliance of Nutritional Practices in Surgical Patients with ESPEN Guidelines

ESPEN recommendation	Level of Evidence		
How long is the perioperative fasting period applied in your hospital?? (n=59)**		**A**	
Implementation Status of the Recommendation		**n**	**%**
24 hours		39	66.1
48 hours		4	6.8
Perioperative fasting is not practiced (A level of evidence)		2	3.4
Other (6-8 hours, 8-12 hours, 10-12 hours, 12 hours, 12-16 hours)		14	23.7
When does post-operative nutrition start in your hospital? (n=57)**		**A**	
Nutrition is not interrupted after surgery* (A level of evidence)		6	10.5
Postoperative 24th Hour		32	56.1
Postoperative 36th Hour		3	5.3
Postoperative 48th hour		1	1.8
Other (3 hours, 4-6 hours, 6 hours, 4-8 hours, 8 hours, 8-10 hours, postoperative 5th day, postoperative 6th day)		15	26.3
Use nutritional support in patients with severe nutritional risk for 10–14 days prior to major surgery		**A**	
Yes		23	38.4
No		21	35.0
No idea		14	23.3
Other (This is decided according to the patient's clinical condition)		2	3.3
Preoperative EN should preferably be administered before admission to the hospital		**C**	
Yes		8	13.3
No		36	60.0
No idea		13	21.7
Other (This is decided according to the patient's clinical condition)		3	5.0
Regardless of the nutritional risk, in which patient groups are perioperative immune-modulating products used for enteral nutrition? *			
	Level of evidence	**n**	**%**
Patients undergoing major neck surgery for cancer	A	27	45.0
Patients undergoing major abdominal cancer surgery	**A**	22	36.7
After severe trauma	**A**	15	25.0
Immune modulating products are not used.		13	21.0
No idea		15	25.0
Other (Bedsores)		2	3.4
Preoperative carbohydrate loading using the oral route is recommended in most patients. In the rare patients who cannot eat or are not allowed to drink preoperatively for whatever reasons the intravenous route can be used (n=59)**		**A**	
Yes		17	28.8
No		17	28.8
No idea		23	39.0
Other (It is rarely applied)		2	3.4

Table 3. Evaluation of Compliance of Nutritional Practices in Surgical Patients with ESPEN Guidelines (continue)

ESPEN recommendation	Level of Evidence	
All components of parenteral nutrition should be administered as a mixture and finished within 24 hours.	**A**	
Implementation Status of the Recommendation	**n**	**%**
Yes	51	85.0
No	4	6.7
No idea	1	1.6
Other (Ready-to-use products are used)	4	6.7
After surgery, in those patients who are unable to be fed via the enteral route, and in whom total or near total parenteral nutrition is required, a full range of vitamins and trace elements should be supplemented on a daily basis.	**C**	
Yes	41	68.3
No	7	11.7
No idea	8	13.3
Other (Only vitamin supplements are given.)	4	6.7
Parenteral nutrition should be gradually tapered off and stopped	**A**	
Yes	43	71.7
No	13	21.7
No idea	4	6.6

**More than one option has been ticked.*
***Indicates the number of participants who answered the question.*

If oncology patients have malnutrition or will not be able to eat for >7 days, the rate of dietitians those who start nutritional therapy was 96.4%, and who start EN if insufficient food intake was expected was 94.4%. 34.6% of the dietitians stated that they used standard products in such patients, and 16.7% stated that perioperative immune-modulating EN was preferred in those who would undergo surgery. In addition, 59.3% of dietitians stated that no special formulation was used in patients who needed short-term PN, while 29.6% stated that a higher lipid percentage was used in cachexia patients who needed long-term PN. 72.2% of dietitians stated that the belief that PN should not be applied because it provides nutrients to the tumor was not true (Table 4).

Table 4. Evaluation of Compliance of Nutritional Practices in Oncology Patients with ESPEN Guidelines

ESPEN recommendation	Level of Evidence	
Start nutritional therapy if undernutrition already exists or if it is anticipated that the patient will be unable to eat for >7 days (n*=55)	**C**	
Implementation Status of the Recommendation	**n**	**%**
Yes	53	96.4
No idea	1	1.8
Other	1	1.8
Start enteral nutrition if an inadequate food intake (<60%of estimated energy expenditure for >10 days) is anticipated. (n*=54)	**C**	
Yes	51	94.4
No	2	3.7
No idea	0	0
Other	1	1.9
During radio or radio-chemotherapy: Use intensive dietary advice and oral nutritional supplements to increase dietary intake and to prevent therapy-associated weight loss and interruption of radiation therapy. (n*=53)	**A**	
Yes	33	62.3
No	7	13.2
No idea	9	17
Other	4	7.5

Table 4. Evaluation of Compliance of Nutritional Practices in Oncology Patients with ESPEN Guidelines (continue)

ESPEN recommendation		Level of Evidence
Standard formulae should be used in oncology patients. (n*=52)		**C**
Implementation Status of the Recommendation	**n**	**%**
Yes	18	34.6
No	16	30.8
No idea	4	7.7
Other	14	26.9
Use preoperative enteral nutrition preferably with immune modulating substrates for 5–7 d in all patients undergoing major abdominal surgery independent of their nutritional status (n*=54)		**A**
Yes	9	16.7
No	28	51.8
No idea	14	25.9
Other	3	5.6
PN is recommended in patients with severe mucositis or severe radiation enteritis. (n*=53)		**C**
Yes	36	67.9
No	5	9.4
No idea	12	22.7
Special formulations should not be used in patients who require short-term parenteral nutrition. (n*=54)		**C**
Yes	32	59.3
No	14	25.9
No idea	8	14.8
Using a higher than usual percentage of lipid may be beneficial for those with frank cachexia needing prolonged PN (n*=54)		**C**
Yes	16	29.6
No	23	42.6
No idea	10	18.5
Other	5	9.3
Although PN supplies nutrients to the tumor, there is no evidence that this has deleterious effects on the outcome. This consideration should therefore have no influence on the decision to feed a cancer patient when PN is clinically indicated. (n*=54)		**C**
Yes	39	72.2
No	1	1.9
No idea	13	24.0
Other	1	1.9

* Indicates the number of participants who answered the question.

The rate of use of combined therapy was 23.3% in patients who had inflammatory stenosis in the intestines and oral nutritional support in case of continued inflammation in the intestines was determined to be 46.6%. The rate of dietitians who stated that perioperative nutrition was applied in cases with preoperative weight loss and low albumin levels were 53.3%. In the case of short bowel syndrome, the rate of administration of PN to ensure fluid electrolyte replacement and adequate nutrient intake was 43.3%. Dietitians of 51.6% stated that they used SGA as a screening test in these patients (Table 5).

While the rate of dietitians who stated that the energy need was calculated as 25-30 kcal/kg/day in patients with alcoholic fatty liver disease and cirrhosis was 53.9%, who calculated the protein requirement of such patients as 1.2-1.5 g/kg/day was 56.9%. The rate of those who prefer percutaneous endoscopic gastrostomy (PEG), which was not recommended in tube feeding, was 23.1%. The rate of use of formulas containing whole protein in these patients was 77%, and the use of formulas rich in branched-chain amino acids (BCAA) in patients with hepatic encephalopathy was 51.9% (Table 5).

Table 5. Evaluation of Compliance of Nutritional Practices in Gastrointestinal System Patients with ESPEN Guidelines

ESPEN recommendation		Level of Evidence
GASTROINTESTINAL DISEASES		
Use combined therapy (enteral nutrition and drugs) in undernourished patients as well as in patients with inflammatory stenosis of the intestine		**C**
Implementation Status of the Recommendation	**n**	**%**
Yes	14	23.3
No	13	21.6
No idea	32	53.3
Other	1	1.6
In case of persistent intestinal inflammation (e.g. steroid dependent patients) use oral nutritional supplements		**B**
Yes	28	46.6
No	9	15
No idea	23	38.3
Use peri-operative nutrition in patients with weight loss prior to surgery and low albumin.		**C**
Yes	32	53.3
No	9	15
No idea	18	30
Other	1	1.6
Bowel rest has not been proven to be more efficacious than nutrition per se. (n*=53)		**C**
Yes	23	35
No	8	13.3
No idea	20	48.3
Other	2	3.3
Parenteral nutrition is usually combined with oral/enteral food unless there is continuing intra-abdominal sepsis or perforation.		**B**
Yes	41	68.3
No	3	5
No idea	16	26.6
In short bowel syndrome; to ensure fluid electrolyte replacement and adequate nutrient intake, parenteral nutrition must be administered.		**B**
Yes	26	43.3
No	9	15
No idea	22	36.6
Other	3	5
In short bowel syndrome; increasing adaptation should be achieved with enteral nutrition products as a supplement to normal foods.		**C**
Yes	34	56.6
No	3	5
No idea	20	33.3
Other	3	5
Subjective global assessment (SGA) should be used to identify patients at risk of undernutrition.		**C**
Yes	31	51.6
No	18	30
No idea	10	16.6
Other	1	1.6
LIVER DISEASES		
How is the energy need determined in patients with alcoholic fatty liver disease and liver cirrhosis? (n*=52)		**C**
35-40 kcal/kg/day (C level of evidence)	13	25
25-30 kcal/kg/day	28	53.9
20-25 kcal/kg/day	7	13.5
No idea	2	3.8
How is the protein requirement determined in patients with alcoholic fatty liver disease and liver cirrhosis? (n*=51)		**C**
1-1.2 g/kg/day	13	25.5
1.2-1.5 g/kg/day (C level of evidence)	29	56.9
2-2.5 g/kg/day	2	3.9
No idea	2	3.9
Other	5	9.8

Table 5. Evaluation of Compliance of Nutritional Practices in Gastrointestinal System Patients with ESPEN Guidelines (Continue)

ESPEN recommendation	Level of Evidence	
LIVER DISEASES		
If patients are not able to maintain adequate oral intake from normal food, use tube feeding. (n*=52)	**A**	
Implementation Status of the Recommendation	**n**	**%**
Yes	45	86.6
No	5	9.6
No idea	1	1.9
Other	1	1.9
PEG placement is associated with a higher risk of complications and is not recommended. (n*=52)	**C**	
Yes	28	53.8
No	12	23.1
No idea	1	1.9
Other	11	21.2
Whole protein formulae are generally recommended. (n*=52)	**C**	
Yes	40	77
No	8	15.4
No idea	2	3.8
Other	2	3.8
Consider using more concentrated high-energy formulae in patients with ascites. (n*=51)	**C**	
Yes	21	41.2
No	12	23.5
No idea	16	31.4
Other	2	3.9
Use branched-chain amino acid (BCAA) enriched formulae in patients with hepatic encephalopathy arising during enteral nutrition. (n*=52)	**A**	
Yes	27	51.9
No	10	19.2
No idea	11	21.2
Other	4	7.7
Start PN immediately in moderately or severely malnourished alcoholic steatohepatitis patients, who cannot be fed sufficiently either orally or enterally. (n*=52)	**A**	
Yes	24	46.2
No	15	28.8
No idea	11	21.2
Other	2	3.8
Give PN when the fasting period lasts longer than 72 h. (n*=52)	**C**	
Yes	40	76.9
No	7	13.5
No idea	5	9.6
Oil emulsions with low n-6 unsaturated fatty acid content should be used. (n*=51)	**C**	
Yes	27	53
No	9	17.6
No idea	13	25.5
Other	2	3.9
In alcoholic liver disease, administer vitamin B1 prior to starting glucose infusion to reduce the risk of Wernicke's encephalopathy. (n*=51)	**C**	
Yes	18	35.3
No	6	11.8
No idea	25	49
Other	2	3.9

** Indicates the number of participants who answered the question.*

4. Discussion

In this study, compliance with ESPEN guideline recommendations in clinical nutrition practices and clinical nutrition practices of various diseases in Turkey was investigated. Nutritional support teams in hospitals play an important role in the prevention and/or treatment process of malnutrition in patients by determining appropriate nutritional interventions. Multidisciplinary teamwork is required to determine, implement, and monitor the appropriate nutritional therapy for patients. In this context, the person who will work in this team must have training in clinical nutrition (11). In this study, 60% of dietitians stated that NST staff had training in clinical nutrition.

Nutritional screening is the first step to assess the nutritional status of patients and making appropriate nutritional interventions. For this purpose, valid and reliable nutritional screening tools are needed (12). Although there are many screening tools to determine nutritional risk, ESPEN guidelines recommend the use of NRS-2002 in hospitalized patients, the Malnutrition Universal Screening Tool (MUST) in adults, and the MNA in the elderly (1). In this study, all the participants stated that the NRS-2002 was used to screen the nutritional status while MNA and SGA were mostly preferred to supplement NRS-2002. Although it is recommended that these screening tests would be applied by dietitians (12), 86.7% of the dietitians participating in this study stated that nurses applied these forms. In addition, it was determined that 53.3% of the dietitians applied the forms.

Regularly taking anthropometric measurements of patients is a necessary step for the correct planning of nutritional support therapy (13). Despite this, 50% of the dietitians in this study stated that anthropometric measurements of the patients were not performed regularly. In addition, although it is recommended not to give food other than enteral products through the tube due to the risk of clogging in tube feeding practices (7), 20% of the participants stated that various foods such as soup, milk, buttermilk, and compote were given to the patient through the feeding tube.

Patients in the ICU have a high risk of developing malnutrition, which is associated with adverse clinical outcomes such as increased risk of infection, prolonged stay in the intensive care unit, and mechanical ventilation. In this context, the ESPEN guides recommended initiating enteral nutrition early on in hemodynamically stable patients and applying additional parenteral nutrition therapy in patients whose energy and nutrient needs cannot be met (6,7,14,15). In this study, it was observed that the rate of implementation of these recommendations was 70% on average. In addition, it is emphasized that in intensive care patients, immuno-nutrition is effective in preventing the development of local and systemic inflammation in patients with changes in the stress response due to cytokines, protection of mucosal barrier function and cellular defense function, increasing survival (16,17). In addition, it is known that the intramuscular concentration of glutamine, which plays an important role in the protection of intestinal mucosal integrity and regulation of the inflammatory response, decreases rapidly in hypercatabolic and hypermetabolic conditions (17). In this direction, ESPEN guidelines recommend that

immune-modulating formulas should be preferred to standard products in some patient groups (6,7). In this study, the rate of preference for immune-modulating formulas over standard products was 26.8% in patients undergoing elective upper gastrointestinal surgery, 53.7% in trauma patients, and 63.4% in burn patients. The rate of adding glutamine was 64% in burn patients, 48% in trauma patients, and 38.6% in patients with PN indications. These results reveal that awareness of immuno-nutrition should be increased in intensive care patients.

It was reported that the application of evidence-based practices in surgical patients can accelerate post-surgical recovery and reduce surgery-related mortality. Enhanced Recovery After Surgery (ERAS) protocol that emerged to that aim includes nutritional recommendations such as minimizing nighttime hunger, ensuring early feeding and using carbohydrate-containing fluids (18).

It was reported that anesthesia administered during the pre-operation period suppresses cough and swallowing reflexes, therefore, it is considered that reducing stomach content before surgery is important for patient safety. However, although there is insufficient evidence to support this practice, patients have fasted for 12 hours or more before surgery. In surgery patients, long-term fasting before surgery not only deprives patients of nutrition and hydration, but also causes an increase in catabolic pathways that may increase the risk of post-operative complications, and a decrease in lean body mass (19). In addition, there is no evidence proving that 2-3 hours of short-time fasting containing clear or carbohydrate-rich liquids compared to long-term fasting would cause an increase in the risk of aspiration, regurgitation and morbidity associated with these symptoms (18,19). In light of all these data, the importance of the recommendation "Perioperative fasting should not be applied" recommended by ESPEN at evidence level A, comes forward, but the rate of implementation of this recommendation is reported to be only 3.4% in this study. In addition, the increase in the post-operative fasting period also causes similar clinical results and the recommendation of "Nutrition after surgery is not interrupted" by ESPEN is given at evidence level A (7,19). However, the rate of dietitians who stated that they continued to nourish patients in the post-operative period was 10.5% in our study.

Another important component of the ERAS protocol is oral carbohydrate loading. Consumption of carbohydrate-containing beverages until 2 hours before the surgery is also known as an effective way to reduce insulin resistance, minimize protein losses, reduce hospital stays and improve patient comfort. The fact that it provides all these effects without adversely affecting gastric emptying shows that this application is a reliable method (20,21). In our study, 28.3% of dietitians stated that patients were given carbohydrates before surgery. All these results show that nutritional awareness should be increased in the perioperative process in surgical patients and dietitians working in this field should be given training on the subject.

Malnutrition affects a significant portion of oncology patients, and proper nutrition therapy determines the effectiveness and success of cancer treatment in these patients. In these patients, nutritional support therapy should be included in routine treatment as part of their medical treatment (22). In this study, dietitians had high awareness of this issue and oncology patients were being provided early nutritional support. In addition, no clinical data is showing that the proliferation of tumors is accelerated and the risk of disease progression of nutritional support therapy. It is known that hunger does not stop cancer progression, on the contrary, it was significantly reduced the performance status of patients (22). In this study, 72.2% of the dietitians stated that the belief that PN should not be applied because it provides nutrients to the tumor was not true.

Oncology patients may benefit from immuno-nutrition due to their suppressed immune system. It was reported that immunonutrition reduces the risk of postoperative complications and shortens the length of hospital stay in oncology patients who would undergo surgery (23). However, in this study, the rate of implementation of ESPEN's recommendation on this subject was insufficient and only 16.7% of dietitians preferred perioperative EN containing immune modulating agents in patients undergoing surgery.

Prevention of malnutrition in individuals with intestinal diseases provides an improvement in clinical results and an increase in the quality of life of patients. In this context, it is necessary to identify risky patients by using appropriate screening tools and to start nutritional support with appropriate nutrition routes. Oral nutritional supplements or tube EN therapy in these patients aims to preserve their nutritional status. Parenteral nutrition is recommended in cases where oral or enteral support is insufficient and in patients with short bowel syndrome characterized by severe deterioration in nutrient absorption (24). In this study, the rate of use of combined therapy was determined as 23.3% in patients with inflammatory stenosis. In the case of short bowel syndrome, the rate of administration of PN to ensure fluid electrolyte replacement and adequate nutrient intake is 43.3%. Although the implementation levels of the recommendations vary, the fact that almost half of the dietitians participating in the study do not follow these recommendations shows that this issue should be included as an important part of clinical nutrition training.

Metabolic disorders such as hypercatabolism and proteolysis in liver diseases cause an increase in energy and protein requirements (25). However, the ratio of dietitians who applied the energy and protein calculation recommended by ESPEN in this study was 50% on average. It has been reported that percutaneous endoscopic gastrostomy (PEG) should not be preferred in these patients due to complications such as increased bleeding risk, leakage, and peritonitis (7,25). Despite this, 23.3% of the dietitians in this study stated that they preferred PEG application in liver patients.

In addition, it was reported that there is a decrease in the level of BCAA in patients with cirrhosis, which increases the susceptibility to sarcopenia and hepatic encephalopathy. It is known that oral nutrition supplemented with branched-chain amino acids has positive effects on nutritional parameters and quality of life (20). In this study, the rate of using formulas rich in BCAAs in patients with hepatic encephalopathy was determined to be 51.9% and it was thought that necessary warnings should be given to dietitians in this regard.

5. Conclusion and Recommendations

As a result of this study, it is considered that the awareness of dietitians working in the nutrition team about clinical nutrition guidelines should be increased. In this regard, it is recommended that the personnel who will take part in the nutrition team receive special training on clinical nutrition and information should be kept up to date with continuous training. In addition, it is considered that with the preparation of clinical nutrition guidelines specific to Turkey, the difficulties experienced by healthcare professionals in understanding, conceptualizing, and applying the guidelines would be eliminated.

6. Contribution to the Field

Clinical nutrition is an important area in the prevention of malnutrition and health expenditures. The ESPEN guidelines offer a wide variety of recommendations for clinical nutrition-related practice. Through this study, a contribution has been made to the field by presenting information to healthcare professionals about how clinical nutrition practices are performed and how these practices are compatible with ESPEN guidelines.

Ethical Aspects of the Research

The research was carried out by obtaining online consent from all participants and information was presented at the beginning of the survey. All procedures were carried out in accordance with ethical rules and the 1964 Helsinki declaration. The study protocol was approved by the Erciyes University Clinical Research Ethics Committee (Approval date and no: 06.04.2022- 2022/294).

Conflict of Interest

This article did not receive any financial fund. There is no conflict of interest regarding any person and/or institution.

Authorship Contribution

Concept: SÇ; **Design:** SÇ; **Supervision:** SÇ, HTB; **Funding:** SÇ, HTB; **Materials:** SÇ, HTB; **Data Collection/Processing:** SÇ, HTB; **Analysis/Interpretation:** SÇ, HTB; **Literature Review:** SÇ, HTB; **Manuscript Writing:** SÇ; **Critical Review:** SÇ, HTB.

References

1. Cederholm T, Barazzoni R, Austin P, Ballmer P, Biolo G, Bischoff SC, et al. ESPEN guidelines on definitions and terminology of clinical nutrition. Clin Nutr. 2017 Feb;36(1):49-64.

2. Mistiaen P, Van den Heede K. Nutrition Support Teams: A Systematic Review. JPEN J Parenter Enteral Nutr. 2020 Aug;44(6):1004-20.

3. DeLegge M, Wooley JA, Guenter P, Wright S, Brill J, Andris D, et al. The state of nutrition support teams and update on current models for providing nutrition support therapy to patients. Nutr Clin Pract. 2010 Feb;25(1):76-84.

4. Gonzalez-Granda A, Schollenberger A, Thorsteinsson R, Haap M, Bischoff SC. Impact of an interdisciplinary nutrition support team (NST) on the clinical outcome of critically ill patients. A pre/post NST intervention study. Clin Nutr ESPEN. 2021 Oct;45:486-91.

5. Nightingale J. Nutrition support teams: how they work, are set up and maintained. Frontline Gastroenterol. 2010 Oct;1(3):171-7.

6. Klinik Enteral Parenteral Nütrisyon Derneği. ESPEN Parenteral Nütrisyon Rehberi. Ankara; 2011. Available from: http://www.kepan.org.tr/userfiles/ESPEN_PN_KILAVUZ/ESPEN_PN_rehber_Turkce.pdf Erişim tarihi: 28 Mayıs 2022

7. Klinik Enteral Parenteral Nütrisyon Derneği. ESPEN Enteral Nütrisyon Rehberi. Ankara; 2012. Available from: http://www.kepan.org.tr/userfiles/ESPEN_EN_KILAVUZ/ESPEN_EN_KILAVUZ_Turkce.pdf Erişim tarihi: 28 Mayıs 2022

8. Demirkan K, Gündoğdu H, Uyar M, Kılıçturgay S, Demirağ K, Abbasoğlu O. The trending topic of specialty in Turkey: Clinical nutrition. Clin Sci Nutr. 2020 Apr;2(1):43-8.

9. Bozkırlı BO, Gündoğdu RH, Akbaba S, Sayın T, Ersoy PE. Surgeons' approach toward clinical nutrition: A survey based study. Turk J Surg. 2017 Sep 1;33(3):147-52.

10. Demirağ K, Kılıçturgay S, Hopancı Bıçaklı D, Sungurtekin H, Demirkan K, Gündüz M, et al. Nutritional support practices among intensive care units in Turkey: One-day cross-sectional study. Clin Sci Nutr. 2019;1(3):123-8.

11. Bhagavatula M, Tuthill D. The role of a hospital Nutrition Support Team. Paediatr Child Health. 2011;21(9):389-93.

12. Skipper A, Ferguson M, Thompson K, Castellanos VH, Porcari J. Nutrition screening tools: An analysis of the evidence. JPEN J Parenter Enteral Nutr. 2012 May;36(3):292-8.

13. van Bokhorst-de van der Schueren MAE, Guaitoli PR, Jansma EP, de Vet HCW. Nutrition screening tools: Does one size fit all? A systematic review of screening tools for the hospital setting. Clin Nutr. 2014 Feb;33(1):39-58.

14. Hoffmann M, Schwarz CM, Fürst S, Starchl C, Lobmeyr E, Sendlhofer G, et al. Risks in management of enteral nutrition in intensive care units: a literature review and narrative synthesis. Nutrients. 2021 Dec;13(1):82.

15. Pradelli L, Graf S, Pichard C, Berger MM. Supplemental parenteral nutrition in intensive care patients: A cost saving strategy. Clin Nutr. 2018 Apr;37(2):573-9.

16. Çelik F, Edipoğlu İS. Yoğun bakım hastalarında erken enteral immünonütrisyon uygulamasının enflamatuvar yanıta etkisi. Turk J Intensive Care 2019;17:88-95

17. McCarthy MS, Martindale RG. Immunonutrition in critical illness: What is the role? Nutr Clin Pract. 2018 Jun;33(3):348-58.

18. Robinson LA, Tanvetyanon T, Grubbs D, Robinson NA, Pierce CM, McCarthy K, et al. Preoperative nutrition-enhanced recovery after surgery protocol for thoracic neoplasms. J Thorac Cardiovasc Surg. 2021 Sep;162(3):710-20.

19. Sarin A, Chen LL, Wick EC. Enhanced recovery after surgery-Preoperative fasting and glucose loading-A review. J Surg Oncol. 2017 Oct;116(5):578-82.

20. Bilku DK, Dennison AR, Hall TC, Metcalfe MS, Garcea G. Role of preoperative carbohydrate loading: a systematic review. Ann R Coll Surg Engl. 2014 Jan;96(1):15-22.

21. Kratzing C. Pre-operative nutrition and carbohydrate loading. Proc Nutr Soc. 2011 Aug;70(3):311-5.

22. Kłęk S, Jankowski M, Kruszewski WJ, Fijuth J, Kapała A, Kabata P, et al. Clinical nutrition in oncology: Polish recommendations. Oncol Clin Pract. 2015;11(4):173-90.

23. Yu K, Zheng X, Wang G, Liu M, Li Y, Yu P, et al. Immunonutrition vs Standard Nutrition for Cancer Patients: A Systematic Review and Meta-Analysis (Part 1). JPEN J Parenter Enteral Nutr. 2020 Jul;44(5):742-67.

24. Balestrieri P, Ribolsi M, Guarino MPL, Emerenziani S, Altomare A, Cicala M. Nutritional Aspects in Inflammatory Bowel Diseases. Nutrients. 2020 Jan;12(2):372-83.

25. Palmer LB, Kuftinec G, Pearlman M, Green CH. Nutrition in cirrhosis. Curr Gastroenterol Rep. 2019 Jul;21(8):38.