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Research article

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Nurses' assessment of nutrition awareness in the critical patient

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Ethical approval date and numbered 07/13/2021, 2012-KAEK-15/2345 was taken from Kecioren Training and Research Hospital Clinical Research Ethics Committee.
All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

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Abstract

Background/Aim: Healthcare professionals need sufficient knowledge and practice regarding nutrition in terms of early diagnosis and treatment of malnutrition. This study aims to investigate and evaluate nurses' awareness and knowledge of nutrition among critical patients.
Methods: In this cross-sectional study, the knowledge levels of the nurses (n: 55) who have worked for at least two months in the intensive care or palliative service were measured using the Nurses' Nutrition Support Awareness Questionnaire for the Critical Patient, and the answers were statistically evaluated and interpreted.
Results: Nurses' average age was 27.7 and 21.8% of them were men and 78.2% were women. In terms of education status, 16% of them were high school graduates, 33% had associate degrees and 51% were university graduates. In addition, 76% of the nurses had more than two years of professional experience. According to the rate of correct answers in the questionnaire, the level of knowledge about starting nutritional support with the evaluation of the patient, the way and route of TPN administration, and the products and drugs that can be given together were evaluated as "good" with scores of 80-84%. The level of knowledge about the time to start support for the patient with insufficient oral intake, which products were preferred initially, the way to administer enteral products, and the duration of consumption were evaluated as "medium" with 60-65%. Nurses scored 40-50% on fluid support and feeding the patient without swallowing reflex, which was deemed "insufficient."
Conclusion: This study reveals that nurses have sufficient knowledge about the necessity of nutritional support and TPN. In addition, it indicates that the level of knowledge about enteral nutrition, fluid support, and nutrition of patients who do not have a swallowing reflex need to be supported by theoretical and practical training.

Keywords: Malnutrition, Enteral nutrition, Parenteral nutrition, Nurse

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Introduction

Nutrition is the maintenance of tissue and organ functions and adequate intake of all necessary nutrients for growth and regeneration [1]. Malnutrition causes complications, such as growth retardation, delay in wound healing, suppression of the immune system, the loss of skeletal muscle mass, atrophy of the intestinal mucosa, widespread edema, and decline in cognitive functions. Due to malnutrition, hospital stay, morbidity and mortality are also increasing [2, 3].

Healthcare professionals need to have sufficient knowledge and practice regarding nutrition in terms of early diagnosis and treatment of malnutrition. Nurses are in an ideal position to determine the nutritional status of the patient first and best, as they are the healthcare workers who first accept the hospitalized patient and perform daily follow-up and care. In a study conducted on this subject, 86% of nurses stated that nurses focused on nutritional problems in the clinics in which they worked, and 27% reported that doctors had this responsibility [4].

Nutrition of patients in palliative services and intensive care units should be a priority as much as treatment. Having sufficient knowledge and interest in nutrition of all healthcare personnel will reduce costs, as it will help patients recover faster and with fewer complications [5, 6].

This study is aimed at evaluating the knowledge, opinions, and perceptions of nurses regarding nutritional status assessment and support since they are aware of the nutritional status of the patients and play an active role in the process.

Materials and methods

Ethical approval dated July 13, 2012, and numbered KAEK-15/2345 was provided from Kecioren Training and Research Hospital Clinical Research Ethics Committee to start the study. Nurses who had worked in the intensive care or palliative service in the hospital for at least two months or had worked in the past voluntarily participated in this survey. They were asked to answer the Nurses' Nutrition Support Awareness Questionnaire for the Critical Patient consisting of 24 questions. The answers were then statistically evaluated and interpreted. The inclusion criteria for participating in the survey were volunteering and having worked in the intensive care or palliative service for at least two months.

Statistical analysis

Statistical analyses were evaluated using the Statistical Program for Social Sciences (SPSS 22.0). In the evaluation of the data, frequencies and percentages are given for qualitative data. Kolmogorov-Smirnov test was applied to determine the normal distribution of quantitative data. For quantitative data, mean and standard deviation values from descriptive statistical methods were given and for qualitative data, frequencies and percentages were given. Correct answers to the questions on general nutrition knowledge, oral enteral supplementation, enteral nutrition, and total parenteral nutrition were given 1 point, and incorrect answers were given 0 points. By dividing the total scores by the number of questions, the average scores of the participants in each section were calculated. Average scores from questions based on learning status were evaluated using the Kruskal Wallis test. All statistical calculations were evaluated in the 95% confidence range and at the $P<0.05$ significance level.

Results

A total number of 55 volunteer nurses participated in the study. The average age of the interviewers was 27.7; 21.8% of them were male and 78.2% were female. Of the participants, 23.6% were in their first year of professional life. In addition, 45.5% had two to ten years of professional experience and 30.9% had more than ten years. The units in which the interviewees worked at the time they answered the questionnaire were as follows: service (14.5%), palliative service (16.4%), and intensive care (69.1%). When the working years of the interviewees were examined, it is seen that six people worked in the same department for three years or less and the remainder had worked in the same unit for one to two years (Table 1).

Table 1: Demographic data of surveyed participants

		n	(%)
1. Age			
2. Gender	Female	43	(78.2%)
	Male	12	(21.8%)
3. Education Status			
	High School Graduates	9	(16.4%)
	Associate Degree Graduates	18	(32.7%)
	University Graduates	28	(50.9%)
	Post Graduates	-	
4. How many years have you been working in your profession?			
	0-1 year	13	(23.6%)
	2-10 years	25	(45.5%)
	10 years or more	17	(30.9%)
5. In which department do you work?			
	Service	8	(14.5%)
	Palliative Care	9	(16.4%)
	Intensive Care	38	(69.1%)
6. How many years have you worked in your department?			
	1 year	20	(36.4%)
	2 years	29	(52.7%)
	3 years or more	6	(11%)

The nutritional information of the interviewees was evaluated with 7-24 questions (Table 2).

To the question of “Is it necessary to give nutritional support to every hospitalized patient?” 81.8% responded, "It is necessary to evaluate."

To the question of "When should nutritional support be given to a patient with insufficient oral intake?" 67.3% stated "as soon as it was detected," while 9.1% stated "when signs of dehydration are given" and others (23.6%) stated that it would be more appropriate to wait a few days.

Only about one-third of the interviewees evaluated that "oral enteral supplementation should be given" to the question of “Which product provides nutritional support to the elderly patient with reduced oral intake? Other interviewers, however, stated that nutritional support should be provided to the patient with "enteral product by inserting nasogastric" and "total parenteral nutrition."

Awareness of starting fluid support for a patient with insufficient fluid intake was found in 58.2% of those interviewed, and the rest waited for signs of dehydration for fluid support.

In response to the question, "What should be the nutritional support of the patient who does not have a swallowing reflex?", 49.1% preferred "enteral feeding with the correct nasogastric tube."

Table 2: Distribution of answers to questions related to nutrition knowledge

	n	(%)
7. Do you think it is necessary to provide nutritional support to every hospitalized patient?		
Yes	6	(10.9%)
No, medical treatment should be done first	4	(7.3%)
Need to evaluate	45	(81.8%)
8. If the inpatient's oral intake is insufficient, on which day of hospitalization is nutritional support required?		
As soon as detected	37	(67.3%)
The third day	13	(23.6%)
If the patient shows signs of dehydration	5	(9.1%)
9. Which product provides nutritional support to an elderly patient with reduced oral intake?		
Oral enteral supplementation	18	(32.7%)
Enteral product with nasogastric insertion	17	(30.9%)
Total parenteral nutrition	20	(36.4%)
10. When should fluid support be given to a patient with insufficient oral fluid intake?		
As soon as detected	32	(58.2%)
The third day	1	(1.8%)
If the patient shows signs of dehydration	22	(40.0%)
11. If the patient does not have a swallowing reflex, which method should be used first for feeding?		
Total parenteral nutrition	26	(47.3%)
Enteral feeding with nasogastric insertion	27	(49.1%)
Should be supported with oral enteral supplementation	2	(3.6%)
12. How long does total parenteral nutrition last?		
Peripheral and central are indefinite	2	(3.6%)
Peripheral 14 days; central 14 days	23	(41.8%)
It is necessary to switch from peripheral to central as soon as possible.	30	(54.5%)
13. Are total parenteral products sufficient for nutrition?		
Yes	13	(23.6%)
No	42	(76.4%)
14. When should the set of patients receiving total parenteral nutrition be changed?		
12 hours	46	(83.6%)
24 hours	9	(16.4%)
It is not changed unless necessary		
15. Can the patient's treatment drugs be added to the parenteral nutrition solution?		
Yes	11	(20.0%)
No	44	(80.0%)
16. What is the reason for adding fatty acids, glutamine, vitamins and trace elements into total parenteral products?		
Since these substances are not present in TPNs, they cannot provide adequate nutrition on their own.	33	(60.0%)
Enabling patients to take more vitamins and minerals	17	(30.9%)
It is added to prevent bedsores.	5	(9.1%)
17. Which of the following is true?		
Peripheral nutritional solutions can be given through the central venous route.	13	(23.6%)
Central nutritional solutions can be given through the peripheral vascular pathway.	-	
Peripheral nutrition solutions should be given from the peripheral vein; central nutrition solutions should be given from the central route.	42	(76.4%)
18. Does a patient who is given oral enteral supplement support need to eat?		
Yes	15	(27.3%)
No	40	(72.7%)
19. In which of the following situations should enteral feeding be stopped? Multiple markings can be made.		
Melena (gastrointestinal bleeding)	47	(85.5%)
Intraoral wounds	4	(7.3%)
Ileus (intestinal obstruction)	43	(78.2%)
Absence of swallowing reflex	19	(34.5%)
20. Which of the following is true?		
Patients should be fed in a position with the head upright at 45 degrees.	54	(98.2%)
Patients with PEG and nasogastric can be fed in a lying position.	1	(1.8%)
Only patients at risk of aspiration should be fed in a position where the head is in an upright position of 45 degrees.		
21. Can enteral and parenteral nutrition be given simultaneously?		
Yes	44	(80.0%)
No	11	(20.0%)
22. Within how many hours should the enteral product placed in the feeding bag be consumed (at room temperature)?"		
24 hours	11	(20.0%)
12 hours	9	(16.4%)
8 hours	35	(63.6%)
23. How many hours should the first feeding be after the newly opened percutaneous endoscopic gastrostomy (PEG)?		
It can start immediately.	3	(5.5%)
After 4 hours. it can be started with water.	9	(16.4%)
Nothing is given for 24 hours	43	(78.2%)
24. Which type of diet is easiest to feed your patients?		
Oral feeding of the patient. even with assistance	34	(61.8%)
Nasogastric or enteral feeding with PEG	6	(10.9%)
Total parenteral nutrition by peripheral route	2	(3.6%)
Total parenteral nutrition by central route	13	(23.6%)

Table 3: Distribution of answers to questions related to general nutrition, oral enteral supplementation, enteral nutrition information, and TPN information

	n	(%)
Correct Response Rates in General Nutrition Knowledge		
7. Do you think it is necessary to provide nutritional support to every hospitalized patient?		
Need to evaluate	45	(81.8%)
8. If the inpatient's oral intake is insufficient, on which day of hospitalization is nutritional support required?		
As soon as detected	37	(67.3%)
10. When should fluid support be given to a patient with insufficient oral fluid intake?		
As soon as detected	32	(58.2%)
11. If the patient does not have a swallowing reflex, which method should be used first for feeding?		
Enteral feeding with nasogastric insertion	27	(49.1%)
24. Which type of diet is easiest to feed your patients?		
Oral feeding of the patient, even with assistance	34	(61.8%)
Correct Response Rates in Oral Enteral Supplement Knowledge		
9. Which product provides nutritional support to an elderly patient with reduced oral intake?		
Oral enteral supplementation	18	(32.7%)
18. Does the patient who is given oral enteral supplement support need to eat?		
Yes	15	(27.3%)
Correct Response Rates in Enteral Nutritional Knowledge		
19. In which of the following situations should enteral feeding be stopped? Multiple markings can be made		
Melena (gastrointestinal bleeding)	47	(85.5%)
Intraoral wounds	4	(7.3%)
Absence of swallowing reflex	19	(34.5%)
20. Which of the following is true?		
Patients should be fed in a position with the head upright at 45 degrees.	54	(98.2%)
21. Can enteral and parenteral nutrition be given simultaneously?		
Yes	44	(80.0%)
22. Within how many hours should the enteral product placed in the feeding bag be consumed (at room temperature)?"		
24 hours	11	(20.0%)
23. How many hours should the first feeding be after the newly opened percutaneous endoscopic gastrostomy (PEG)?		
After 4 hours, it can be started with water.	9	(16.4%)
Correct Response Rates in Total Parenteral Nutrition (TPN) Knowledge		
12. How long does total parenteral nutrition last?		
It is necessary to switch from peripheral to central as soon as possible.	30	(54.5%)
13. Are total parenteral products sufficient for nutrition?		
No	42	(76.4%)
14. When should the set of patients receiving total parenteral nutrition be changed?		
24 hours	9	(16.4%)
15. Can the patient's treatment drugs be added to the parenteral nutrition solution?		
No	44	(80.0%)
16. What is the reason for adding fatty acids, glutamine, vitamins and trace elements into total parenteral products?		
Since these substances are not present in TPNs, they cannot provide adequate nutrition on their own.	33	(60.0%)
17. Which of the following is true?		
Peripheral nutritional solutions can be given through the central venous route.	13	(23.6%)

For the TPN administration route, a large proportion of the interviewees (76.4%) stated that the peripheral product should be administered via the central route. Of the total respondents, 83.6% did not have an awareness that parenteral sets should be changed every 24 hours and 76.4% believed that TPN was not sufficient for full nutrition. Sixty percent believed that fatty acids, glutamine, vitamins, and trace elements should be added to total parenteral products and 80% knew that treatment drugs should not be added to TPN. The rate of those who knew that peripheral nutrition solution could be given via the central route was 23.6%, but all the interviewees were aware that central nutrition solution could not be given via the peripheral route.

Regarding oral enteral supplements (OES), 27.3% of the nurses answered “yes” to the question, “Does the patient taking OES need to eat?” To the question, “In which of the following situations should enteral feeding be stopped? Multiple markings can be made,” 85.5% marked melena (gastrointestinal bleeding), 7.3% marked intraoral sores, 78.2% marked ileus (intestinal obstruction), and 34.5% marked absence of swallowing reflex. Almost all (98%) of the interviewers knew that the feeding position (oral / NG with enteral / enteral with percutaneous

endoscopic gastrostomy (PEG)) was in a 45-degree head position. Eighty percent responded "yes" to the question, "Can enteral and parenteral nutrition be given together?"

In response to the question, "Within how many hours should the enteral product placed in the feeding bag be consumed (at room temperature)?" 63.6% answered correctly by saying "eight hours.

To the question, "After how many hours should the first feeding be given to the patient after the newly opened PEG?" 78.2% responded "24 hours." The question, "Which type of diet is easiest to feed your patients?" evoked the following answers from nurses: 61.8% said that the patient should be fed orally, even with assistance, and 23.6% responded that the patient should receive TPN via the central route.

The correct answer rates for general nutrition, oral enteral supplementation, enteral nutrition information, and TPN information of the interviewers are given in Table 3. There was no statistically significant difference between the answers to general nutritional information, oral enteral supplement, enteral nutrition, and total parenteral nutrition questions according to age (Table 4), gender (Table 4), or education status (Table 5) among the nurses participating in the survey.

Table 4: Nutrition knowledge by age and gender

	Age				*P*-value
	Under 29 (n:32)		30 and above (n:23)		
	$\bar{X}$	SD	$\bar{X}$	SD	
General Nutrition Information	0.64	0.18	0.63	0.19	0.607
Oral Enteral Supplementation	0.28	0.36	0.33	0.36	0.596
Enteral Nutrition	0.59	0.15	0.63	0.16	0.508
Total Parenteral Nutrition	0.49	0.21	0.56	0.20	0.213
	Gender				
	Female		Male		
General Nutrition Information	0.63	0.20	0.67	0.13	0.518
Oral Enteral Supplementation	0.26	0.32	0.46	0.45	0.147
Enteral Nutrition	0.60	0.17	0.62	0.10	0.759
Total Parenteral Nutrition	0.51	0.22	0.54	0.19	0.633

Table 5: Nutrition information by education status, years of work in the profession, department, and years of work in the department

	Education Status						*P*-value
	High School Graduates		Associate Degree Graduates		University Graduates		
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
General Nutrition Information	0.69	0.15	0.59	0.19	0.65	0.19	0.421
Oral Enteral Supplementation	0.28	0.44	0.36	0.33	0.27	0.35	0.531
Enteral Nutrition	0.67	0.17	0.58	0.17	0.61	0.14	0.463
Total Parenteral Nutrition	0.63	0.20	0.48	0.21	0.51	0.21	0.141
	Years of Work in the Profession						
	0-1 Year		2-10 Years		10 Years or more		
General Nutrition Information	0.65	0.15	0.65	0.23	0.61	0.15	0.801
Oral Enteral Supplementation	0.27	0.26	0.16	0.28	0.53	0.41	0.007
Enteral Nutrition	0.54	0.15	0.64	0.14	0.61	0.17	0.136
Total Parenteral Nutrition	0.50	0.20	0.47	0.24	0.61	0.14	0.097
	Department						
	Service		Palliative Care		Intensive Care		
General Nutrition Information	0.73	0.15	0.56	0.13	0.64	0.20	0.142
Oral Enteral Supplementation	0.63	0.44	0.44	0.17	0.20	0.32	0.003
Enteral Nutrition	0.63	0.13	0.56	0.19	0.62	0.15	0.539
Total Parenteral Nutrition	0.60	0.12	0.39	0.20	0.53	0.22	0.087
	Years of Work						
	1 year		2 years		3 years or more		
General Nutrition Information	0.68	0.16	0.59	0.18	0.73	0.21	0.129
Oral Enteral Supplementation	0.30	0.34	0.33	0.36	0.17	0.41	0.459
Enteral Nutrition	0.54	0.13	0.64	0.15	0.67	0.16	0.045
Total Parenteral Nutrition	0.51	0.19	0.52	0.23	0.53	0.19	0.884

The rate of correct answers to oral enteral supplementation questions was statistically significant and high among nurses who had been in the profession for ten or more years (Table 5). Similarly, the rate of correct answers to oral enteral supplementation questions among nurses working in the service is statistically significant and high (Table 5). Nurses who worked in the department for three years or more gave a statistically significant and highly accurate answer to the enteral nutrition questions (Table 5).

Discussion

Enteral and parenteral nutrition practices are of great interest to nurses and are common in clinics, especially in intensive care and palliative services. Nursing follow-up and initiatives are extremely important in effective implementation of nutrition practices and prevention of possible complications. It is among the responsibilities of the nurse to determine the need for nutritional support, to maintain the feeding tube or nutrition set, to choose the right nutritional product, and to manage the speed and time of the feeding product, expiration dates, and storage conditions.

This study shows that nurses are aware of the need for nutritional support in critical patients and adopt this role. In the study of Kalaldeh et al. [7] on intensive care nurses, it was determined that nurses perceived clinical nutrition practices as a secondary nursing role. In another study conducted by Yılmaz [8], nearly half of the nurses stated that they had no idea about the occurrence of malnutrition in the clinics where they worked, and that nutritional problems were primarily the responsibility of the physicians. In our study, we think that this awareness of duty is due to in-service training.

The most accurate and most incorrectly answered questions of nurses were examined in the present study. The most accurately answered question was that patients should be fed in a position where the head is in an upright position at 45 degrees. The most incorrectly answered question was the preference of invasive feeding methods instead of oral enteral supplement support for "the diet of the elderly patient with impaired oral intake."

Nurses were more familiar with TPN and its management. The necessity of choosing large and central veins in parenteral nutrition applications [9] was answered correctly by 80%. In Çelebi's study, nurses' awareness of parenteral nutrition and its complications were similar to our study [10]. Unlike our study, the research of Akın indicated that TPN products, according to their osmolarity, were the least known question among nurses. In the same study, it was determined that the questions related to the storage location and duration of enteral nutrition products, gastric residual volume, and drug administration through enteral feeding tubes were the questions most frequently answered incorrectly [11]. However, in our study, the level of enteral nutrition knowledge was evaluated as moderate.

In the survey conducted by Akın and Koçhan [11], the least correct answers for the questions involved storage conditions for the enteral product. Our study did not include questions about the storage condition, but the rate of correct

answers to the questions about enteral nutrition was evaluated as moderate with 60-68%.

Percutaneous endoscopic gastrostomy (PEG) is a simple, inexpensive, effective and low complication rate method preferred in patients with normal gastrointestinal system functions and need long-term enteral nutritional support [12]. In our hospital, the PEG procedure is performed laparoscopically by a gastroenterologist. For the feeding time after PEG, 78.2% of the nurses gave the incorrect answer, indicating that the feeding time should wait one day. However, after a four-hour waiting period, low volume (20cc/h) nutrition can be started. If there are no complications and the patient can tolerate them, feeding can start at this time.

No difference was found between educational status, age, gender, and nutritional knowledge in the current research.. However, the correct answer to the questions about enteral nutrition was found to be significantly higher in those who had worked in the department for more than three years and in the profession for more than ten years.

Oral enteral nutrition support questions were among the questions with a high correct answer rate by hospital service nurses. We think that this difference is related to the higher need and use of oral enteral supplements in patients treated in the service.

Insufficient information and deficiencies in practice should be determined through knowledge-level studies on issues. Continuity of education should be ensured with effective in-service training programs.

This study does contain limitations. Since our aim was directed at single-center (a chest diseases hospital) and critically ill nutritional support, only nurses working in the intensive care and palliative service participated in the survey and their numbers were limited. For future studies, observational studies are proposed on the level of knowledge reflected not only by the survey but also by the application.

Conclusion

Nurses have sufficient knowledge about the necessity of nutritional support and TPN. It is seen that the level of knowledge about enteral nutrition, fluid support, and nutrition of patients without swallowing reflex needs to be supported by theoretical and practical training. Therefore, it is necessary to support the knowledge level of healthcare professionals on patient nutrition support with theoretical and practical training.

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