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Knowledge levels of nursing students regarding the nutritional care of surgical patients: a descriptive study

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ABSTRACT

Objective: This study aimed to assess the knowledge levels of nursing undergraduate students regarding the nutritional care of surgical patients.

Methods: The descriptive study included 240 second-, third-, and fourth-year nursing students at a university in Türkiye's capital during the 2024–2025 academic year. Students were eligible if they were enrolled in these years of the nursing program, volunteered to participate, and had Internet access. The Student Demographic Information Form and the Questionnaire for Nutritional Care of Surgical Patients were used to collect the research data. Kruskal-Wallis H test was used to data analysis.

Result: The median age of the students was 22 (min-max: 19-26) years. Most (84.6 %) nursing students were female, and second-year students (47.5 %). The evaluation of students' knowledge levels by grade showed that second-year students had the highest scores (35.26 ± 10.73), while fourth-year students had the lowest (32.52 ± 7.84). The median scores were 36, 32, 32, and 36 for second-year, third-year, fourth-year, and total groups, respectively. The overall mean for all students was 34.73±10.50. No statistically significant difference was found in knowledge levels between grades (p=0.065).

Conclusion: Nursing students demonstrated only moderate knowledge of nutritional care for surgical patients, with notable gaps in key areas, including malnutrition, timing of postoperative nutrition, and enteral–parenteral nutrition principles. The findings underscore the need to integrate a dedicated course on nutritional care, encompassing both theoretical and practical components, into the curriculum.

Keywords: knowledge, nursing students, nutritional care, surgical patients

Introduction

Malnutrition is defined as a condition arising from insufficient intake or absorption of nutrients, resulting in altered body composition (reduced fat-free mass) and body cell mass, which leads to lower physical and mental function and impaired clinical outcomes from disease.[1,2] In surgical patients, prolonged preoperative fasting, the metabolic and endocrine response to surgical trauma, surgical complications, and patients' inability to express hunger and inadequate nutrient intake are risk factors for malnutrition. [3,4] It is reported that approximately 24-65% of patients who undergo surgery are at risk of malnutrition.[3]Nutritional therapy aims to prevent existing and potential malnutrition, strengthen the immune system, accelerate wound healing, minimize catabolic effects, and reduce mortality, complications, and

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infection rates associated with malnutrition in patients hospitalized in surgical clinics.[5,6]

Nurses play a significant role and bear considerable responsibility in nutritional care.[7,8] It plays an essential role in early identification of patients at risk of malnutrition, and in implementing nutritional interventions.[1] However, it has been reported that nurses' education and knowledge of nutritional care are insufficient, potentially limiting their ability to identify and manage malnutrition in patients.[9,10]

The literature reveals that nurses in internal and surgical intensive care units lack adequate expertise and fail to properly assess the quality of the nutritional therapy administered to patients in their units [11-16], it also reveals that their awareness and adherence to some evidence-based practice recommendations for nutritional care are inadequate [17,18], and that their knowledge levels regarding nutritional care need to be supported through theoretical and practical training.[19,20]

This necessitates giving special importance to equipping nursing students with knowledge and skills in nutritional management throughout their education. Studies have reported that the knowledge levels of actively practicing nurses regarding nutritional care are insufficient, underscoring the need to determine the knowledge levels of nursing students who have not yet graduated in this area. To the best of our knowledge, no study in the literature has evaluated nursing students' knowledge of nutritional care for surgical patients. This study aimed to assess the knowledge levels of nursing undergraduate students regarding the nutritional care of surgical patients. It is predicted that the study results will enable the integration of lessons on the nutritional care of surgical patients into the nursing education curriculum, thereby guiding it.

Main Points

- Nursing students demonstrated moderate knowledge of nutritional care of surgical patients.
- Knowledge levels peaked in the second year, when Surgical Nursing lessons were taught, but declined thereafter.
- The findings show that undergraduate nursing programs need to strengthen their nutrition instruction.
- A nutrition course, including both theoretical and practical components, should be added to the nursing curriculum.

The research questions to be answered are as follows:

1. What is the level of knowledge among nursing students regarding the nutritional care of surgical patients?
2. Is there a difference in the knowledge level of nursing students regarding the nutritional care of surgical patients based on class variable?

Material and Methods

Study design

This study is descriptive. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines were used in study reporting.

Settings and participants

The study population included second, third-, and fourth-year students of a nursing faculty in the capital of Türkiye's during the academic year 2024–2025. In their first year, students take a course on "nutritional requirements" as part of their "Fundamentals of Nursing" curriculum, which is approximately eight hours long; this course covers enteral and parenteral nutrition types and care. In the second year, nutrition is not directly included in the "Surgical Nursing" curriculum; it is briefly touched upon within course, and the nutritional recommendations of the Enhanced Recovery After Surgery (ERAS) protocol for the are included in this course. The inclusion criteria were (a) a student enrolled in the second, third, or fourth year of the undergraduate nursing program in the academic year 2024–2025, (b) volunteering to participate in the research, and (c) having Internet access. The study sample included 240 students, determined using a sample calculation formula with a known universe (95% confidence interval, 5% error rate).

Instruments

The Student Demographic Information Form and the Questionnaire for Nutritional Care of Surgical Patients were used to collect research data.

Student Demographic Information Form: It consists of three questions: age, gender, and grade level.

Questionnaire for Nutritional Care of Surgical Patients: It was developed by researchers through a literature review [1,3,6,21-23] to assess nursing students' knowledge of nutritional care for surgical patients. The questionnaire consists of 15 questions with "true," "false," and "don't know" options. The form was sent to 8 experts, including academics and clinical nurses, for evaluation of content validity. Expert opinions were analyzed using the Lawshe technique [24]. Experts were asked to evaluate each item as "not appropriate," "appropriate but requires modification," or "appropriate," and to provide reasons for not finding the items appropriate and suggestions for modification. According to Lawshe's critical values , the minimum Content Validity Ratio (CVR) for an element to be considered valid by a panel of 8 experts was set at 0.75.[24] Accordingly, elements deemed "essential" by at least seven experts were considered suitable for content validity. The questionnaire was finalized after revisions based on expert recommendations. The minimum score for the questionnaire is 0, and the maximum is 60.

Data collection

After obtaining approval from the ethics committee and written permission from the faculty, the completed forms were collected between June and November 2025 by sending the 'Google Forms' questionnaire link to the students through WhatsApp and e-mail. Participants could view the research questions only after reading the informed consent form. They took approximately 20 minutes to complete the questionnaire.

Data analysis

The IBM SPSS 26 (Statistical Package for the Social Sciences 26 for Windows) was used to analyze the data. Descriptive statistics were presented as median (minimum–maximum) and mean ± standard deviation (X ± SD) for numerical variables, and as number (n) and percentage (%) for categorical variables. The Kolmogorov-Smirnov (K-S) and Shapiro-Wilks tests were used to determine whether the data were normally distributed. Because the normality assumption was not met, the nonparametric Kruskal-Wallis H test was used to compare total scores across grade levels. The significance level was accepted as .05 in all analyses.

Ethical considerations

Written permission was obtained from the university ethics committee (No.: E-51986023-605-00004199531), and institutional approval was obtained from the Faculty of Nursing Dean's Office. The recommendations of the Association of Internet Researchers' Ethics Study Committee were followed for Internet research. The informed consent form was the first page of the questionnaire. Each participant accepted the following statement: 'I have read the information, and I agree to participate in the research voluntarily' and agreed to voluntary participation by clicking the consent button. Participants who did not click the consent button in the survey could not reach the questions page. Participants were assured of their right to refuse to participate in the study and the confidentiality of the information they provided. By signing the voluntary consent form, nursing students were assured of anonymity, the freedom to withdraw from the study at any time, and that their data would be used only in the academic field. Additionally, the researchers did not declare any ethical conflicts or financial benefits.

Results

The median age of the students was 22 (min-max: 19-26) years. Most (84.6 %) nursing students were female, and second-year students (47.5 %). Table 1 shows demographic data for students by current year of study.

When students' knowledge levels were evaluated by grade in the study, it was determined that second-year students had the highest score (35.26±10.73), while

Table 1. Nursing students' demographic data according to year of study

	Second year (n=114- %47.5)	Third year (n=103- %42.9)	Fourth year (n=23- %9.6)	All participants (n=240- %100)
Gender n (%)				
Female	97 (85.1)	89 (86.4)	17 (73.9)	203 (84.6)
Male	17 (14.9)	14 (13.6)	6 (26.1)	37 (15.4)
Median age (min-max)	22 (19-26)	22 (20-26)	23 (22-26)	22 (19-26)

fourth-year students had the lowest (32.52±7.84). The overall mean for all participants was 34.73±10.50. The median scores were 36, 32, 32, and 36 for second-year, third-year, fourth-year, and total groups, respectively. No statistically significant difference was found in knowledge levels between grades (p=0.065) (Table 2).

When the knowledge levels of 240 students regarding nutrition practices were evaluated, it was determined that, overall, high accuracy rates were achieved on a significant portion of the questions. Still, there were substantial knowledge deficiencies in some basic concepts and clinical practice areas. Correct answer rates for the questions range from 20.8% to 94.2%. It was observed that the response rates to questions such as the definition of malnutrition (question 2), the time to start postoperative feeding (question 7), and the types of enteral and parenteral nutrition (questions 9 and 10) ranged from 20.8% to 40%. Nearly half of the students answered these questions incorrectly. On the other hand, the statement that nutritional assessment should be performed when patients are admitted to the clinic had the highest percentage of correct answers (94.2%) (Table 3).

Table 2. Scores knowledge levels of nursing students according to year of study

Academic year	n	Knowledge level	
		mean±SD (median)	min-max (Q1-Q3)
Second year	114	35.26±10.73 (36)	0-60 (32-40)
Third year	103	34.64±10.81 (32)	8-60 (28-40)
Fourth year	23	32.52±7.84 (32)	24-60 (28-36)
Total	240	34.73±10.5 (36)	0-60 (28-40)
p*	.065		
H*	5.468		

SD, standard deviation; min, minimum; max, maximum; Q1, First Quartile; Q3, Third Quartile
*Kruskal Wallis Test
Grouping Variable: academic year

Discussion

This study aimed to determine nursing students' knowledge levels regarding the nutritional care of surgical patients during their undergraduate education. The study found that students' overall knowledge of nutritional care for surgical patients was generally moderate. It was determined that second-year students had the highest knowledge scores, but there was a downward trend in moderate knowledge levels as they progressed toward their fourth year. Although the Surgical Nursing course is taught in the second year and there is no independent topic specifically on nutritional care within the curriculum, the limited treatment of nutritional care in content such as ERAS protocols can be considered an influential factor in this outcome. The fact that students do not take an additional undergraduate course in this field until the fourth grade is also considered another factor supporting the decrease in knowledge levels. However, the absence of a statistically significant difference between grade levels is noteworthy. This situation can be attributed to students' continuous participation in clinical practice until graduation and their continued experience with the nutritional requirements of surgical patients across different clinical settings. In the systematic review by Doménech Briz et al., it was found that nurses' knowledge of nutritional assessment, a fundamental component of nutritional care, was insufficient.[20]In a study conducted in Italy, the attitudes of 245 nursing students towards nutritional care were evaluated, and it was found that 54% of first-year students, 98.5% of second-year students, and 100% of third-year students received training in nutrition and nutritional care. The majority of students in all classes had a neutral attitude towards nutritional care [25], in a study conducted by Buxton et al. (2013) with 166 3rd- and 4th-year nursing students, it was determined that 3.6% had good nutritional knowledge, 62.7% were sufficient, and 33.7% were inadequate.[26]

The findings of this study indicate that students have significant knowledge gaps in some basic information related to nutritional care. The fact that the accuracy rates for questions specifically regarding the definition of malnutrition, the timing of starting nutrition in the postoperative period, and the characteristics of enteral and parenteral nutrition ranged from 20.8% to 40% indicates that students have knowledge gaps in these areas.

Particularly within ERAS protocols, there is strong evidence that initiating oral fluid intake early postoperatively (e.g., at the second hour) is safe and

Table 3. The percentage of correct answers for each question

No	Questions	The correct answer to the question	Number of participants choosing the correct answer n (n=240) n (%)
1.	A nutritional assessment should be performed upon the patient's initial admission to the clinic.	T	226 (94.2)
2.	A body mass index below 20.5 kg/m2 is defined as malnutrition.	F	96 (40)
3.	Patients at serious risk of malnutrition should receive nutritional therapy 7-14 days before surgery.	T	204 (85)
4.	Parenteral nutrition can be administered in situations where oral/enteral nutrition is not feasible.	T	218 (90.8)
5.	Patients undergoing surgery who are not at risk of aspiration can drink clear liquids up to two hours before anesthesia.	T	164 (68.3)
6.	Patients undergoing surgery who are not at risk of aspiration can eat solid food up to six hours before anesthesia.	T	167 (69.6)
7.	Patients can be given liquid food in the second postoperative hour without waiting for auscultation of bowel sounds.	T	50 (20.8)
8.	Patients can be given solid foods without waiting for bowel sounds to be auscultated after the eighth postoperative hour.	F	145 (60.4)
9.	Enteral nutrition can be administered through a peripheral or central venous catheter.	F	104 (43.3)
10.	Feeding via gastrostomy is a type of parenteral nutrition.	F	119 (49.6)
11.	Enteral nutrition can be provided while the patient is in the supine position.	F	162 (67.5)
12.	Enteral nutrition products should not hang in the feeding bag for more than 8 hours.	T	184 (76.7)
13.	Multiple medications can be administered at the same time through an enteral feeding tube.	F	141 (58.8)
14.	Infusion sets used in parenteral nutrition should be changed every 24 hours.	T	182 (75.8)
15.	Parenteral nutrition bags should be protected from direct sunlight.	T	228 (95)

T; True; F;False

promotes healing.[22] However, the low rate of correct answers in our findings, such as those related to this type of question, suggests that students may have been influenced by more traditional clinical practices rather than current evidence-based approaches. Indeed, even if students have learned current guidelines theoretically during their training, they may still observe traditional approaches widely practiced in clinical area, such as waiting for bowel sounds. This situation can lead to a mismatch between students' knowledge and their perception of practice, and this may be reflected in our results.

The inability to accurately define malnutrition makes it challenging to identify at-risk patients early on and can negatively impact the creation of appropriate nutritional treatment plans.[1] In a study by Yfanti et al., the nutritional knowledge of 506 nursing students was evaluated, and it was found that they had insufficient knowledge of assessing body mass index.[27] In a cross-sectional study by Chonnail et al., it was found that nursing students had low knowledge of nutritional care for cancer patients.[28] This study also indicates a high level of misinformation regarding postoperative nutrition and that clinical practices crucial for preventing complications and supporting the healing process have not been sufficiently internalized. Misconceptions about enteral and parenteral nutrition indicate a potential lack of comprehensive knowledge among students about the fundamental principles, practices methods, and

indications of nutritional therapy. On the other hand, the statement that nutritional assessment should be performed upon patients' admission to the clinic has a high accuracy rate of 94.2%, indicating that students have a strong awareness of the clinical importance of nutritional assessment. This result suggests that a general awareness has formed at the theoretical level, but it is not sufficiently supported by knowledge of the details of clinical processes. Strengthening hospital collaborations and enabling students to participate in clinical practices in hospital clinical nutrition units can significantly contribute to increasing their knowledge and practical skills. Accordingly, incorporating more structured clinical practices into the program and encouraging closer collaboration with hospital staff can help reduce the gap between theory and practice and improve educational outcomes.[8,9,15,26]In this context, the findings clearly demonstrate the need to review the current curriculum and provide a more comprehensive, in-depth, and structured education in clinical nutrition. Additionally, adding a course on clinical nutrition to the curriculum is considered requirement for enhancing students' professional competence and preparing them more effectively for clinical practice.[29] Increasing opportunities for practice-based learning is crucial for addressing knowledge gaps. The use of educational modules enriched with case studies, in particular, can improve students' ability to apply theoretical knowledge to real-life scenarios. Furthermore, integrating interactive teaching methods that incorporate clinical decision-making processes related to nutritional therapy into the curriculum will strengthen students' critical thinking and problem-solving skills. Such approaches support not only rote memorization but also the effective application of knowledge.[26] Student-centered and self-directed learning approaches have become more prevalent in higher education in recent years, replacing teacher-centered instruction. Students must assume more responsibility for locating, obtaining, and critically analyzing instructional resources due to the decline in traditional lecture hours. This change is especially significant in the context of nursing education since evidence-based practice relies on the capacity to independently find and use current information.[30] In nursing education programs, there are courses on nutritional care based on international regulations. In the United States, nutritional knowledge level is among the topics assessed in the National Council Licensure Examination (NCLEX), the nursing licensing exam.[31] In Europe, Regulation 2005/36/EC emphasizes that nutritional care is included in the theoretical part of nursing education, within the basic sciences. [29] However, current research shows that nurses' knowledge of nutrition is often inadequate. [32,33] Furthermore, some studies indicate that nurses do not make sufficient effort to update their nutritional knowledge after graduation.[34] Macaninch and Martyn et al. delivered British Association for Parenteral and Enteral Nutrition (BAPEN's) clinical nutrition training modules to nursing students online [35], while Xia et al. aimed to increase knowledge levels by providing clinical nutrition training via e-learning [36] . In Buxton & Davies' study, it was suggested that nursing students need more education in nutritional care, and that professionals planning the university's nursing curriculum should develop it with these results in mind.[26]

Limitations

The unequal distribution of participants across grade levels is one of the study's primary limitations; in particular, the very low presence of fourth-year students may have decreased the statistical power of between-group comparisons. It is therefore advised that more balanced samples be used in future research.

Conclusion

This study showed that nursing students have moderate overall knowledge of nutritional care for surgical patients, with significant deficiencies in critical areas, including the definition of malnutrition, postoperative nutritional timing, and the principles of enteral and parenteral nutrition. Although second-year students scored higher, the general decline in later years and the lack of significant differences across grades suggest deficiencies in the curriculum. These findings highlight the need to improve curriculum for nursing students so they can provide effective and evidence-based nutritional care. In this context, integrating a structured nutritional care course into the curriculum is recommended. Furthermore, strengthening interdisciplinary collaboration with the nutrition team and increasing students' clinical practice experience in the field of nutrition are also important.

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Author contributions

Conception: R.E.S., Z.Ö.; Design: R.E.S., Z.Ö., D.S.; Data acquisition: Z.Ö., D.S.; Data analysis: R.E.S.; Data interpretation: R.E.S.; Drafting of the manuscript: R.E.S., Z.Ö., D.S.; Critical revision of the manuscript: R.E.S. All authors reviewed the results, approved the final version of the manuscript, and agreed to be accountable for all aspects of this study.

Ethical approval

This study was approved by the Hacettepe University Social Sciences and Humanities Researches Ethics Board (Date: May 6, 2025, Decision/Protocol No: No.: E-51986023-605-00004199531). Informed consent was obtained from all participants involved in this study.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of interest

The authors declare that this study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Generative AI statement

The authors declare that no generative AI or AI-assisted technologies were used in the writing or preparation of this study.

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