

Original Article



Knowledge, attitudes and practices of intensive care unit nurses towards nutritional care in critically ill patients: A descriptive cross-sectional study

Ata Mahmoodpoor¹, Sarvin Sanaie², Fatemeh Momen³, Mohammad Ata Pourmoghaddam⁴, Seied Hadi Saghaleini^{5*}

¹Faculty of Medicine, Tabriz University of Medical Sciences, Iran.

²Neurosciences Research Center, Aging Research Institute, Tabriz University of Medical Sciences, Iran

³Students Research Committee, Tabriz University of Medical Sciences, Iran

⁴Yeditepe Dental Student Association Research Committee Member, Faculty of Dentistry, Yeditepe University, Istanbul, Turkey

⁵Fellowship of Critical Care Medicine, Faculty of Medicine, Tabriz University of Medical Sciences, Iran

Article info

Article History:

Received: 30 Jan. 2021

Accepted: 11 Apr. 2021

e-Published: 27 Oct. 2021

Keywords:

- Nurses
- Nutritional care
- Intensive care unit
- Knowledge
- Attitudes
- Practices

Abstract

Introduction: In recent years, there has been a growing concern about the lack of adequate nutrition Knowledge among nurses. Nutrition training in the medical curriculum and for healthcare professionals is contradictory, inadequate, and weak. Nurses are one of the most reliable sources of nutritional information for patients; and yet, little research has been done so far on nurses' information regarding their important role in nutritional care. Our study is designed to assess the current level of Knowledge, attitudes, and practices of nurses in intensive care units (ICUs).

Methods: A four-part questionnaire was used in this study. This descriptive cross-sectional study was conducted from July 2019 to July 2020. The sample size consisted of 110 nurses based on the statistical data obtained from the nursing offices of two hospitals of Tabriz University of medical science including all the nurses working in the ICUs. Thereafter, all questionnaires were re-collected and data were finally analyzed.

Results: Results showed that from 110 nurses which were included in this study, 73.6% had high Knowledge, 45.5% had moderate practices, and 58.2% had a positive attitude about nutritional support. Age and level of education had a significant correlation with their knowledge ($P=0.005$ and $P=0.001$, respectively). Nursing attitude had a significant correlation with age and the level of education ($P=0.03$ and $P=0.003$). And also, nursing practice had a significant relationship with age, work experience in the ICU, and the level of education ($P=0.001$, $P=0.001$ and $P=0.004$, $P<0.05$).

Conclusion: Nurses surveyed in this study had a high knowledge, moderate practice and a positive attitude regarding nutritional care in patients admitted to the ICU.

Introduction

Malnutrition is one of the major topics in clinical practice that can be treated with appropriate nutritional care by health care providers. Nutritional patterns in the Middle East have clearly changed in the past two decades. The main reasons for these changes are urbanization and social improving.¹ The American and the European Society for Parenteral and Enteral Nutrition (ASPEN and ESPEN) have provided guidelines for assessing and determining nutritional care programs for patients at the risk of malnutrition.² Patients who are hospitalized with malnutrition experience longer hospital stays, more morbidity, higher mortality rates, and more complications compared to patients receiving adequate nutrition.³ These clinical experiences and the lack of knowledge and

awareness about them demonstrate a missing puzzle piece in nutrition.⁴

Evidence-based studies on nutritional care are advancing rapidly; so it seems that medical staff need to improve their practical nutritional skills. In this regard, improving the outcome of patients and reducing the costs of health care is clearly related to the quality of patients' nutritional care. Nutrition and related sciences are not fully included in most clinical retraining programs.⁵

Definitely, nurses play a primary and a very important role in the nutritional care support team alongside nutritional assessment, clinical monitoring, the provision of parenteral nutrition, and the evaluation of drug-nutrition interactions. In recent years, there has been a growing concern about the lack of nutritional awareness among

*Corresponding Author: Seied Hadi Saghaleini, Email: Hsaghaleini@gmail.com, Saghaleinih@tbzmed.ac.ir

nurses. Nutrition training in the medical curriculum is contradictory and inadequate.⁶ Nurses are one of the most reliable sources of nutritional information for the patients and little research has been done on nurses' information about their role in nutritional care, understanding the principles and components of nutrition, and their experiences in this regard. Therefore, the present study was performed to assess the current level of knowledge, attitudes, and practices of nurses in intensive care units (ICUs) regarding the principles of nutrition.

Methods

This cross-sectional descriptive study was performed from July 2019 to July 2020 in Tabriz University of medical science. The sample size consisted of 110 people based on the statistical data obtained from the nursing offices of the of two hospitals of Tabriz University of medical science, which included all the nurses working in the ICUs. A questionnaire (Tables 1-4) was designed and distributed among the participating nurses. Then they

were re-collected and the ones meeting the exclusion criteria were excluded. The inclusion criteria were all the nurses working in the mentioned ICU departments and the exclusion criteria were nurses' refusal to participate in the study, and incomplete forms.

A four-part questionnaire was used composed of the following parts: demographic information, closed/open questions related to knowledge, closed/open questions

Table 1. Questionnaire - Part I: demographic information

Numbers	Questions
1	Gender?
2	Age?
3	Level of education?
4	During your education period, did you take a course that called "Nutrition"?
5	Work experience time?
6	Work experience time in the ICU?

ICU: intensive care unit.

Table 2. Questionnaire - Part II: knowledge questions

Numbers	Questions
1	On which basis is the body mass index (BMI) measured?
2	What is the normal range of BMI in adults?
3	What is the approximate amount of energy per 1 gram of carbohydrates, 1 gram of protein and 1 gram of fat from right to left, respectively?
4	What is the main energy base required in patients receiving parenteral nutrition?
5	How many hours after beginning of mechanical ventilation, starting of enteral feeding can reduce hospital mortality?
6	In the case of malnourished patients, respectively, how long before and after the minor procedure is it necessary to stop and restart enteral feeding?
7	How much is the residual volume of the stomach to suspect intolerance to enteral nutrition?
8	Which method do you recommend for a patient in a critically ill condition who cannot able to eat Oral?
9	Which is water-insoluble vitamin?
10	Which of the following are not antioxidants?
11	Which type of gavage do you prefer to use in the ICU post operation?
12	What is NUTRIC Score?
13	Which serum index is useful in assessing a patient's nutritional status?
14	Is the skin fold thickness in biceps and triceps muscles important in nutritional status?

BMI: body mass index; ICU: Intensive Care Unit; NUTRIC Score: Nutrition Risk in Critically ill score.

Table 3. Questionnaire - Part III: attitude questions

Numbers	Questions
1	Assessing the nutritional status of patients is one of the tasks of which member of medical team?
2	Is adequate nutritional support provided routinely in your ward?
3	What are the criteria for assessing the nutritional status of each patient who admitted to your ICU?
4	Is the patient weighed while being admitted to your ICU?
5	Are there training programs to be held in your workplace about nutrition?
6	Do you think as a nurse in intensive care unit, you have enough skills to identify malnourished patients?
7	Do you use a guideline in the ICU for screening and evaluating the nutritional status of patients?
8	Are you able to calculate your patient's daily energy and nutrients needs?
9	Do you think, presence of a nutritional support team in the hospital will improve patient's nutritional status and nutritional care?
10	Are you able to screen patients admitted to the ICU at the first step?

ICU: intensive care unit.

Table 4. Questionnaire - Part IV: practice questions

Numbers	Questions
1	What should be the patient's bed position during feeding to reduce the risk of micro-aspiration?
2	What are the symptoms of enteral nutrition intolerance?
3	How is enteral feeding done in critically ill patients?
4	Which method do you use to confirm the correct location of the Feeding Tube?
5	What method do you use to prevent Feeding Tube kinking?
6	Which prokinetic agents are routinely used in your ward? At what dose?
7	Are probiotics routinely used in your ward?
8	Do you routinely use antioxidants, vitamins and trace elements in your ward?
9	Do you have any experience of using Immune-modulating formula in your ward?

related to attitudes, and closed/open questions related to practices. For data validity, the questionnaire was given to 10 members of anesthesia and intensive care medicine, and nutrition departments who had sufficient information in this field. They assessed and reviewed the questionnaire and the reliability was examined. The reliability of the questionnaire was estimated using Cronbach's alpha test.

While one score was given to the correct answers, zero was given to the incorrect ones. In the two-choice questions, which included yes and no, "yes" answers had a score of 2 and "no" answers had a score of zero; and one score was considered for the questions without an answer. The maximum score was 44 and the minimum was zero.

Demographic data and percipients' responses were illustrated by descriptive statistics. Percentages and frequencies were used for the categorical variables; while mean ± standard deviation was calculated for the continuous variables. Fischer's exact test and chi-square test were used to assess the association and differences between categorical variables; and analysis of variance (ANOVA) tests were used to evaluate the relationship between knowledge, attitudes, and practices of ICU nurses with each of the questionnaire variables.

Results

Of the 110 nurses who participated in this study, 76 were female and 34 were male. Table 5 shows their demographic characteristics. The scoring of the questionnaire was based on the type of questions. Levels of knowledge, attitudes, and practices of nurses towards nutritional care in critically ill patients and their relations to their demographic characteristics are shown in Tables 6 and 7.

Discussion

Malnutrition is a growing concern in many hospitalized patients; particularly those admitted in the ICUs.^{7,8} Studies have shown that counseling with nutritionists and the implementation of a variety of nutritional support strategies by the nutrition team in the hospital, especially in the ICU,

reduces the prevalence of malnutrition. The training of nursing staff and monitoring of hospital catering system can be effective approaches to reduce malnutrition.⁹ In nutrition and diet department at Hammersmith Hospital in London during three cross-sectional descriptive studies in 1998, 2000, and 2003; it was found that nutritional counseling and diet therapy strategies in the patients led to a reduction in the prevalence of malnutrition and reduction in weight gain.⁹ Malnutrition continues to be a serious problem in the ICU and is associated with the adverse consequences of the disease. If the nutritional needs of hospitalized patients in the ICUs are properly addressed, the duration of mechanical ventilation can be reduced, leading to fewer complications and faster recovery. According to the ESPEN guideline, if a patient is hospitalized in the ICU for up to 3 days, parenteral nutrition should not be started.¹⁰ Therefore, enteral nutrition is the preferred method of nutrition for hospitalized patients in the ICUs.¹¹ Other studies have shown that the presence

Table 5. Demographic information of nurses

Variable	
Age	31.20±6.11
Gender	
Female	76 (69.09%)
Male	34(30.90%)
Level of education	
Bachelor	89 (80.90%)
MA	10 (9.09%)
PhD	1 (0.90%)
Average work experience in the ICU (year)	3.27± 2.55

ICU: intensive care unit.

Table 6. Level of Knowledge, attitudes and practices of nurses towards nutritional support in critically ill patients

		Total Number	Total Percentage
Knowledge	High (10-14)	81	73.6%
	Medium (5-9)	26	23.2%
	Low (0-4)	3	2.7%
Attitude	Positive (9-18)	64	58.2%
	Negative (0-8)	46	41.8%
Practice	High (9-12)	45	40.9%
	Medium (4-8)	50	45.5%
	Low (0-4)	15	13.6

Table 7. Association between Knowledge, attitudes and practices of nurses and demographic information

	Age	Gender	work experience in the ICU (year)	Level of education
Knowledge	0.005	0.2	0.3	0.001
Attitude	0.03	0.4	0.4	0.003
Practice	0.001	0.5	0.001	0.004

ICU: intensive care unit.

of a nutritionist in the ICU management team leads to increased energy intake, improved nutrition, and reduced ICU stay. Implementation of nutritional programs by a nutritionist can reduce the duration of hospital stay.¹²

In Nightingale and Reeves study with the title of “Knowledge about the assessment and management of undernutrition: a pilot questionnaire in a UK teaching hospital”, the researchers assess 29 doctors, 65 medical students, 45 nurses, 11 dietitians, and 11 pharmacists with a questionnaire of 20 multiple choice questions. Their questions were about nutritional assessment, requirements, and oral/enteral and parenteral nutrition. But in our study, the questionnaire is about all three main purposes; Knowledge, Attitudes, Practices. They explained that the Knowledge about the assessment and management of undernutrition among the participants was poor. On the other hand, in our study high knowledge, moderate practice and positive attitude about nutritional care among ICU nurses were detected.

In another study, Salih assessed knowledge, attitude, and practice concerning nutritional care support among health care providers with their own specific questionnaires. The results showed that a comparable proportion of pharmacists (29.1%) and doctors (31%) had a sufficient knowledge score. Doctors got a higher mean score than the pharmacist and more than a three-quarter of them (80.4%) were congregated in the “average” score group, but Salih showed unclear attitudes to nutritional care support.⁴ Instead, in our study we showed that the surveyed nurses had a high knowledge, moderate practice, and a positive attitude about nutritional care in patients admitted to the ICUs. These differences refer to the variations between the two different health education systems.

Age and the level of education had a significant relationship. Nursing attitude had a significant relationship with age, the level of education; and nursing practice also had a significant relationship with age, work experience in the ICU, and the level of education (P value < 0.05).

We recommend performing other studies on nurses in all the other hospital wards. Given that our hospitals were educational centers, higher nutritional care can be expected compared to other hospitals because of our continuous medical and nursing education. It is also recommended that periodic trainings are better to be given to nurses at regular intervals, taking into account the average practice of nurses; and that nutritional counseling is better to be provided to all patients in the ICU for a better nutritional care.

Conclusion

Our study showed that the surveyed nurses had a high knowledge, moderate practice, and a positive attitude about nutritional care in patients admitted to the ICU.

Conflict of Interest

All authors declare no conflict of interest.

Study Highlights

What is current knowledge?

- Nutrition training in the medical curriculum is contradictory and inadequate.
- Nurses are one of the most reliable sources of nutritional information for patients.
- Nurses surveyed in this study had a high knowledge, moderate practice and a positive attitude about nutritional care in patients admitted to the ICU.

What is new here?

- Thus far, there has been no research on this topic so our study presents a new look at KAP studies .
- and with these results we can conduct training courses about these defects

Ethical Approval

Data collection and analysis were determined by Tabriz University of Medical Sciences of IRAN, ISLAMIC REPUBLIC OF, to be a part of the continual public health investigation and the informed consent form was obtained from the nurses. The informed consent and ethics approval were approved by Regional Research Ethics Committee, Tabriz University of Medical Sciences, by Approval ID: IR.TBZMED.REC.1398.747.

Authors' Contribution

For this descriptive cross sectional study AM. and SHS. contributed in methodology, data collection, conceived and designed the study, and contributed in writing and original draft preparation and supervision; SS. and FM. analyzed the data and edited the draft; MAP conferred in reviewing and editing supervision. All the authors have read and agreed to the published version of the manuscript.

Acknowledgments

The authors wish to thank all the nurses who participated in the study.

Funding

This research received no external funding.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on the reasonable requests.

References

1. Galal O. Nutrition-related health patterns in the Middle East. *Asia Pac J Clin Nutr.* 2003;12(3):337-43.
2. Kondrup J, Allison SP, Elia M, Vellas B, Plauth M. ESPEN guidelines for nutrition screening 2002. *Clin Nutr.* 2003;22(4):415-21. doi: 10.1016/s0261-5614(03)00098-0.
3. Kagansky N, Berner Y, Koren-Morag N, Perelman L, Knobler H, Levy S. Poor nutritional habits are predictors of poor outcome in very old hospitalized patients. *Am J Clin Nutr.* 2005;82(4):784-91; quiz 913-4. doi: 10.1093/

- ajcn/82.4.784.
4. Salih MR. Assessment of knowledge, attitude, and practice concerning nutritional care support among Iraqi health care providers. *Am J Pharm Pharmacol.* 2016;3(5):46-52.
 5. World Health Organization (WHO). *Diet, Nutrition and the Prevention of Chronic Diseases.* Geneva: WHO; 2003. Available from: http://apps.who.int/iris/bitstream/10665/42665/1/WHO_TRS_916.pdf. Accessed September 8, 2016.
 6. Nightingale JM, Reeves J. Knowledge about the assessment and management of undernutrition: a pilot questionnaire in a UK teaching hospital. *Clin Nutr.* 1999;18(1):23-7. doi: 10.1016/s0261-5614(99)80045-4.
 7. de Aguilar-Nascimento JE, Kudsk KA. Early nutritional therapy: the role of enteral and parenteral routes. *Curr Opin Clin Nutr Metab Care.* 2008;11(3):255-60. doi: 10.1097/MCO.0b013e3282fba5c6.
 8. Dvir D, Cohen J, Singer P. Computerized energy balance and complications in critically ill patients: an observational study. *Clin Nutr.* 2006;25(1):37-44. doi: 10.1016/j.clnu.2005.10.010.
 9. O'Flynn J, Peake H, Hickson M, Foster D, Frost G. The prevalence of malnutrition in hospitals can be reduced: results from three consecutive cross-sectional studies. *Clin Nutr.* 2005;24(6):1078-88. doi: 10.1016/j.clnu.2005.08.012.
 10. Kreymann KG, Berger MM, Deutz NE, Hiesmayr M, Jolliet P, Kazandjiev G, et al. ESPEN guidelines on enteral nutrition: intensive care. *Clin Nutr.* 2006;25(2):210-23. doi: 10.1016/j.clnu.2006.01.021.
 11. Wøien H, Bjørk IT. Nutrition of the critically ill patient and effects of implementing a nutritional support algorithm in ICU. *J Clin Nurs.* 2006;15(2):168-77. doi: 10.1111/j.1365-2702.2006.01262.x.
 12. Dupertuis YM, Kossovsky MP, Kyle UG, Raguso CA, Genton L, Pichard C. Food intake in 1707 hospitalised patients: a prospective comprehensive hospital survey. *Clin Nutr.* 2003;22(2):115-23. doi: 10.1054/clnu.2002.0623.