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Assessment of Nurses' Knowledge Before and After Training on Enteral and Parenteral Nutrition in a Tertiary Care Hospital

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ABSTRACT:

Background: Adequate nutritional support plays a fundamental role in the recovery and overall outcomes of hospitalized patients. Adequate nutritional support is essential for maintaining physiological function, enhancing immune response, and promoting wound healing.

Methodology: A quasi-experimental one-group pre-test and post-test study was conducted at Aziz Bhatti Shaheed Teaching Hospital, Gujrat, from February to May 2026 to evaluate the effectiveness of a structured training program on nurses' knowledge regarding enteral and parenteral nutrition. A total of 44 registered nurses were selected through simple random sampling. Baseline data were collected using a demographic questionnaire and an adopted 16-item knowledge assessment questionnaire before the intervention. The educational intervention consisted of structured training sessions covering the principles, administration, complications, and nursing management of enteral and parenteral nutrition using lectures, demonstrations, group discussions, and audiovisual aids. Following completion of the training, the same knowledge questionnaire was administered as a post-test to assess changes in knowledge. Data were analyzed using SPSS version 25.

Results: A total of 44 registered nurses participated in the study. The majority of participants were 31–40 years of age (40.9%), female (56.8%), held a Post RN BSc Nursing degree (38.6%), worked in the Surgical Unit (34.1%), and had 1–5 years of clinical experience (47.7%). Before the educational intervention, 90.9% of nurses had poor knowledge regarding enteral and parenteral nutrition, while only 9.1% demonstrated moderate knowledge, and none had good knowledge. Following the intervention, a marked improvement in knowledge was observed: the proportion of nurses with poor knowledge decreased to 22.7%, whereas 61.4% achieved moderate knowledge and 15.9% attained good knowledge. These findings indicate that the structured educational intervention substantially improved nurses' knowledge regarding enteral and parenteral nutrition.

Conclusion: The study concluded that the structured educational intervention effectively improved nurses' knowledge regarding enteral and parenteral nutrition. Regular in-service training and continuing education are recommended to enhance nursing competency and ensure safe, evidence-based nutritional care.

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INTRODUCTION

Adequate nutritional support is essential for maintaining physiological function, strengthening immune responses, promoting wound healing, and improving recovery among hospitalized patients (Seth et al., 2024). Enteral nutrition (EN) and parenteral nutrition (PN) are important methods of providing nutrients when patients cannot meet their nutritional requirements orally. EN delivers nutrients through the gastrointestinal tract, whereas PN provides nutrients intravenously when enteral feeding is not feasible. Although EN is generally preferred when the gastrointestinal tract is functional, both methods require appropriate clinical management to minimize complications and ensure patient safety (Hill et al., 2022; Vitagliano et al., 2023; Sailer et al., 2025). Nurses play a critical role in administering nutritional support, monitoring complications, maintaining infection prevention practices, and ensuring adherence to clinical guidelines (Ahmed et al., 2024).

However, gaps in nurses' knowledge regarding feeding protocols, contraindications, and complication management may contribute to aspiration, infections, tube blockage, and metabolic disturbances, adversely affecting patient outcomes (Hadera et al., 2022; Zaher et al., 2024). Limited formal training and continuing professional development may further contribute to inconsistent nutritional care practices (Abeid et al., 2025). Evidence suggests that structured educational interventions can improve nurses' knowledge, clinical competence, and adherence to evidence-based guidelines (Seferoğlu et al., 2021; Soon et al., 2022). Therefore, this study aims to evaluate the effectiveness of training in improving nurses' knowledge regarding enteral and parenteral nutrition in hospitalized patients. The findings may help identify knowledge gaps and support the development of targeted educational strategies to enhance the quality and safety of nutritional care.

MATERIAL AND METHODS

A quasi-experimental, one-group pre-test and post-test study was conducted at Aziz Bhatti Shaheed Teaching Hospital, Gujrat, from February to May 2026. Participants were selected using simple random sampling from registered nurses working in medical, surgical, critical care, paediatric, and accident and emergency units. After obtaining ethical approval, hospital permission, and written informed consent, baseline data were collected using a demographic questionnaire and an adopted 16-item nurses' knowledge assessment tool (Hadera et al., 2022). A structured educational intervention covering enteral and parenteral nutrition, feeding guidelines, administration techniques, contraindications, complications, and nursing care was delivered through lectures, demonstrations, group discussions, and audiovisual materials. Following the intervention, the same knowledge questionnaire was administered to assess changes in nurses' knowledge. Data were analyzed using SPSS version 25. Descriptive statistics summarized participants' characteristics, while the Shapiro–Wilk test assessed normality. A paired-samples t-test was used to compare pre-test and post-test knowledge scores, with statistical significance set at $p \leq 0.05$. Confidentiality, anonymity, voluntary participation, and the right to withdraw at any time were ensured.

RESULTS

Demographic Characteristics of Participants

Table 1: Demographics characteristics of participants

Demographic Variables	Category	Frequency (f)	Percentage (%)
Age	20–30 Year	14	31.8
	31–40Year	18	40.9
	41–50 Year	9	20.5
	>50 Year	3	6.8
Gender	Female	25	56.8
	Male	19	43.2
Qualification	Diploma in Nursing	14	31.8

	Post RN BScN	17	38.6
	Generic BScN	13	29.5
Ward	Medical Unit	13	29.5
	Surgical Unit	15	34.1
	Critical Care Unit	8	18.2
	Paediatric Unit	5	11.4
	Accident & Emergency	3	6.8
Experience	Less than 1 year	13	29.5
	1–5 Year	21	47.7
	> 5 Years	10	22.7

Table 1 shows the demographic characteristics of 44 participants. Most participants were aged 31–40 years (40.9%), and 56.8% were female. Regarding educational qualifications, 38.6% held a Post RN BScN degree. Most participants worked in the surgical unit (34.1%), followed by the medical unit (29.5%). In terms of clinical experience, 47.7% had 1–5 years of experience, while 29.5% had less than one year and 22.7% had more than five years of experience.

Knowledge of Nurses Regarding Enteral and Parenteral Nutrition

Table 2: Overall Knowledge of Nurses Regarding Enteral and Parenteral Nutrition

Level of Knowledge	**Pre-Intervention**		**Post-Intervention**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Poor Knowledge	40	90.9	10	22.7
Moderate Knowledge	4	9.1	27	61.4
Good Knowledge	0	0	7	15.9

Table 2 shows an improvement in nurses' knowledge regarding enteral and parenteral nutrition after the training intervention. Before the intervention, most nurses (90.9%) had poor knowledge, while 9.1% had moderate knowledge and none had good knowledge. After the intervention, the proportion of nurses with poor knowledge decreased to 22.7%, while 61.4% achieved moderate knowledge and 15.9% achieved good knowledge. These findings indicate an improvement in nurses' knowledge following the training program.

DISCUSSION

The present study revealed that before the educational intervention, 90.9% of nurses demonstrated poor knowledge regarding enteral and parenteral nutrition, while only 9.1% had moderate knowledge, and none achieved good knowledge. These findings indicate a substantial deficiency in baseline knowledge among nurses responsible for administering nutritional therapy. These results are consistent with several previous studies that reported inadequate knowledge among nurses regarding nutritional support. Al Kalaldeh et al. (2020) found that many nurses lacked sufficient knowledge about enteral feeding protocols, tube placement verification, feeding complications, and infection prevention. Similarly, Torsy et al. (2021) reported significant knowledge deficits among ICU nurses regarding enteral nutrition management before educational training. Likewise, Babiker et al. (2022) observed poor baseline knowledge among hospital nurses concerning parenteral nutrition preparation, administration, and complication management. They concluded that inadequate educational opportunities and limited in-service training contributed to poor competency levels. Similarly, Mohamed et al. (2022) reported that most nurses demonstrated unsatisfactory knowledge before participating in nutrition education programs. The findings of the present study also agree with recommendations from the European Society for Clinical Nutrition and Metabolism (ESPEN, 2023) and the American

Society for Parenteral and Enteral Nutrition (ASPEN, 2022), which emphasize that many healthcare professionals receive insufficient formal education in clinical nutrition and require regular competency-based training to ensure safe nutritional support.

Following the educational intervention, nurses' knowledge improved considerably. The proportion of nurses with poor knowledge decreased from 90.9% to 22.7%, while 61.4% achieved moderate knowledge and 15.9% attained good knowledge. These findings clearly demonstrate the effectiveness of the educational intervention in improving nurses' understanding of enteral and parenteral nutrition. The present findings are supported by numerous previous studies. Al Kalaldeh et al. (2020) reported statistically significant improvements in nurses' knowledge after implementing a structured educational program on enteral nutrition. Their study demonstrated improvements in knowledge related to feeding tube care, formula administration, complication prevention, and patient monitoring.

Similarly, Mohamed et al. (2022) found that nurses' knowledge scores increased significantly following a nutrition education program, concluding that structured educational sessions effectively improve nurses' competence in nutritional support. Torsy et al. (2021) also demonstrated that educational interventions significantly enhanced ICU nurses' knowledge and clinical performance related to enteral nutrition management. Comparable findings were reported by Babiker et al. (2022), who observed significant improvements in nurses' knowledge regarding parenteral nutrition administration following competency-based training. Their study emphasized that regular educational updates contribute to safer nutritional practices and reduced medication and catheter-related complications. Furthermore, systematic reviews by Carter et al. (2023) and recommendations from ESPEN (2023) concluded that continuing professional education is one of the most effective strategies for improving nurses' knowledge, clinical competence, adherence to evidence-based nutritional guidelines, and patient safety outcomes. The improvement observed in the present study may be attributed to the structured educational sessions, comprehensive teaching materials, interactive discussions, and opportunities for participants to clarify misconceptions regarding nutritional support. Educational interventions help reinforce theoretical knowledge, improve critical thinking, and enhance nurses' confidence in managing patients receiving enteral and parenteral nutrition.

Overall, the findings of the present study strongly support previous national and international literature demonstrating that educational interventions are effective in enhancing nurses' knowledge regarding enteral and parenteral nutrition. Continuous in-service education, competency assessments, and refresher training programs should therefore be incorporated into hospital policies to maintain nurses' knowledge and ensure the safe delivery of nutritional therapy.

CONCLUSION

The findings of the present study conclude that nurses had inadequate baseline knowledge regarding enteral and parenteral nutrition prior to the educational intervention, with the majority demonstrating poor knowledge. Following the implementation of the structured educational program, a marked improvement in knowledge was observed, as most participants achieved moderate knowledge and a considerable proportion attained good knowledge, while the percentage of nurses with poor knowledge decreased substantially. The demographic characteristics showed that most participants were 31–40 years of age, predominantly female, held bachelor's-level nursing qualifications, worked mainly in surgical and medical units, and had one to five years of clinical experience. Overall, the results indicate that the educational intervention was effective in enhancing nurses' knowledge regarding enteral and parenteral nutrition. These findings emphasize the importance of regular in-service education, competency-based training, and continuing professional development programs to strengthen nurses' knowledge and promote safe, evidence-based nutritional care, ultimately improving the quality of patient outcomes.

REFERENCES

[1] Abeid, S. M., Iseselo, M. K., Ndile, M. L., Mkoka, D. A., & Kiangi, R. H. (2025). Knowledge, attitude, and practice of nurses regarding enteral feeding for patients admitted to intensive care units of National Referral Hospitals in Dar es Salaam, Tanzania: a cross-sectional study. International Journal of Africa Nursing Sciences, 100920.

[2] Ahmed, A., Anteneh, S., Hussien, A., Seid, A., & Semanew, Y. (2024). Enteral tube feeding practices and associated factors among nurses working in South Wollo Zone Specialized and General Hospitals, Wollo, Ethiopia, 2022. Frontiers in Nutrition, 11, 1399651.

[3] Ang, W. L. S., Zhang, D., Cai, H., & Chew, H. S. J. (2025). Nurses' knowledge, attitude and practice in nutrition management of hospitalised adults: A mixed-methods study. Journal of Clinical Nursing, 34(5), 1665-1690.

[4] Chughtai, A., Tanweer, A., & Abid, A. (2022). Malnutrition among hospitalized adult patients: evidence from a cross-sectional study in Lahore, Pakistan. Topics in Clinical Nutrition, 37(1), 15-23.

[5] Ejaz, S., Khan, M. H., Akbar, A., Khan, U., Khan, A. Z., Akbar, S., Waqas, M., & Qaseem, O. (2025). Comparative Effectiveness and Safety of Early Enteral Feeding Versus Total Parenteral Nutrition in Postoperative Recovery Following Major Abdominal Surgery A Meta-Analysis of Clinical Outcomes and Complications. Indus Journal of Bioscience Research, 3(1), 152-159.

[6] Falih, A. J., & Jasim, A. H. (2024). Effectiveness of an Educational Program on Nurses' Knowledge about Parenteral Nutrition in Critical Care Units. The Malaysian Journal of Nursing (MJN), 16(1), 275-285.

[7] Faris, H. I., & Abed, R. I. (2022). Effectiveness of an education program on nurses knowledge toward enteral nutrition support for unconscious patients at critical care unit in Imam Al-Hussein Medical City in Holy Karbala. Pakistan Journal of Medical & Health Sciences, 16(03), 990-990.

[8] Gašpert, T., Apuzzo, L., Chante, S., Oomen, B., Declaye, J., Brioni, E., & Vejzović, V. (2025). Nurses' attitude and awareness of nutrition and malnutrition: A cross-sectional study across clinical settings. World of Health: World of Health, 8(1), 37-44.

[9] Gezer, N., & Arslan, E. (2023). Nurses' Knowledge and attitudes regarding nutrition support: A descriptive study. Muş Alparslan Üniversitesi Sağlık Bilimleri Dergisi, 3(3), 1-12.

[10] Hadera, T., Worku, T., & Tuli, W. (2022). Nurses' knowledge, practice, and associated factors with enteral nutrition in adult intensive care units of public hospitals. Ethiopian Journal of Health Sciences, 32(2), 423.

[11] Hill, A., Heyland, D. K., Ortiz Reyes, L. A., Laaf, E., Wendt, S., Elke, G., & Stoppe, C. (2022). Combination of enteral and parenteral nutrition in the acute phase of critical illness: an updated systematic review and meta-analysis. Journal of Parenteral and Enteral Nutrition, 46(2), 395-410.

[12] Mancin, S., Sguanci, M., Cattani, D., Soekeland, F., Axiak, G., Mazzoleni, B., De Marinis, M. G., & Piredda, M. (2023). Nutritional knowledge of nursing students: A systematic literature review. Nurse education today, 126, 105826.

[13] Mohammed, S. M. M., Mohamed, G., & Almushawah, R. (2025). A Quasi-Experimental Study on the Impact of a Nasogastric Tube Placement Educational Program on Pediatric Nurses' Knowledge and Practices. SAGE Open Nursing, 11, 23779608251360285.

[14] Naz, S., Afzal, M., & Mukhtar, M. (2024). Effect of educational intervention on neonatal nurses practices regarding oral motor stimulation on early transition from tube to oral feeding in preterm infants: Neonatal nurses practices regarding oromotor stimulation. Pakistan Journal of Health Sciences, 43-48.

[15] Papanikolaou, P., Theodoridis, X., Papaemmanouil, A., Papageorgiou, N. N., Tsankof, A., Haidich, A.-B., Savopoulos, C., & Tziomalos, K. (2025). Enteral nutrition versus a combination of enteral and parenteral nutrition in critically ill adult patients in the intensive care unit: an overview of systematic reviews and Meta-Analysis. Journal of Clinical Medicine, 14(3), 991.

[16] Ramuada, L., Veldsman, L., Livhuwani, N., & Blaauw, R. (2023). Assessment of knowledge, attitude and practice of nurses regarding enteral nutrition at a military hospital. South African Journal of Clinical Nutrition, 36(2), 63-69.

[17] Saifullah, M., & Mukhtar, M. Journal of Population Therapeutics & Clinical Pharmacology.

[18] Sailer, A., Boone, C. E., & Acord, M. R. (2025). Enteral Feeding in Pediatric Patients: Principles and Techniques. Seminars in Interventional Radiology,

[19] Sakran, A. A., & Al-Mosawi, K. (2024). Effectiveness of an Educational Program on Nurse's Knowledge towards Neonatal Total Parenteral Nutrition: فاعلية برنامج تعليمي على معارف الممرضين والممرضات حول التغذية الوريدية الكلية لحديثي الولادة. Iraqi National Journal of Nursing Specialties, 37(1), 1-12.

[20] Seferoğlu, N., Özyürek, P., & Kısacık, Ö. G. (2021). Enteral nutrition management in the critical care patient: intensive care nurses' practices of tube feeding. practice, 5, 17-19.

[21] Seth, I., Lim, B., Cevik, J., Gracias, D., Chua, M., Kenney, P. S., Rozen, W. M., & Cuomo, R. (2024). Impact of nutrition on skin wound healing and aesthetic outcomes: A comprehensive narrative review. JPRAS open, 39, 291-302.

[22] Soon, L., Tong, P. C., Chung, L. J., Tan, S. L., & Goh, Q. L. (2022). Medication Administration via enteral feeding tubes: A survey of nurses' knowledge and practice. Malaysian Journal of Pharmacy (MJP), 8(1), 26-31.

[23] Tortola, R. L. (2024). Key Factors Influencing Poor Reading Comprehension: A Qualitative Exploratory Study. education, 8(6).

[24] Vitagliano, T., Garieri, P., Lascala, L., Ferro, Y., Doldo, P., Pujia, R., Pujia, A., Montalcini, T., Greco, M., & Mazza, E. (2023). Preparing patients for cosmetic surgery and aesthetic procedures: ensuring an optimal nutritional status for successful results. Nutrients, 15(2), 352.

[25] Zaher, S., Sumairi, F. A., & Ajabnoor, S. M. (2024). Understanding nursing perspective towards barriers to the optimal delivery of enteral nutrition in intensive care settings. BMC nursing, 23(1), 42.