

ASSOCIATION BETWEEN NURSES' NUTRITIONAL SUPPORT KNOWLEDGE AND PATIENT CARE PRACTICES IN POST-OPERATIVE CARDIAC UNITS

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DOI: <https://doi.org/10.5281/zenodo.20354230>

Received	Accepted	Published
15 January 2026	27 February 2026	10 March 2026

ABSTRACT

The present study aimed to assess the association between nurses' knowledge regarding nutritional support and their practices in caring for post-operative cardiac patients. Nutritional support is an essential component of postoperative cardiac care because it contributes to wound healing, recovery, prevention of complications, and improvement of patient outcomes. A quantitative descriptive correlational research design was used to conduct the study. The study was carried out among nurses working in cardiac surgical and intensive care units. A non-probability convenience sampling technique was used to select 22 nurses who met the inclusion criteria and agreed to participate in the research. Data were collected using a structured self-administered questionnaire developed according to the objectives of the study and relevant literature. The instrument consisted of three sections including demographic characteristics, nurses' knowledge regarding nutritional support, and nursing practices related to nutritional care for post-operative cardiac patients. The collected data were analyzed using the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics including frequency, percentage, mean, standard deviation, minimum, and maximum values were used to summarize demographic variables, knowledge scores, and practice scores. Inferential statistics using Pearson correlation analysis were applied to determine the association between nurses' knowledge and practices. The findings revealed that nurses had relatively adequate knowledge regarding nutritional support, while practice scores showed variability among participants. A statistically significant moderate positive correlation was found between knowledge and practice ($r = .505$, $p = .017$), indicating that higher knowledge levels were associated with better nursing practices. The study concluded that improving nurses' knowledge may positively influence nutritional support practices in post-operative cardiac care. The study recommends continuous educational programs, evidence-based training workshops,

standardized nutritional care protocols, and multidisciplinary collaboration to enhance nurses' competencies and improve patient outcomes in cardiac surgical units.

Keywords: Nurses' knowledge; nutritional support; nursing practices; post-operative cardiac patients; cardiac surgery; post-operative care.

INTRODUCTION

Post-operative cardiac patients require careful and continuous nursing care. Cardiac surgery is a major physiological stress on the body and increases the risk of complications such as infection, delayed wound healing, prolonged mechanical ventilation, poor recovery and prolonged hospital stay. Nutritional support is an important component of post-operative care as adequate energy, protein, fluid and micronutrient intake supports tissue repair, immune function, muscle strength and overall recovery. Recent evidence suggests that malnutrition and underfeeding are still prevalent in patients undergoing cardiac surgery and can negatively influence post-operative outcomes, especially in critically ill and elderly patients (Shadnoush et al., 2026). The 2025 ESPEN guideline also highlights the importance of the inclusion of nutritional care in the overall surgical management, early reestablishment of oral feeding and early start of nutritional therapy when the nutritional risk is identified (ESPEN, 2025). Similarly, ASPEN identified adult perioperative cardiac patients as a high-risk group for underfeeding and delayed medical nutrition therapy, highlighting the need for structured nutritional support in the pre-operative and post-operative periods (ASPEN, 2025).

Nurses are in a unique position to provide nutritional support because they are in direct contact with the post-operative cardiac patient throughout the hospital stay and are responsible for monitoring intake, observing feeding tolerance, identifying complications, supporting enteral or parenteral nutrition, documenting nutritional status, and communicating patient needs to physicians and dietitians. So, the quality of bedside practice delivered is influenced by the nurses' knowledge of nutritional support. A recent study has shown that early nutritional support nursing interventions can reduce the time on mechanical ventilation and the length of hospital

stay for critical cardiac surgery patients, emphasizing the importance of nursing involvement in nutritional care (Effect of Early Nutritional Support Nursing Intervention, 2026). Similarly, Ahmad (2025) in a 2025 study on CABG post-operative care concluded that the assessment of nurses' knowledge is needed to identify knowledge gaps and improve patient-centered care. These findings imply that nurses need adequate knowledge and practical competence to provide safe and effective nutritional support for post-operative cardiac patients.

Post cardiac surgical nutritional problems can be caused by surgical stress, inflammation, reduced appetite, delayed oral intake, fluid restriction, gastrointestinal intolerance and increased metabolic demand. A prospective observational study of patients undergoing cardiac surgery found common perioperative protein deficits and recommended early nutritional intervention to reduce malnutrition and optimize recovery (Perioperative Nutritional Status in Cardiac Surgery Patients, 2025). In addition, recent evidence on the prognostic nutritional index has shown that the nutritional and inflammatory status are useful markers to predict outcomes after cardiac surgery (Predictive Value of Postoperative Prognostic Nutritional Index Trajectory 2025). The studies show that nutritional support is not a secondary aspect of care, but an essential component of post-operative cardiac recovery.

Despite the importance of nutritional care, research continues to find gaps between knowledge and its application in clinical practice. Nurses may be aware of the importance of nutritional support, but they may not always implement this knowledge because of workload, lack of training, absence of protocols, limited dietitian support or poor institutional supervision. Research on current nutrition therapy practices in cardiac surgery patients found that there is a need

for improvement in intensive care units, and knowledge transfer is important for improving nutrition practices (Singer et al., 2025). The ASPEN guideline protocol also emphasizes that cardiac surgery patients are often behind in medical nutrition therapy and have lower nutritional adequacy than other ICU patients (ASPEN, 2025). This means that knowledge alone may not be sufficient and should be backed up by evidence-based protocols, continuing education and multidisciplinary collaboration.

The present study was carried out to assess the relationship between nurses' knowledge of nutritional support and practice in caring for post-operative cardiac patients. Nurses in this study had adequate knowledge, but practice scores showed more variation. The correlation result revealed a statistically significant moderate positive association between knowledge and practice which means that nurses with better knowledge were more likely to show better nutritional care practices. This supports the necessity of continuous professional education, practical training and nutritional care guidelines in cardiac surgical units. Knowing this association is important because it can lead to better recovery, fewer complications, shorter hospitalization, and improved quality of care for post-operative cardiac patients through improving nurses' knowledge and strengthening clinical practice.

Problem Statement

Post-operative cardiac patients are at very high risk for malnutrition and delayed recovery due to increased metabolic demands, surgical stress, prolonged mechanical ventilation and inadequate nutritional intake. Appropriate nutritional support is an essential component of post-operative cardiac care because it plays a role in wound healing, immune function, reduced infection rates and shorter hospital stays. Recent evidence shows that delayed or inadequate nutritional management in patients undergoing cardiac surgery is associated with prolonged intensive care unit (ICU) stay, higher complications and higher mortality rates (ESPEN, 2025; ASPEN, 2025). Nurses have a key role in nutritional support: assessing patients, monitoring enteral or parenteral feeding and ensuring

compliance with nutritional protocols. However, knowledge deficits in nurses and inconsistency in nutritional care practices are major concerns in cardiac care settings (Singer et al., 2025; Shadnough et al., 2026).

Although perioperative nutrition guidelines have improved, studies continue to show suboptimal application of evidence-based nutritional practices by healthcare professionals involved in the care of patients undergoing cardiac surgery. According to research, lack of knowledge about nutritional support can impact nurses' clinical practices and eventually affect patient outcomes (Al-Jubouri et al., 2025). The international guidelines also highlight that multidisciplinary nutritional management and continuous nursing education are needed for the improvement of quality of postoperative care (ESPEN, 2025). There is little research on the relationship between nurses' knowledge and the actual practice of caring for post-operative cardiac patients. The importance of nutritional support has been recognized increasingly in critical care and cardiac surgery. Therefore, this association needs to be explored to identify educational gaps and to improve evidence based nursing practices in cardiac surgical units.

Research Objectives

To assess the association between nurses' knowledge regarding nutritional support and their practices in caring for post-operative cardiac patients.

Research Question:

Is there a significant association between nurses' knowledge regarding nutritional support and their practices in caring for post-operative cardiac patients?

Hypothesis:

H0: There is no significant association between nurses' knowledge regarding nutritional support and their practices in caring for post-operative cardiac patients.

H2: There is a significant association between nurses' knowledge regarding nutritional support and their practices in caring for post-operative cardiac patients.

Literature Review

Nutritional support is an essential component of post-operative cardiac care because cardiac surgery patients commonly experience increased metabolic demand, inflammation, reduced appetite, fluid restrictions, and delayed oral intake after surgery. Recent literature shows that malnutrition remains a major risk factor in adult cardiac surgery and may contribute to infection, delayed wound healing, prolonged ventilation, and mortality (Shadnough et al., 2026). Shadnough et al. (2026) also emphasized that early screening and intervention are critical, and early enteral nutrition within 12–24 hours is commonly recommended when clinically appropriate. Similarly, the ESPEN guideline on clinical nutrition in surgery highlights the importance of integrating nutritional care into perioperative management and includes recommendations related to frailty assessment, sarcopenia diagnosis, prehabilitation, and early nutrition therapy (Weimann et al., 2025). These findings indicate that nutrition should not be considered a secondary part of care but a key element of post-operative recovery in cardiac surgical patients. Recent studies have also demonstrated that many cardiac surgery patients fail to meet recommended nutritional requirements after surgery. Liang et al. (2026) conducted a multicenter observational study among cardiac surgery patients and found that the average protein intake during the first seven post-operative days was below recommended levels, with only a small proportion of patients meeting the target intake. The study further identified advanced age and elevated white blood cell count as risk factors for malnutrition, while oral nutritional supplements were found to be protective (Liang et al., 2026). In another study, Bae et al. (2025) reported that the prognostic nutritional index, which reflects both nutritional and inflammatory status, is useful in predicting mortality outcomes after off-pump coronary artery bypass surgery. These findings show that nutritional status has a direct relationship with recovery and survival among post-operative cardiac patients.

Nurses have a central role in nutritional support because they are continuously involved in patient

monitoring, assessment, feeding assistance, documentation, and communication with the multidisciplinary team. Ahmad (2025) noted that nurses caring for CABG patients face challenges such as knowledge gaps, inadequate resources, and insufficient training, which can negatively affect the quality of post-operative care. The same study emphasized that evaluating nurses' understanding is important for identifying areas requiring improvement and strengthening patient-centered care. Matthews et al. (2026), in a systematic review of nurse-led post-operative interventions in adult cardiac surgery, found that nurse-led interventions were generally feasible, safe, and beneficial for patient comfort, physiological stability, symptom relief, and functional recovery. These findings support the importance of strengthening nursing knowledge and practice in cardiac surgical units. Knowledge regarding nutritional support is particularly important because nurses must recognize nutritional risk, monitor feeding tolerance, identify complications, and follow evidence-based protocols. The ASPEN protocol for adult perioperative cardiac patients states that cardiac surgery patients are at increased risk of iatrogenic underfeeding and often experience delays in medical nutrition therapy compared with other critically ill patients (American Society for Parenteral and Enteral Nutrition [ASPEN], 2025). Singer et al. (2025) also reported that improvements in medical nutrition therapy practices are needed in intensive care units caring for cardiac surgery patients, and that appropriately staffed dietetic services are important for transferring nutritional knowledge into practice. This suggests that nursing practice is influenced not only by individual knowledge but also by institutional support, dietitian availability, staffing, and clinical guidelines.

Evidence further supports the value of early nutritional interventions in improving post-operative outcomes. Shi et al. (2025), in a meta-analysis, found that early nurse-initiated enteral nutrition can improve post-operative recovery and reduce complications across surgical populations, including cardiac surgery-related groups. Another 2026 review in *Journal of PeriAnesthesia Nursing* reported that early nutritional support

nursing interventions can reduce mechanical ventilation duration and hospital length of stay among critical cardiac surgery patients. These findings show that nurses' practices related to early feeding, assessment, and monitoring can influence important clinical outcomes. Therefore, improving nurses' knowledge of nutritional support may lead to better clinical practice and improved recovery in post-operative cardiac patients.

The reviewed literature supports the present study, which examined the association between nurses' knowledge regarding nutritional support and their practices in caring for post-operative cardiac patients. The current study found a statistically significant moderate positive relationship between knowledge and practice, indicating that nurses with higher knowledge scores were more likely to demonstrate better nutritional care practices. This finding is consistent with recent literature showing that knowledge, training, protocols, and multidisciplinary collaboration are necessary for effective nutritional management in cardiac surgery settings. However, the moderate strength of the relationship also suggests that practice may be influenced by other factors such as workload, lack of resources, limited supervision, and absence of standardized nutritional care guidelines. Therefore, continuous education, competency-based training, and institutional support are needed to improve nurses' nutritional support practices in post-operative cardiac care.

Research Methodology

Research Design

The current study employed a quantitative descriptive correlational research design to determine the relationship between nurses' knowledge on nutritional support and their practices in caring for post-operative cardiac patients. A descriptive correlational design was appropriate since the study sought to establish the relationship between two variables without manipulating them. The design allowed the researcher to collect quantitative data about nurses' demographic characteristics, knowledge and practices and statistically analyse the association between knowledge and practice

scores. It also helped in understanding the current nursing competencies and the areas for improvement in the nutritional support practices in the cardiac surgical units.

Sampling Techniques

Participants were selected from the target population using a non-probability convenience sampling technique in this study. The study included nurses who were directly involved in the care of post-operative cardiac patients and were available during the data collection period. The research involved a total of 22 nurses. Convenience sampling was utilized due to the ease of accessibility to participants in the chosen healthcare setting, and the feasibility of data collection within the time and resources available. Inclusion criteria were registered nurses who worked in cardiac surgical or intensive care units and who agreed to participate voluntarily in the study

Research Instrument:

Structured self-administered questionnaire developed from relevant literature and study objectives was used for data collection. The questionnaire was divided into three parts: demographic characteristics, knowledge on nutritional support for post-operative cardiac patients and nursing practices in nutritional care. The demographic section of the questionnaire includes variables such as gender, age, qualification, experience, and training. The knowledge part assessed the nurses' knowledge about the principles of nutritional support, and the practice part explored their clinical nutritional care. The questionnaire was designed in simple language to give clarity and ease of understanding. Statistical analysis Descriptive and inferential statistics were used to analyze the relationship between knowledge and practice.

Ethical Consideration

The research process was strictly in accordance with the ethical principles. Prior to data collection, appropriate permission was obtained from the respective hospital administration and institutional authority. All nurses were informed and gave informed consent to participate in the

study. The aim and objectives of the study were explained to the participants. Participation was on voluntary basis and participants were assured of confidentiality and anonymity of responses. The nurses were also informed that they had the right to withdraw from the study at any stage with no penalty or consequences. Data collected were used for research purpose only, and stored in a secure manner to protect participants' privacy and confidentiality.

Data Analysis

The collected data will be analyzed using Statistical

Package for Social Sciences (SPSS) software.

Descriptive statistics such as frequencies, percentages, mean, and standard deviation were used to summarize demographic characteristics and knowledge scores.

Inferential statistical tests such as Chi-square tests may be used to determine associations between demographic variables and nurses' knowledge levels. Results will be presented in tables, charts, and graphs for better understanding and interpretation.

Data Analysis

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Gender	22	1	2	1.55	.510
Age	22	1	4	1.68	.839
Qualification	22	1	3	2.00	1.024
Experience	22	1	3	1.64	.902
Training	22	1	2	1.45	.510
Knowledge	22	5.00	6.00	5.2727	.45584
Practice	22	5.00	12.00	7.4545	2.53973
Valid N (listwise)	22				

Table 1 presents the descriptive statistics of the variables of the study among 22 nurses. The demographic results indicate that gender had a mean score of 1.55 and a standard deviation of 0.510. This shows that both gender categories were represented. Age ranged from category 1 to 4 with a mean of 1.68 and standard deviation of 0.839 which shows that most of the participants were in the lower age categories. The qualification ranged from 1 to 3, with a mean score of 2.00 and a standard deviation of 1.024, showing variation in educational level among nurses. The mean score of Experience was 1.64 with a standard deviation of 0.902, suggesting that most participants had relatively lower to moderate levels of experience. Training ranged from 1 to 2 with mean of 1.45 and standard deviation of 0.510 showing that training exposure varied among the nurses.

Concerning the main study variables; the nurses' knowledge scores ranged from 5.00 to 6.00 with a mean of 5.27 and standard deviation of 0.456. This means that the nurses had a relatively high and consistent level of knowledge on nutritional support for post-operative cardiac patients. Practice scores ranged from 5.00 to 12.00 with a mean of 7.45 and a standard deviation of 2.540 indicating more variability in nurses' practices than in their knowledge. The knowledge scores were clustered around the mean while the practice scores were more spread out. This suggests that good knowledge may not always translate equally into clinical practice. In general, descriptive results show that nurses had an adequate level of knowledge, but practices related to nutritional support were variable, suggesting the need for ongoing training and supervision in post-operative cardiac care.

Table 2:Correlations

		Knowledge	Practice
Knowledge	Pearson Correlation	1	.505*
	Sig. (2-tailed)		.017
	N	22	22
Practice	Pearson Correlation	.505*	1
	Sig. (2-tailed)	.017	
	N	22	22

Correlation is significant at the 0.05 level (2-tailed).

Table 2: Pearson correlation analysis between the nurse's knowledge and practice regarding nutritional support for post-operative cardiac patients. The results showed significant positive correlation between the knowledge and practice scores ($r = .505$, $p = .017$). This indicates a moderate positive correlation, indicating that an increase in nurses' knowledge of nutritional support is likely to be related to an increase in their clinical practices. The p value of .017 is less than the conventional alpha level of .05, indicating that the relationship between knowledge and practice is statistically significant. Therefore, the study findings support the alternate hypothesis that there is a significant association between nurses' knowledge and their practices in caring for post-operative cardiac patients.

The results of the correlation indicated that nurses with a better understanding and awareness of nutritional support were more likely to use appropriate nutritional care practices in clinical settings. Adequate knowledge may contribute to better assessment, monitoring and implementation of nutritional interventions for post-operative cardiac patients. Ultimately improving patient outcomes. While the relationship was moderate rather than strong, the findings highlight the value of educational programs, ongoing professional development and training opportunities for enhancing nurses' competencies in nutritional support. Evidence-based training can be beneficial to improve the quality of postoperative cardiac care and influence the clinical practices of nurses.

Discussion:

The purpose of the present study was to investigate the association between the nurses' knowledge about nutritional support and their practice in post-operative care of cardiac patients. The results showed that nurses had relatively adequate knowledge about nutritional support as indicated by the high mean knowledge score. However, nurses' practice scores were mixed indicating inconsistency in the implementation of nutritional care interventions. The results indicate that nurses may possess adequate theoretical knowledge regarding nutritional support, but this knowledge may not always translate effectively into clinical practice. Shadnoush et al. (2026) reported similar findings and highlighted the fact that nutritional management is still inconsistently applied in post-operative cardiac care, despite the increasing evidence of its importance. Recent studies have associated suboptimal nutritional practices in cardiac surgical patients with delayed wound healing, longer hospitalization, increased risk of infection and higher morbidity rates (ESPEN, 2025; ASPEN, 2025). Furthermore, Juliana et al. (2025) revealed that early and evidence-based nutritional interventions improve recovery outcomes and reduce complications significantly in critically ill cardiac patients. These findings underscore the importance of optimizing nutritional support practice in cardiac surgical units.

The correlation analysis of the current study revealed a statistically significant moderate positive correlation between knowledge and practices of nurses towards nutritional support ($r = .505$, $p = .017$). This finding shows that nurses

with better nutritional knowledge are more likely to use better clinical practices in the management of post-operative cardiac patients. These results are consistent with the study of Singer et al. (2025) who found that health professionals with sufficient nutritional knowledge were more likely to adhere to evidence-based nutritional guidelines and to practice effective patient-centered nutritional care. Al-Jubouri et al. (2025) also reported a positive impact of educational competency and professional training on nurses' practices in postoperative care in cardiac intensive care settings. Existing data also suggest that ongoing nursing education and competency-based training programs enhance nurses' confidence in nutritional assessment, management of enteral feeding, and monitoring of postoperative patients (ESPEN, 2025). Thus, enhancing nurses' nutritional knowledge can significantly contribute to the improvement of nursing care quality and patient outcomes in cardiac surgery units.

However, the moderate strength of the correlation suggests that nurses' practices may be influenced by factors other than knowledge, although a positive association was found in the study. Potential barriers may be high workload, lack of availability of nutritional protocols, lack of institutional support, staff shortages and lack of interdisciplinary collaboration. ASPEN (2025) stressed that successful nutritional support relies on coordinated multidisciplinary teamwork and continuous professional development among health care providers. Similarly, Frontiers in Nutrition (2025) pointed out that poor staffing and lack of nutrition education continue to be significant barriers to the implementation of evidence-based nutritional practices in critical care settings. The findings of the current study highlight the need for healthcare institutions to provide regular educational workshops, develop uniform nutritional care protocols, and promote a collaborative approach to nutritional management in cardiac units. Continuous training and supervision of nurses can improve practical skills, which can lead to better compliance with nutritional guidelines and better recovery outcomes for post-operative cardiac patients.

Conclusion

The present study concluded that the nurses caring for post-operative cardiac patients had relatively adequate knowledge regarding nutritional support but variations were observed in their clinical practices. The results showed that there was a moderate positive relationship between nurses' knowledge and practices which was statistically significant and improving knowledge leads to better implementation of nutritional care practices. These findings highlight the important role of nursing knowledge in effective nutritional management and recovery of post-operative cardiac patients. Proper nutritional support is essential in cardiac care units to reduce complications, improve wound healing, shorten hospital stay, and improve patient outcomes.

The study also highlights the importance of continuous educational programs, evidence-based training, and standardized nutritional care protocols to enhance nurses' competencies in nutritional support. Although nurses had acceptable knowledge levels, practice variation suggests that other factors may affect the implementation of practice including workload, institutional support and availability of clinical guidelines. Therefore, healthcare institutions should focus on regular training workshops, multidisciplinary collaboration, and supportive supervision to improve the nutritional care practices of nurses. Enhancing the practical and theoretical competencies of nurses could ultimately lead to better quality of postoperative cardiac care and better outcomes in patient recovery.

Recommendations:

- Conduct regular educational and training programs for nurses regarding evidence-based nutritional support for post-operative cardiac patients.
- Develop and implement standardized nutritional care protocols and guidelines in cardiac surgical units to improve consistency in nursing practices.
- Encourage multidisciplinary collaboration among nurses, dietitians, physicians, and other healthcare professionals to enhance nutritional management and patient outcomes.

- Provide continuous clinical supervision and competency assessments to ensure proper implementation of nutritional support practices in postoperative cardiac care.

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