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Original Article

Evaluating Nurses Understanding of Postoperative Care in CABG Patients: Implications for Practice

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Abstract *- This research identifies major knowledge gaps among nurses in postoperative CABG patient care, especially in pain management, monitoring of vital signs, and identification of complications. It revealed that 58.2% of the nurses had not undergone specialized training in CABG care. Knowledge was highly variable, with some nurses suggesting infrequent monitoring of vital signs and others suggesting more frequent monitoring. Although nurses were familiar with chest pain as a symptom of MI, they were less familiar with headaches or increased temperature. Gaps in knowledge of infection control, anticoagulant therapy, and respiratory care were also recognized. The research underlines the importance of special training programs to enhance nurses' knowledge in these crucial areas. An interdisciplinary approach, including cardiologists, nurses, and other experts, along with standardized protocols, is vital to increase patient care and recovery. Continuous professional development is required to provide quality care to CABG patients.*

Keywords *- CABG, CVDs, CCU, ICU, MI.*

1. Introduction

Cardiovascular Diseases (CVDs) are a significant global health challenge. In 2015, the World Health Organization (WHO) reported that approximately 17.7 million people died from CVDs, accounting for 31% of all global deaths (WHO, 2018). The burden is especially high in low- and middle-income countries, where healthcare resources are often limited. In the Southeast Asian region, the mortality rate from CVDs increased by 1.8 million between 2000 and 2012, rising from 6.7 million to 8.5 million (WHO, 2014). In the United States, the prevalence of heart disease has affected approximately 85.6 million adults (American Heart Association, 2018; Nishimura *et al*., 2017).

Coronary Artery Bypass Grafting (CABG), commonly known as heart bypass surgery, is a crucial procedure aimed at improving blood flow to the heart when coronary arteries become narrowed or blocked. This procedure involves taking healthy blood vessels, typically from the arm, chest, or leg, and using them to bypass blocked or narrowed coronary arteries, creating a new route for blood to flow to the heart muscle. CABG may be performed through traditional "open heart" surgery, where the heart is temporarily stopped, or through "off-pump" procedures, where the heart continues to beat during the surgery. (Cohn & Shumway (2008)).

CABG remains one of the most commonly performed cardiac surgeries worldwide, with approximately 200,000 isolated cases annually in the United States and an incidence rate of 62 per 100,000 inhabitants in Western European countries. American Heart Association. (2020). The history of CABG has evolved significantly, spanning three distinct eras:

1. Early Experimental Phase (up to the 1960s) – characterized by initial, often rudimentary attempts and some impressive early clinical results.
2. Development of Modern Techniques—focusing on testing grafts and standardizing the procedure, laying the foundation for evidence-based cardiac surgery.
3. Minimally Invasive Surgery and Integration with Interventional Medicine—evolving in the 21st century with advancements in technology and collaboration between surgical and interventional approaches.

In Pakistan, coronary artery disease is a leading cause of death, with 108,237 deaths attributed to it annually, accounting for 24.15% of all fatalities. Lahore, specifically, has one of the highest mortality rates, with 189.37 deaths per 100,000 people, ranking it 23rd globally (Bahreini et al., 2020). With the increasing incidence of coronary artery disease, the demand for CABG procedures has risen significantly.

After CABG surgery, patients are usually moved straight from the operating room to the Intensive Care Unit (ICU) or Cardiac Care Unit (CCU). Here, they begin to wake up as the anaesthesia wears off. At first, they might have trouble moving their limbs because of the medications used during the

surgery, but most start recovering fairly quickly. The first few hours after the surgery are particularly important because patients can experience a range of complications that can change quickly, making it a critical time for close monitoring and care.

In the ICU, patients are closely monitored for complications such as arrhythmias, blood pressure instability, and hemodynamic changes. Initial management is vital and includes reviewing preoperative data, comorbidities, and medications, as well as conducting a thorough physical examination. Key areas of monitoring include heart rate and rhythm, blood pressure, temperature, neurological status, ventilator support, and chest drainage Mack & Blankenhorn, 2011.

After CABG surgery, nurses are really at the heart of the recovery process. They make sure wounds are properly taken care of, pain is managed well, and patients know exactly what they need to do as they recover. Pain control is a big focus because if pain is not treated, it can lead to other problems like blood clots, lung issues, or even chronic pain, which can slow down healing. Wound care is just as important to avoid infections and help the body heal. Nurses also spend time talking to patients and their families, teaching them how to take care of themselves once they are home so they feel confident and supported through the whole recovery journey. However, despite the importance of these responsibilities, many nurses face challenges such as knowledge gaps, inadequate resources, and insufficient training. These issues can negatively affect the quality of care provided to CABG patients (Corregidor-Sánchez *et al*., 2021; Bahrami *et al*., 2014). Nurses' understanding of postoperative care is essential for ensuring the best outcomes for CABG patients.

Research indicates that despite the critical role of nurses in postoperative care, there are gaps in their knowledge and understanding of best practices. Factors such as limited training opportunities, resource constraints, and cultural barriers may hinder effective care. Studies have highlighted that tailored educational programs, considering factors like patient culture, language, and literacy levels, are vital for improving self-care practices and patient outcomes (Kahook *et al*., 2019; Pihlaja *et al*., 2018).

Evaluating nurses' understanding of postoperative care for CABG patients is crucial in identifying areas for improvement. Such evaluations can help optimize nursing education, improve clinical outcomes, and enhance patient-centered care. By addressing gaps in nurses' knowledge, healthcare institutions can ensure that CABG patients receive the best possible care throughout their recovery. Farkouh, M. E., Domanski, M., & Xie, J. (2018)

The findings of this evaluation will have significant implications for nursing practice. Improving nurses' knowledge and skills in postoperative care will not only enhance the quality of care but also contribute to better patient outcomes. It will also inform nursing education, ensuring that nurses are well-prepared to manage the complex needs of CABG patients. Furthermore, addressing the challenges faced by nurses, particularly in resource-constrained settings, will help bridge the gap in care delivery and ensure that all CABG patients receive optimal care. Hochberg, (2019) Coronary artery disease and CABG surgery present significant challenges for healthcare systems, especially in regions with limited resources. Nurses play a vital role in the recovery of CABG patients, but gaps in their knowledge and skills must be addressed to improve patient outcomes. This study aims to evaluate nurses' understanding of postoperative care for CABG patients, with a focus on identifying areas for improvement in education and practice. By enhancing nursing expertise in this area, we can improve recovery outcomes for CABG patients and contribute to the advancement of patient-centered care in the context of cardiovascular surgery. Liaw, & O'Rourke, (2020).

2. Methodology

2.1. Study Design

This was a descriptive, cross-sectional study aimed at assessing nurses' knowledge of postoperative care for CABG patients. The design allowed for the collection of data from a large number of nurses at one time, providing an overview of their current knowledge and practices regarding CABG recovery.

2.2. Study Population

The study targeted registered nurses working in the Cardiac Care Unit (CCU) or Intensive Care Unit (ICU) at hospitals performing CABG surgeries. Nurses with varying experience levels (from newly qualified to those with over five years of experience) were included to evaluate the influence of experience on knowledge. The inclusion criteria were:

- Registered nurses involved in CABG patient care
- Nurses with at least six months of experience in CCU/ICU
- Nurses who consented to participate
- Final-year BSN students

2.3. Data Collection Methods

- A structured questionnaire was developed to assess nurses' knowledge of key postoperative care areas (pain management, complication monitoring, patient education, etc.). It included both closed and open-ended questions.

2.4. Data Analysis

2.4.1. Quantitative Data

Descriptive statistics (mean, median, standard deviation) were used to determine overall knowledge levels. Inferential tests (e.g., chi-square, t-tests) compared knowledge across

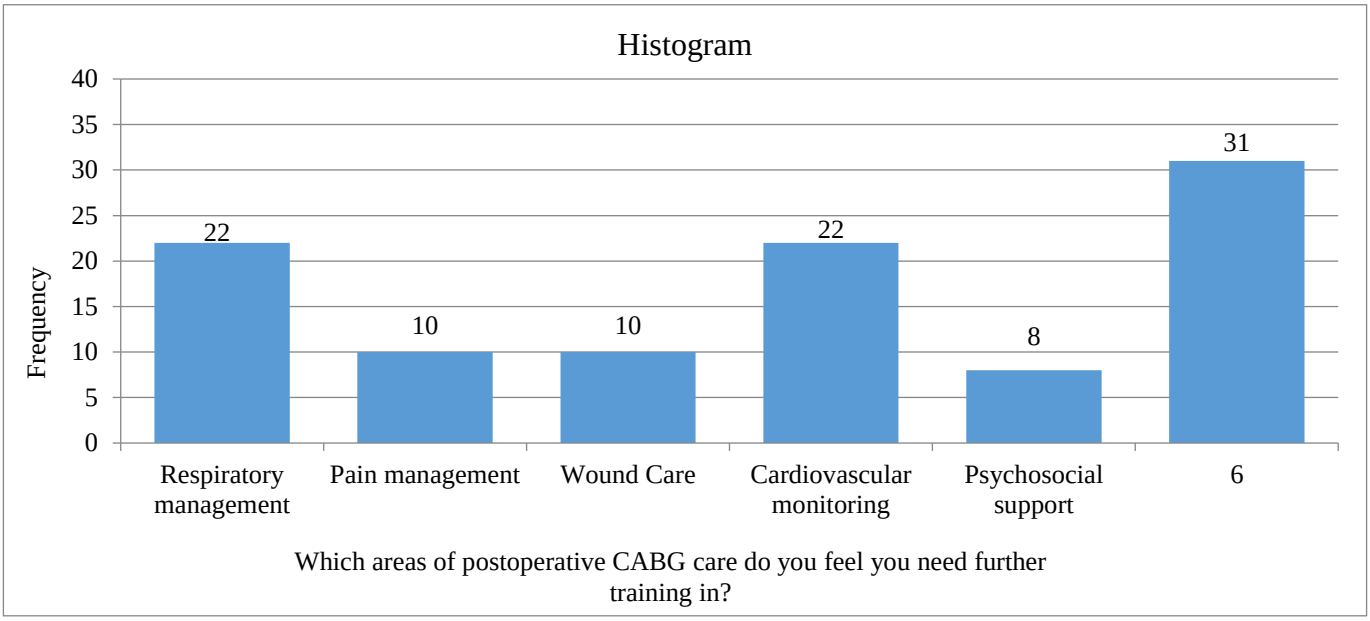
demographic groups (e.g., years of experience). Data were analyzed using SPSS (Version 26).

Categorical variables were estimated as frequencies and percentages, while continuous variables were analyzed using means and standard deviations.

3. Result

Which areas of postoperative CABG care do you feel you need further training in?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Respiratory management	22	21.4	21.4	21.4
	Pain management	10	9.7	9.7	31.1
	Wound Care	10	9.7	9.7	40.8
	Cardiovascular monitoring	22	21.4	21.4	62.1
	Psychosocial support	8	7.8	7.8	69.9
	6.00	31	30.1	30.1	100.0
	Total	103	100.0	100.0	



The findings point to a number of areas, such as respiratory management, cardiovascular monitoring, pain management, wound care, and psychosocial support, where medical professionals believe they require additional training in order to give postoperative CABG patients the best care possible. Crucially, a thorough, multidisciplinary training program that addresses these different areas could greatly improve the quality of care.

4. Discussion

The focus of this paper is to critically evaluate the knowledge, experiences, and practices that nurses have when directly involved in patient care after CABG surgery. CABG is a major surgical procedure aimed at directly improving blood flow towards the heart, and postoperative care ensures that optimal recovery is gained. At the same time, complications are kept at a minimum level. The frontline care providers, who are the nurses, are vital in the recovery of these patients. Thus, understanding their training, knowledge, and practices will be very crucial in improving the quality of care and patient outcomes. The objective of this study was to evaluate these aspects within a sample of nurses working in various intensive care and surgical settings and identify gaps in knowledge and practices that may potentially affect patient care.

The sample is highly biased towards the younger population because 90.9% of the sample is under 25 years of age, and there is no representation from the 36–45 age group. Although this could be useful to give insight into the youths' perspectives, there are extreme limitations on extrapolating the findings to the whole population. Gender distribution The gender distribution in the sample is skewed considerably in

favour of females since 74.5% are females. Years of nursing experience indicate a significant bias toward early career nurses, where 98.2% of respondents have less than five years of experience. The lack of numbers is due to those having more than 10 years of experience, thereby limiting the collection of opinions from experienced professionals. Most of the respondents are intensive care unit nurses (58.2%), followed by general surgical ward nurses (34.5%), and the remaining percentage is from the critical care unit (7.3%). This distribution skews the result towards the experiences of critical care nurses and limits the views of nurses who work in a specialized or lesser degree of acuity setting.

The study revealed that 41.8% had received postoperative care training after CABG, whereas 58.2% reported that they had never received such training. Therefore, it suggests that nurses are not likely to have had specialized training; hence, there could be an impairment in the care quality provided during recovery after the CABG operation.

Future initiatives should look at increasing the training opportunities that will ensure all the nurses working with CABG patients have acquired the skills and knowledge necessary for delivering the best care possible that will enhance patient outcomes and safety.

47.3 percent of respondents affirmed that the critical signs must be checked every 15 minutes for the first 24 hours, according to a survey on the time interval for checking vital signs on postoperative CABG patients. In general, 9.1 percent answered that monitoring must be conducted every four hours, and 43.7 percent that it should be done every hour or every 30 minutes. These findings are in line with clinical best practices, primarily in critical care settings where early postoperative surveillance is crucial. However, differences in response require uniform practices, training, and customized monitoring programs according to patient conditions and available resources at hospitals.

According to available clinical experience, 81.8% of respondents answered that chest pain is indicative of an MI in those patients who have undergone CABG surgery, based on the survey result. However, a smaller number of respondents incorrectly responded that headaches, elevated body temperature, and polyuria could present as early features of MI. These results emphasize the need to enhance accurate symptom evaluation and to distinguish between possible cardiac conditions and postoperative complications. In patients undergoing CABG, enhanced clinical judgment and education regarding myocardial infarction symptoms may help ensure timely interventions and improved outcomes. This study is correlated with (Martin 2006).

The results of the study also include the following key measures in monitoring graft performance after CABG: heart rate, 32.7%; blood pressure, 34.5%; oxygen saturation, 30.9%. These measures are highly related to graft performance because these ensure that all goes well with cardiac perfusion and patency of the graft. A lesser direct measure would include urine output. These findings highlight the importance of closely monitoring critical cardiovascular parameters throughout the early postoperative period to identify any potential issues so that they may be addressed immediately. If medical professionals are aware of what is included in crucial parameters to be monitored after CABG surgery, then outcomes will improve in patients.

This study is correlated with (Eldin 2021). The sterile approach was ranked as the most important intervention during wound care for postoperative CABG patients by 83.3% of respondents, according to the survey data. This is in line with clinical guidelines that emphasize infection prevention as the main objective of wound care. Reducing pain, encouraging the patient to mobilize early, and applying pressure to stop hemorrhage are essential aspects of postoperative care but are not deemed to be of prime importance on their own for wound care. The results reveal the necessity for proper protocols and constant education for sterile procedure adherence. To help patients achieve maximum results, they also address other concerns related to recovery.

According to the survey, 87% of the respondents said that redness, warmth, and swelling at the incision site are the most common signs of a surgical site infection after CABG surgery. These symptoms are widely acknowledged as the primary markers of a surgical site infection. Additional evidence of the fact that larger symptoms like redness and heat typically signify infection has been established through the less frequent selection of other possible signs, like clear drainage, mild tenderness, and normal body temperature. These results show the importance of close monitoring of a wound and how immediate intervention will prevent or treat surgical site infections with better recovery of patients after surgery, with 38.2% of respondents selecting both within immediate administration and within two hours after surgery, poll results reflect large support for prompt administration of prophylactic antibiotics in CABG patients. It means that present guidelines recommending antibiotic use as a preoperative therapy to reduce the infection rate are being applied. In line with the principle of proactive prevention of infection, instead of just waiting for it to occur, it does not support antibiotics within 24 hours of surgery or when symptoms of an infection begin.

The findings from these studies have indicated that there is a dire need for antibiotic treatment to occur immediately in preventing surgical site infections and ensuring maximum recovery for patients undergoing CABG surgery. The statistics show that 52.8% of the respondents employed an incentive spirometer, and this is the most effective treatment for preventing atelectasis among post-CABG patients. A total of 29.6% argued that coughing and deep breathing exercises should begin a day after surgery, whereas 31.5% believed that

the practice should be commenced 24 hours once extubated. These will follow clinical best practices in that respiratory exercises and early mobilization are expected to prevent atelectasis while preserving lung function so that postoperative CABG patients can recover to the best possible level and be protected from further respiratory complications by the initiation of these exercises on time. In addition, the outcome suggests that being proactive and starting at a young age would go ahead with being reactive, which results in waiting for the coming of breathing problems. The outturn of the survey shows that pulmonary embolism has emerged as the major respiratory complication causing anxiety among nurses during the postoperative CABG time, accounting for 40.7%, followed by pneumonia at 29.6%. These results underscore the need to prevent the occurrence of thromboembolic events and respiratory infections in the treatment of postoperative cases. Nurses should adopt preventive policies against pneumonia and be most attentive to the possibility of developing PE. Presurgical care should be individualized for patients with chronic respiratory conditions like bronchospasm or asthma.

Early intervention, education, and comprehensive teamwork are critical for maximal benefit in respiratory recuperation and the reduction of complications after surgery. From the survey, it can be observed that the most important reason for administering anticoagulants to postoperative CABG patients is to prevent graft occlusion. This conforms with the principles of modern clinical practice, where anticoagulants are primarily used in the prevention of blood clots in newly grafted arteries. Because a considerable number of respondents mistakenly identified the role of anticoagulants in infection prevention, the results highlight the need for further clearing up of misconceptions. The healing process safety and effectiveness of drug use by patients and healthcare personnel receive quality education. According to the data study, the most frequent cause of hypotension in CABG postoperative patients is major blood loss, 55.6%. Other leading causes are heart failure, 9.3%; sepsis, 11.1%; and insufficient fluid resuscitation, 24.1%. These results indicate that the management of hypotension requires a multimodal approach that emphasizes cautious blood loss control, hydration management, and early identification of sepsis or cardiac problems.

A comprehensive recovery and the avoidance of major difficulties during the postoperative phase depend on following the right procedures and keeping a close eye on things. The most important indicator for a nurse to monitor in the evaluation of graft patency in a postoperative CABG patient is aberrant ECG rhythms, as indicated by the survey results (55.6%). In accordance with clinical practice standards, alterations in ECG are considered to be important indicators of myocardial ischemia or graft failure. Although important indicators to monitor include heart rate, blood pressure, and pain, ECG changes are more specific to graft patency. Continuous ECG monitoring should, therefore, be placed at the top of the agenda in postoperative care to detect early signs of graft dysfunction and ensure timely intervention. Healthcare providers should, therefore, give priority to the psychological treatment of postoperative CABG patients, besides their physical treatment, to ensure the best possible recovery. This can lead to better recovery outcomes in both aspects since physical symptoms such as pain, heart rate fluctuation, and blood pressure changes can cause significant psychological impacts. It helps the patients in dealing with both physical and psychological problems and increases the patient's control over their rehabilitation process.

The best practice of healing is to give comfort to the patient and offer opportunities for the patient to voice their anxieties. This directly addresses the emotional needs of the patient, decreasing worry, promoting mental health, and promoting healing. Healthcare providers should listen to what the patient has to say, lend an ear to the emotions expressed, and reassure the patient about recovery for both psychological and physical recovery. A good patient education plan before discharge after CABG surgery is believed to be the most effective, based on the results. The issues of medication adherence, dietary changes, and quitting smoking enhance the chances of a full recovery but also make sure that the patient is well-prepared to manage their health in the future. By enabling the patient to take an active role in managing their cardiovascular health, such a comprehensive plan can enhance quality of life and minimize the risk of complications. Based on the results, most of the subjects concur that it is safest to start driving again three months after CABG surgery, consistent with medical convention. It is important to provide patients enough time to recuperate and to start driving again only once they have sufficiently recovered their physical and mental abilities.

The patient's readiness to drive safely again can often be confirmed by follow-up visits with the healthcare practitioner. It should be kept in mind that each patient heals uniquely, and driving privileges should always be based on individual progress and medical recommendations. The results indicate that the primary component of post-CABG surgical education for patients is the insistence on regular follow-up appointments with the cardiologist. These check-ups ensure that the patient's recuperation is followed, possible problems are identified before they occur, and lifestyle or prescription changes may be implemented according to the individual. The less broad selection of options, including restriction of fluids or abstinence from all activities for three months, indicates the subtle awareness that patient-specific advice and tailored treatment are crucial for recuperation. Patient outcomes can be further improved, and problems can be avoided by placing an emphasis on medication adherence and proper physical activity during education. The results show a clear understanding that the dietician is ultimately in charge of

providing nutritional support to postoperative CABG patients. Even though nurses, cardiologists, and physiotherapists each play an important role in taking care of patients, the most capable member of the team to provide patients with personalized diet advice to promote recovery and reduce complications after surgery is the dietician. The knowledge the dietitian possesses about nutrition is imperative in facilitating heart-healthy diets by improving a patient's cardiac health and helping them recover in general. Given that each team member has his or her speciality, the interdisciplinary approach ensures that the patient gets all-rounded care.

Most respondents (76.9%) correctly identified that assessment of patient status and good communication with the healthcare team are the primary roles of nurses in the multidisciplinary treatment of CABG patients. Because nurses are always monitoring the status, looking for problems, and ensuring that the rest of the healthcare team is informed and capable of making quick decisions, such a role is extremely important. Findings also underscore how teamwork is fundamental in-patient care. Other professionals like cardiologists and dietitians manage the diagnosis and treatment course, while nurses provide direct care and prescribing.

The nurses also act as a patient advocate and a care coordinator who ensure that every team member communicates with each other. The data indicates that most of the responders are confident about their ability to deliver high-quality care and successful recovery for CABG patients. However, there is a possibility of helping those who are uncertain or only moderately confident in certain areas of care. More training, resources, and mentorship can increase the general confidence and competency of healthcare teams to provide the best care possible for CABG patients. Professional confidence in patient care is not only very important, but it also directly correlates with patient happiness and results. The findings include a number of areas, such as respiratory management, cardiovascular monitoring, pain management, wound care, and psychosocial support. Crucially, a comprehensive, multidisciplinary education program that addresses these diverse areas may be sufficient to achieve an improved standard of care. A balanced curriculum would likely provide the greatest benefit, as 30.8% perceived that education was needed in all areas.

5. Conclusion

The results of this survey emphasize that postoperative care for CABG patients should be more focused on proper specialized training, the use of standardized protocols, and the interdisciplinary approach of healthcare professionals.

The statistics obtained indicate some critical knowledge and experience gaps, primarily in areas related to specialized postoperative training, complication management, and effective communication among healthcare providers. The skewed demographic and professional background of the sample also limits generalizability, pointing to the need for greater diversity of participants in future studies.

To ensure optimal care for CABG patients, education and training programs for healthcare professionals should be prioritized, especially in areas where knowledge gaps were identified. Comprehensive, evidence-based training and standardized care protocols will help healthcare teams improve patient outcomes, prevent complications, and enhance recovery. Multidisciplinary care where nurses, cardiologists, dietitians, and physiotherapists collaborate to ensure that patients receive whole care from body, mind, and spirit is provided.

Ultimately, addressing these gaps in training and practice will contribute to improved patient safety, better clinical outcomes, and a more effective healthcare system overall.

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