# Factors affecting Nurses ' performance regarding the care for patients underwent coronary artery bypass graft

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**Abstract**

***Background*:** Coronary artery bypass grafting is a common surgery to treat coronary artery disease. It involves a section of a vein or an artery to create a connection (or bypass) between the aorta and the coronary artery beyond the obstruction*. **Aim of the study* :** Was To assess factors affecting nurse's performance regarding the care for patients underwent coronary artery bypass graft in intensive care units at Zagazig University Hospital. ***Subjects and Method*: Research Design:** A descriptive exploratory design. **Setting:** The study was conducted in cardiothorathic Intensive Care Unit and intermediate intensive care unit At Zagazig University Hospitals. **Subject:** A convenient sample of 40 nurses. **Tools of Data Collection:** Two tools were used **Tool I**. A self-administered questionnaire composed of three parts: part 1: nurses' demographic data. Part 2: nurses' knowledge regarding the care for patient underwent CABG part 3: factor affecting nurses' performance regarding the care for patients underwent CABG. **Tool II**: Observational checklist to assess nurses' practice. ***Results***: revealed that 57.5% of studied nurses their age ranged from 20-40 years old and were females. 52.5 % of nurses 'graduated from diploma nursing, and 65.0%of nurses had years of experience in the ICU more than 10 years .The present study indicated that more than half of the studied nurses had unsatisfactory total knowledge and inadequate total practice regarding the care for patients underwent CABG.90% of nurses not affected by total factors related to nurse. While,10% of them affected by total factors related to patient. 62.5% of nurses not affected by total factors related to work. Also, this finding reveals that there was no significant relation between Nurses' Knowledge and Practice Scores and factors affecting nurse performance. There was none statistically significant association between total practice and knowledge among studied nurse. ***Conclusion:***the study finding concluded that nurses had unsatisfactory level of knowledge and inadequate practice regarding the care for patients underwent CABG. ***Recommendations***: Therefore this study recommended that the importance of implementing an educational training program to improve nurses 'performance regarding care for patient underwent CABG and recommended to develop a good nurse job description .

**Keywords**: Coronary artery bypass grafting, Nursing performance and factors affecting nursing performance

## Introduction:

Coronary disease is a group of diseases that include both the heart and blood vessels, including coronary heart disease (CHD), coronary artery disease (CAD), and acute coronary syndrome (ACS)[(1)].The incidence of CAD in elderly worldwide, 60-79 years old age group, reached 19.9% in men and 9.7% in women. 11.3% of men and 4.2% of women in this age group have had a myocardial infarction (MI). For the age >80 years old group, CAD reached 32.2% in men and 18.8% in women. 17.3% of men and 8.9 % of women in this age group have had MI[(2)].

Coronary heart disease deaths in Egypt reached 107, 232 or 23.14% of total deaths. The age-adjusted death rate is 186.36 per 100,000 of population, ranks Egypt 23 in the world [(3)].

Coronary artery disease is caused by a process called atherosclerosis in which fats such as cholesterol and other substances build up in the walls of the arteries that supply blood to the heart (called coronary arteries) and other parts of the body. Plaque buildup causes the intimate of the arteries to narrow over time, which could block the blood flow partially or totally, consequently heart muscle does not get enough blood that may result in chest pain or discomfort (called angina), the most common symptom of CAD. In addition, irregular heartbeat or arrhythmia can develop [(4)].

Major risk factors include high, low density lipoprotein (LDL) and low high density lipoprotein (HDL) cholesterol. Blood pressure is considered high if it stays at or above 140/90 mmHg over time. If there diabetes or chronic kidney disease, high

blood pressure is defined as 130/80 mmHg or higher. Smoking, Lack of physical activity and unhealthy diet can worsen other risk factors for CAD. Genetic or lifestyle factors cause plaque to build up in arteries with age. The risk increases if the father or a brother was diagnosed with CAD before 55 years of age, or if a mother or a sister was diagnosed with CAD before 65 years of age[5].

Although chest discomfort remains the most frequent presenting complaint of patients with CAD, the elderly have a higher percentage of atypical chest pain complaints as well as non-chest pain presentations (general fatigue/malaise, dyspnea, abdominal pain, nausea and vomiting, or syncope)[6].

The most common presentation of obstructive CAD is atypical symptoms, such as back pain, dyspnea, indigestion, nausea/vomiting and weakness, pain in the jaw and neck, and chest pain like feeling of fullness[7].

(CABG) is a heart operation. It uses blood vessels taken from another part of your body to go around or “bypass” blocked or narrowed coronary (heart) arteries. The surgery helps people whose coronary arteries have become narrowed or blocked by fatty material called plaque. The bypass allows more blood and oxygen to flow to the heart muscle[8].

It is estimated that 571,000 cardiac bypass surgeries are performed on 355,000 people annually in the USA. Of the people who undergo bypass surgery, 238,000 are men, 117,000 are women, and 27,000 are over 65 years of age[9].

Common complications associated with CABG surgery include renal failure, respiratory failure, perioperative myocardial infarction (MI), vein graft closure, hemorrhage, micro emboli, dysrhythmias, pericarditis, post pericardiotomy syndrome, embolism, pneumonia, atelectasis, hemothorax, stroke, and postcardiotomy delirium. Other complications that are seen less often include stress ulcer, endocarditis, gastrointestinal bleeding, mediastinitis, and paralytic ileus[10].

Postoperative care is the management of a patient after surgery. This includes the care given during the immediate postoperative period, both in the operating room and post anesthesia care unit (PACU), as well as days following the surgery. This aims to prevent complications such as infection, promote healing of the surgical incision, and to return the patient to a state of health, and decreasing length of hospitalization, and thus prevent nosocomial infection[11].

**Significance of the Study:**

In adequate compliance with recommended postoperative care after CABG remains an important problem that facing health care providers in all settings and populations. Based on previous researches, it was noted that non-compliance with postoperative care creates a threat to satisfactory outcome [12]. If the nurse is unable to maintain compliance with postoperative care, these will lead to complications to the patients; increasing their patient length of hospital stays, morbidity and mortality, raising the costs of treatment and effort of the care providers [13].

**Aim of the study:**

**The aim of this study was:**

To assess factors affecting nurse's performance regarding the care for patients underwent coronary artery bypass graft in intensive care units at zagzag university hospital. "?

**Research Questions:**

- What is the level of nurses' knowledge regarding the care for patients underwent coronary artery bypass graft**?**
- What is the level of nurses' practice regarding the care for patients underwent coronary artery bypass graft**?**
- What are factors affecting nurses' performance regarding the care for patients underwent coronary artery bypass graft**?**

**Subjects and methods:**

**Research design:**

A descriptive exploratory design was used.

**Study setting:**

This study was conducted in cardiothorathic Intensive Care Unit & intermediate intensive care unit at Zagazig University Hospitals.

**Study subjects:**

The study sample included a convenient sample of all available nurses (40)working in previously mentioned setting.

**Tools of data collection:**

Two tools were utilized for data collection:

**Tool I**: **Self-administered questionnaire:**

It was designed in Arabic form to avoid misunderstanding. It was designed by the researcher after reviewing of related literature and opinions of experts for content of validity and included the following three parts:

**Part 1: Demographic data of the nurses**: It was consisted of seven closed ended questions (1 to 7) as the following: nurses' age, gender, level of education, total years of experience, years of experience in ICU and training courses**.**

**Part 2: Nurses Knowledge:** This part was used to assess nurses' knowledge regarding the care for patients underwent coronary artery bypass graft. It composed of two parts include:

A. **Nurses' knowledge about assessments of coronary artery by bass graft:** It was composed of 6 main questions as multiple choice questions MCQ such as (Definition of coronary artery bypasses surgery, Indications for surgery, Common arteries used for grafting, immediate post-operative complications, Causes of bleeding after surgery, Duration of prophylactic antibiotic after surgery).
B. **Nurses' knowledge about postoperative care for patient on mechanical ventilation:** it was composed of 50 questions , as multiple choice questions MCQ, yes or no.it concerned with assessment of the following :
   - **Nurses' knowledge regarding to: the Care of patients with endotracheal tube**. It was composed of 5 questions (sign of exit of endotracheal tube, Care of patients with endotracheal tube and so on…).
   - **Nurses' knowledge regarding to: the care of airway:** It was composed of 4 questions (best methods for keeping patent airway, fixation of airway tube and so on…).
   - **Nurses knowledge regarding to: the Care of patients during suction.** It was composed of 8 questions (to avoid decreasing oxygen level , precaution before suction patient on ventilator and so on…).
   - **Nurses knowledge regarding to: nursing care of central venous catheter**: It was composed of 5questions (routine change of central venous catheter, advice to use ACVC and so on…).
   - **Nurses knowledge regarding to: the Care of patients mouth and airway:** It was composed of 2 questions (routine removal& clean of airway tube, to avoid ventilator associated pneumonia).
   - **Nurses' knowledge regarding to: nursing care during analysis of blood gases:** It was composed of 7 questions (evidence of efficient nursing care to patient with failure of gas exchange, nursing role to patient with failure of gas exchange and so on…).
   - **Nurses knowledge regarding to: nursing care toward moisture:** It was composed of 3 questions (benefits of using lubricants in ventilators, temperature of fluids putted in lubricant and moisturant filled with)
   - **Nurses' knowledge regarding to: nursing care toward respiratory exercise**: It was composed of 8 questions (best position of the patient, change position exercise and so on…).
   - **Nurses' knowledge regarding to: nursing care as regard diet and fluid:** It was composed of 4 questions (To prevent thickness of respiratory discharge, Importance of feeding to patient on ventilator and so on…).
   - **Nurses knowledge regarding to: nursing care toward infection control:** It was composed of 3 questions(time of changing tube of ventilator, time of sterilization of ambo bag and time of change saline used for cleaning tubes)
   - **Nurses' knowledge regarding to: the Care of patients with chest**

**tube:** It was composed of 7 questions (indication of using chest tube, usually insertion of chest tube under general anesthesia and so on…).

- **Nurses' knowledge regarding to: nursing care of urinary catheter:** It was composed of 10 questions (small catheter is preferred, urinary catheter used when necessary and removed when patient discharged and so on…).

**The scoring system for nurses' knowledge regarding the care for patients underwent coronary artery bypass graft:** For the knowledge items, a correct response was scored 1 and the incorrect zero. For each area of knowledge, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score. Knowledge was considered satisfactory if the percent score was 60% or more and unsatisfactory if less than 60%.

**Part 3: Factors affecting nurses 'performance regarding the care for patients underwent coronary artery bypass graft:** This part was used to asses factors that affecting nurses 'performance regarding care for patient underwent coronary artery bypass graft composed of four:

1. Nurses related factor.
2. Patients related factor.
3. Work related factor.

**A) Factors related to nurses**: were consisted of four items:

- **Physical factor**: it was consisted of 6 questions (low, moderate, high) concerned with: Assessment of general symptoms, acute diseases, chronic diseases, overweight, eye problems and hearing problems.
- **Psychological factors**: it was consisted of 8 questions (low, moderate, high) concerned with: Assessment of Sleeping problems, Fear feeling, Painful feeling toward patients, Depression, Anxiety, Feeling alone, Need to cry and Feeling of failure
- **Socioeconomic factors:** it was consisted of 6 questions (low, moderate, high) concerned with: Assessment of Far distance, Difficult transportation, Low economic, Family duties, Decrease familial support and Poor communication
- **Professional factor:** it was consisted of 5 questions (low, moderate, high) concerned with: Assessment of No job satisfaction, Felling of working incompetence, unclear job description, unclear roles & responsibilities and Unrespect to their job.

**B) Factors related to patient:** it was consisted of 10 questions (low, moderate, high) concerned with: Assessment of Age, Sex, Religion, Poor health status, Psychological state, Ability to Communicate, Movement state, Adherence to advice Communication with relatives of patients and Keeping privacy and confidence.

**c) Factors related to work:** was consisted of four items:

- **Relation with their nursing college:** it was consisted of 6 questions (low, moderate, high) concerned with: No cooperation, Decrease ability to work as a team, increase burden of work due to lack of experience, Increase burden of work due to increase absenteeism, Lack of social communication and Felling of lack of fairness.
- **Relation between health care providers:** it was consisted of 9 questions (low, moderate, high) concerned with :Doctors not used simple language ,Unclear advices, Unclear tasks and responsibilities., Lack of respect ,Lack of respect of doctor to nurses ,Difficulty in reaching doctor ,Unclear response to patient needs, Not completing patient record and Not coming at proper time
- **Factors related to work organization:** it was consisted of 4 questions (low, moderate, and high) concerned with**:** Burden of work**,** Work in shifts**,** Overtime hours **and** Lack of training
- **Factors related to work environment:** it was consisted of 17 questions (low, moderate, high) concerned with**:** Safety in work environment **,**Risks in work environment **,**Support from heads**,** phoning communication**,** equipment**,** Availability of antiseptic gel, personal protective equipment, infection control guidelines, health services to employees

,proper temperature inside units ,proper area of work units, proper lightening of work units, saving personal materials , place to remove clothes., clean bathroom, kinder ground and cafeteria.

**Scoring system for Factors affecting performance regarding the care for patients underwent coronary artery bypass graft :** Each statement was scored 0 for “low” , 1 for “moderate "and 2“high.” for The scores of statements of each group of factors and for the total scale were summed-up so that a higher score indicates factor affect . These scores were converted into percent scores. They were then categorized according to influence into “affected: 60%+,” and “Not affected : <60%.”

**Tool II: Observational Checklist (Appendix II)**

Was to assess nursing practices regarding care for patient underwent coronary artery bypass graft (CABG): It was consisted of two items as the following and the answer with done or not done.

a) **Check list about Primary assessment:-**It consists of twelve parts**:**
   **Part 1:** consisted of 4 items about assessment of vital signs.
   **Part 2:** consisted of 4 items about respiratory assessment
   **Part 3:** consisted of 3 items about cardiovascular assessment
   **Part 4:** consisted of 5 items about neurological assessment
   **Part 5:** consisted of 3 items about fluid/electrolyte assessment
   **Part 6:** consisted of 7 items about Circulation
   **Part 7:** consisted of 5 items about Digestive system
   **Part 8:** consisted of 5 items about Urinary system
   **Part 9:** consisted of 6 items about medication administered as ordered
   **Part 10:** consisted of 3 items about Patient position
   **Part 11**: consisted of 6 items about Wound assessment
   **Part 12:** consisted of 5 items about Pain assessment
b) **Check list about secondary assessment**: It consists of seven parts
   **Part 1**: consisted of 5 items about Maintain patent airway
   **Part 2:** consisted of 2 items about Care of endotracheal tube
   **Part 3**: consisted of 4 items about ABG
   **Part 4**: consisted of 4 items about Ventilator weaning and safe extubation
   **Part 5**: consisted of 4 items about measuring central venous pressure (CVP)
   **Part 6**: consisted of 4 items about Routine care for chest tube.
   **Part 7**: consisted of 4 items about Measuring Intake and Output.

**Scoring system for nurses' Practice:**

In the observation checklists, the items “not done” were scored zero. For each procedure, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. The practice was considered satisfactory if the percent score was 60% or more and unsatisfactory if less than 60% based on data collection.

**Content Validity and Reliability:**

It was established for assure of content validity by a panel of 7expertise's in medicine and medical surgical nursing at Zagazig University who revised the tools for clarity, relevance, comprehensiveness, understanding, and ease for implementations and according to their opinion minor modification were applied.

The reliability statistics of the nurses practice scale was tested through assessing its internal consistency. It demonstrated a very high level of reliability with (**cronbach's alpha 0.691)**.

**Field work:**

After obtaining the official permissions, the investigator started to recruit the sample of nurses. Each nurse was met individually, got a full explanation about the aim of the study and was invited to participate. The nurse who gave his/her verbal informed consent to participate was handed the self-administered questionnaire and was instructed during the filling.

Data collection took a period of six months from the beginning of October 2018 to end of March 2019. The data were collected two days a week (Saturday &

Thursday) from 8:30 am to 2:00 pm. The time used for finishing the self-administered questionnaire ranged between 15 - 30 minutes for each nurse according to nurse's physical and mental readiness and for nurses practice, indirect observation each nurse practice done before administer questionnaire took 30-45 minutes for each procedure.

**Pilot study:**

A pilot study for tools of data collection was carried out on 10% in order to test whether they are clear, understandable, and feasible and applicability. For this study, the researcher randomly selected 9 nurses to participate in the pilot testing of the questionnaire and checklist. Simple modification was done based on pilot results and the sample who shared in the pilot study excluded from the study sample.

**Administrative and ethical considerations**:

All ethical issues were taken into consideration during all phases of the study: The researcher maintained anonymity and confidentiality of the subject .The inclusion in the study was totally voluntary. The aim of the study was explained to every nurse before participation and an oral consent was obtained. nurses were notified that they can withdraw at any stage of the research: also they were assured that the information obtained during the study would be confidential and used for the research purpose only .An official permission were obtained by submission of formal letters issued from dean of the Faculty of Nursing, Zagazig University to the responsible authorities of the study setting to obtain their permission for data collection.

**Statistical Analysis:**

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Guttman split-half coefficient was calculated to assess the reliability of the tool through its internal consistency. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. In larger than 2x2 cross-tables, no test could be applied whenever the expected value in 10% or more of the cells was less than 5. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. In order to identify the independent predictors of knowledge, performance, factors, and practice scores, multiple linear regression analysis was used and analysis of variance for the full regression models was done. Statistical significance was considered at p-value <0.05.

**Results:**

**Table (1):** Represents the study sample consisted of 40 nurses; regarding their age 57.5% the more than half of nurses (57.5%) ranged between 20-40 years old and were 100% females. In addition the 95.0% were married. As regard nursing qualification more than half of nurses 52.5% were Diploma of nursing. Furthermore less than half of nurses 42.5% had total years of experience in the hospital more than 20 years with Mean±SD 16.2±8.3, but around two third of nurses 65.0% had more than 10 year of experience in the ICU with Mean±SD 12.1±7.4. Meanwhile three quarter of nurses 75.0% hadn't previously attended training about care of patients.87.5% hadn't enough income but 12.5%had enough income. While 82.5% their residence was in rural area and 17.5% their residence was in urban area.

**Table (2):** This table shows that the total satisfactory knowledge of nurse regarding coronary artery bypasses surgery was (5%). The highest satisfactory knowledge were related to duration of prophylactic antibiotic after surgery (95%) and Causes of bleeding after surgery (92.5%) while, the lowest was related to Immediate post-operative complications (17.5%)

**Table (3):** This table shows that the total satisfactory knowledge of nurse regarding nursing care regards respiratory exercise (22.5%). The highest satisfactory knowledge was related to main objective of respiratory exercise (92.5%). While, the lowest satisfactory knowledge was related to time of respiratory exercise was

(30.0%).also this table shows that the total satisfactory knowledge of nurse regarding nursing care about diet and fluids was (30.0%). The highest satisfactory knowledge was related to Measures used at insertion of Ryle (97.5%). While, the lowest satisfactory knowledge was related to prevent thickness of respiratory discharge (35.0%) and it shows that the total satisfactory knowledge of nurse regarding nursing care toward infection control (10.0%). The highest satisfactory knowledge was related to time of change saline used for cleaning tubes (97.5%).While,the lowest satisfactory knowledge was related to time of sterilization of ambo bag (20.0%).

**Table (4):** This table shows that the total satisfactory knowledge of nurse regarding postoperative care of patients with coronary artery bypass (7.5%). Also shows that satisfactory knowledge regarding Nurses knowledge about CABG operation was (5.0%). The highest satisfactory knowledge about nursing care after operation was related to nursing care toward moisture (67.5%). The lowest satisfactory knowledge about nursing care after operation was related to care of airway (10%) and nursing care toward infection control (10%).

**Table(5):** This table shows that 97% of nurses had satisfactory practice regarding primary assessment of Wound assessment (Urinary system), 92.5% of Patient position and Total satisfactory practice for Primary assessment (≥80%) was 17.5% .Also This table shows that 100% of nurses had satisfactory practice regarding Secondary assessment of ABG and Total satisfactory practice for Secondary assessment (≥80%) was 2.5%.

**Table (6):** This table shows that 90% of nurses' performance had moderate affecting by factors related to patient, 70% of them had moderate affecting by factors related to work. Also this table shows that 62.5% of nurses hadn't affecting by total factors affecting nurses' performance. While 37.5% of them had affecting by total factors affecting nurses' performance**.**

**Table (7):** This table shows that there were no statistically significant correlation between Nurses' Knowledge and Practice Scores and factors affecting nurse performance.

**Discussion:**

Coronary artery bypass grafting (CABG) has become an acceptable treatment for CAD. Compared with medical treatment, CABG surgery has proved effective in relieving angina and improving exercise tolerance, and it prolongs life in patients with left main CAD and three-vessel disease with poor left ventricular function **(14)**.

Cardiothoracic surgery nurse should be qualified enough to care for patients because those patients need special nursing care; standard nursing care to improve their conditions and to help in preventing or reducing potential postoperative complications. Nurses should develop their own standards of care and the profession should agree on acceptable levels of excellence. Nurses are planned, systematic and focused on mutually agreed goals in which standards of care influence nursing practice, education and management **(15)**.

The current study sample constitutes of 40 nurses that apply care for patient underwent CABG in the Intensive Care Unit at zagazig University Hospital. Regarding to the age of studied nurses the result of present study showed that majority of studied nurses their age between 20-40 years old and were females. More than two thirds of nurses were married. In addition more than half of the studied nurses were secondary school diploma and less than half of nurses had years of experience in hospital more than 20 years with mean 16.2±8.3, but more than half of the studied nurses had experience 10 years in ICU. A female's gender was higher than males due to the most of nurses in the past were females.

Regarding the study of nurses' characteristics, the results of the present study revealed that about more than half of the studied nurses 'ages were between 20 to 40 years. This might explain that they are female and tolerate the nature of the work. This finding is in agreement with El Feki**(16)**, who conducted a study about assessment of nurses' performance caring of surgical patients connected with oxygen therapy, and found that the more than half of his

study age group were above 30 years. Tanaka & Peniche[17], who conducted a study about perioperative care for morbid obese patients undergoing bariatric surgery, and found that, there was predominance of female nurses, 68 (97.1%) with mean age of 37.0 years (SD = 8.25 years), ranging from 31 to 40 years (37%).

Concerning educational level, the present study results indicated that, more than half of the studied nurses were secondary school diploma; this might elaborate current condition of nursing qualification in Egypt. This is consistent with Farag[18], who conducted a study about economic analysis of the nurse shortage in Egypt, and found that nursing education and the distribution on nurses approximately 87-93% diploma nursing school certificate.

Concerning to job, the present study results indicated that less than half of the studied nurses were technician nurses. This result disagree with Farag[18] who conducted a study about economic analysis of the nurse shortage in Egypt, and found that nursing education and the distribution on nurses approximately 87-93% were technician nurses with diploma nursing school certificate.

Regarding to studied nurses' gender, the present study revealed that all of the studied nurses were females. This is migh be due to the greater fraction of the nurses in Egypt were females and may also related to the studying of nursing in Egyptian university were exclusive for females only till few years ago. This finding is consistent with Zhu et al.[19] who conducted a study about nurses' selfefficacy and practices relating to weight management using surgical methods, and found that most of the nurses were females, confirming the majority of females in the profession.

Regarding years of experience, the current study showed that more than half of the studied nurses had experience 10 years in ICU and more because they had a certification and license to practice their field as a nurse since graduation. This finding goes in the same line with what was reported by Phillips et al.[20] who conducted a study about the challenge of obesity management for practice nurses in primary care after bariatric surgery and found that 61% of the studied nurses had 10-20 years of experience.

According to training courses about postoperative care, it was noted that more than three quarters of the studied sample hadn't attended training courses. This is in agreement with Tanaka & Peniche[17] who found that, the most of nurses didn't receive training courses and is contradicted with Ouspeh et al.[21], who conducted a study on the effectiveness of training and support on nurses' performance and nurses' resuscitation trainings at teaching hospital in KSA and found that the majority of the studied nurses received appropriate training courses about care of patients.

From the researchers point of view the training courses for nurses about postoperative care are very important to improve their performance, and will affect positively on quality of care for patients after surgery.

Concerning the results of the current study, it was found that, more than three quarters of the studied nurses had unsatisfactory knowledge regarding immediate postoperative care. This might be due to that the nurses didn't have enough information, training courses about it and absence of standard about nursing care related to immediate postoperative care. This finding goes in the same line with Marquis & Huston[22] who conducted a study about leadership roles and management functioning in nursing and found that that each medical organization and profession must set standards and objectives to guide team and practitioners in performing safe and effective care.

As regard nurse's knowledge, the current study showed that unsatisfactory level of nurse's knowledge about anatomy of heart, and care of patients underwent coronary artery bypass graft surgery, which reflects the lack in their scientific preparation.The findings indicate that a good improvement in the mean knowledge scores after implementation of nursing care standards. So, we can conclude from the data collected and analysis in the present study that all studied nurses weren't properly prepared prior to their working and/or dealing with such coronary artery bypass graft surgery patients and really they

got their experience while being there, working and managing the patients in the real life emergency situations. In this respect, Change[23]; mentioned that nurses must be able to expand their knowledge of this area through ongoing education, Journal, and seminars. Consequently, teaching programs for nursing staff constitute an important part. These programs are urgently designed to assess nursing staff in developing and enhancing the skills needed to provide high standards of care to their patients.

The conducted study; about less than half of the studied nurses had satisfactory level of knowledge regarding postoperative complications, this was in disagree with Lucas & Walker[24] who conducted a study about Total hip and total knee replacement: postoperative nursing management.

In the current study ,concerning to the results regarding to total knowledge of the studied nurses ,it was found that most of them had unsatisfactory level of knowledge about postoperative care of patient with coronary artery bypass. This may be due to that the nurses didn't have enough information, training courses about it and absence of standard about nursing care related to postoperative care. This finding goes in the same line with Marquis & Huston[22]. Also, leaders and managers must see that subordinates know and understand the standards and must be aware that their performance will be measured in terms of their ability to meet the established standards to provide quality of care.

The knowledge of nurses' regarding fluid chart was overall low by which less than half of the studied nurses, reported their knowledge as satisfactory. These findings should be considered to enhance the quality care in the Zagazig University Hospital. The present finding is similar to what reported by Aslam et al.[25], and his colleagues in their study to assess the knowledge and practice of the registered nurses about fluid and electrolytes monitoring and administration in the cardiac surgery patients where the nurses have poor knowledge regarding fluid and electrolytes administration in the postoperative care for cardiac patients.

The present study showed, less than half of the studied nurses had satisfactory knowledge regarding postoperative nutrition. This may be due to that nurses hadn't basic nursing instructions for patients after surgery. This result disagrees with Morris et al.[26] who conducted a study about nutrition knowledge, behaviors of postbariatric weight loss individuals, and found that more than half of the studied nurses in his study had satisfactory level of knowledge toward postoperative nutrition after bariatric surgery. British Journal of Nursing who mentioned that, as a part of the responsibilities in postoperative care; nurses need to be aware of risks of postoperative complications, and knowing the relevant anatomy and physiology surrounding the procedure. Also Walker [24] added that, this allows the nurses to understand the difficulties that patients go through, and the need for care after surgery.

The current study revealed a great improvement in the level of nurse's practice regarding care for patient underwent coronary artery bypass graft in all items. This has been concluded by the presence of significant differences between results of pre and post-operative care for patient underwent coronary artery bypass graft. This finding indicated that skills can be easily improved, especially if linked with their relevant scientific base of knowledge. In this respect, Sherwood[27]**;** reported an improvement in nurses' practice after the attendance at continuing nursing education sessions. Research findings indicated that continued nursing education programs increase both knowledge and performance and can also improve attitudes. As well, Abd-Ala[28]; documented that the in service training program has a beneficial effect in improving the nurses' knowledge and skills. They also recommended that educational programs should be organized according to the needs of nurses with continuous evaluation.

On factors militating against the nurses' performance regarding care for patient underwent coronary artery bypass graft; majority of the participants identified: Factors related to the patient more than three quarters, Psychological factors more than three quarters, Personal factors more

than two thirds and organizational factors more than half as the most common factors.(affected moderately).

Regarding environmental factors, this study is in an agreement with Chan[29] who conducted a study about occupational health, and mentioned that improvement of the work environment for nurses is important thus enhancing services delivery. Work place health promotion is a combined effort of employers, employees and society to improve the health and well-being of people at work. Concerning organizational factors in the form of (work load, the unavailability or shortage in supplies, managerial support, task autonomy and organizational laws); more than two thirds of the studied nurses reported that these factors had an effective effect on their performance.

The finding is consistent with what is indicated by Liebler & McConnell[30] who found that the burnout is caused by a combination of high workload and low coping resources. Letvak & Buck[31] conducted a study about factors influencing work productivity and intent to stay in nursing and also added that an increase in the workload resulted in increased absenteeism and a decrease in quality of care, and also confirm that staff shortages and shortage in supplies are constraints for delivering health care services In our study; psychological factors were rated as working against the nurses' performance regarding care for patients underwent coronary artery bypass graft by more than three quarters of the studied nurses highly affected . Limited work in this area had been done, so far, and only few studies had been published. Regarding personal factors, more than three quarters reported that they have job unsatisfaction regarding personal factors which affected their performance. This is in an agreement with Ehlers & Oosthuizen[32] who conducted a study on a sample of 108 nurses within south Africa , which revealed that personal factors such as monthly salary that nurses most prefer is a high level of base payment, followed closely by a quality work environment From the investigator point of view; inadequate salary in Egypt make nurses migrate to another countries leading to nurses' shortage and that lead to increase nurses' errors. The nurses reported that they are overloaded by work and Lim et al.[34] who conducted a study about Stress and coping in Australian nurses, and found that nurses commonly experience several stressors, including heavy workloads, conflicts between colleagues, working with inadequately prepared or inexperienced staff, aggressive patients and relatives, role ambiguity and shift work.

Concerning factors related to the patient, the present study showed that more than four fifth of the studied nurses reported that these factors had an effective effect on their performance. Limited work in this area had been done, so far, and only few studies had been published.

**Conclusion:**

**Based on the results of the present study; the study can be concluded that:**

The half of nurses in intended ICU graduated from school of nursing, their age ranged from 20- 40 years and slight more than three quarter of them had years of experience in the ICU more than 10 year, In relation to the almost of the nurses had unsatisfactory total knowledge and the almost of nurses had unsatisfactory total practice in relation to the factor affecting nurses performance , In addition to more than two third of nurses not affected by total factor related to work, while more than one third of nurses affected by total factor related to work, Additionally there was no statistical significant relation between knowledge and practice ,demographic data and factors affecting performance

**Recommendations:**

Based on the findings of the present study the following recommendations were suggested:

- Implementing an educational program for nurses to improve their performance regarding care for patients underwent coronary artery bypass graft.
- Developing a simplified and comprehensive booklet including guidelines about nursing care for patients underwent CABG.
- Close supervision and teaching on spot is needed to ensure that quality of care

is is provided by nurses while caring patients underwent CABG.

- Founding factors affecting nurses' performance while caring patients underwent CABG this lead to improving performance level.
- Further study is recommended to evaluate the reflection of educational training program regarding care for patients underwent CABG on nurses' performance and consequently on the patients outcome.

**Table 1:** Demographic Characteristics of Nurses in the Study Sample (n=40).

| Demographic Characteristics | Frequency | Percent (%) |
|---|---|---|
| **Age:** | | |
| <40 | 23 | 57.5 |
| ≥ 40 | 17 | 42.5 |
| Range | 22-50 | |
| Mean±SD | 35.9±8.5 | |
| **Gender** | | |
| Male | 0 | 0.0 |
| Female | 40 | 100.0 |
| **Nursing qualification:** | | |
| Diploma | 21 | 52.5 |
| Technician diploma | 9 | 22.0 |
| Bachelor | 10 | 25.0 |
| **Experience years (total):** | | |
| <20 | 23 | 57.5 |
| ≥ 20 | 17 | 42.5 |
| Range | 2-32 | |
| Mean±SD | 16.2±8.3 | |
| Median | 17 | |
| **Experience years (ICU):** | | |
| <10 | 14 | 35.0 |
| ≥10 | 26 | 65.0 |
| Range | 1-30 | |
| Mean±SD | 12.1±7.4 | |
| Median | 11.5 | |
| **Attended training about care of patients:** | | |
| No | 30 | 75.0 |
| Yes | 10 | 25.0 |
| **Marital status:** | | |
| Single | 2 | 5.0 |
| Married | 38 | 95.0 |
| **Income** | | |
| Not enough | 35 | 87.5 |
| Enough | 5 | 12.5 |
| **Residence** | | |
| Rural | 33 | 82.5 |
| Urban | 7 | 17.5 |

**Table 2:** Distribution of satisfactory knowledge about coronary artery bypass surgery among Nurses in the Study Sample (n=40).

| | Satisfactory knowledge | |
|---|---|---|
| | **No.** | **%** |
| A**- Nurses knowledge about coronary artery bypass surgery:** Definition of coronary artery bypasses surgery. | 30 | 75.0 |
| Indications for surgery | 12 | 30.0 |
| Common arteries used for grafting. | 9 | 22.5 |
| Immediate post-operative complications. | 7 | 17.5 |
| Causes of bleeding after surgery. | 37 | 92.5 |
| Duration of prophylactic antibiotic after surgery | 38 | 95.0 |
| **Total satisfactory knowledge (≥80%)** | 2 | 5.0 |

**Table 3:** Distribution of satisfactory knowledge about nursing care as regard respiratory exercise, diet & fluid and infection control after operation among Nurses in the Study Sample (n=40).

| Nurses knowledge about nursing care after operation | Satisfactory knowledge | |
|---|---|---|
| | No. | % |
| **H- Nursing care toward respiratory exercise:** | | |
| Best position of the patient | 31 | 77.5 |
| Change position exercise. | 22 | 55.0 |
| Measures used to facilitate removal of respiratory discharge | 26 | 65.0 |
| Main objective of respiratory exercise. | 37 | 92.5 |
| Position of patient with dyspnea. | 36 | 90.0 |
| Time of respiratory exercise. | 12 | 30.0 |
| Benefits of physiotherapy to chest | 31 | 77.5 |
| Time of specific position of the patient | 19 | 47.5 |
| **Total satisfactory knowledge (≥80%)** | 9 | 22.5 |
| **I- Nursing care as regard diet and fluids:** | | |
| To prevent thickness of respiratory discharge. | 14 | 35.0 |
| Importance of feeding to patient on ventilator. | 33 | 82.5 |
| Measures used at insertion of Ryle . | 39 | 97.5 |
| Disadvantage of improper feeding of patients on ventilator. | 28 | 70.0 |
| **Total satisfactory knowledge (≥80%)** | 12 | 30.0 |
| **J- Nursing care toward infection control:** | 29 | 72.5 |
| Time of changing tube of ventilator | | |
| Time of sterilization of ambo bag | 8 | 20.0 |
| Time of change saline used for cleaning tubes | 39 | 97.5 |
| **Total satisfactory knowledge (≥80%)** | 4 | 10.0 |

**Table 4:**Distribution of total satisfactory knowledge about post-operative care of patients with coronary artery bypass.

| Nurse knowledge about post-operative care | Satisfactory knowledge | |
|---|---|---|
| | No. | % |
| **A-Nurses knowledge about CABG operation** | 2 | 5.0 |
| **B-Nurses knowledge about nursing care after operation:** | 6 | 15.0 |
| Care of patients with endotracheal tube | | |
| Care of airway | 4 | 10.0 |
| Care of patients during suction | 17 | 42.5 |
| Nursing care of central venous catheter | 16 | 40.0 |
| Care of patients mouth and airway | 10 | 25 |
| Nursing care during analysis of blood gases | 14 | 35.0 |
| Nursing care toward moisture | 27 | 67.5 |
| Nursing care toward respiratory exercise | 9 | 22.5 |
| Nursing care as regard diet and fluids | 12 | 30.0 |
| Nursing care toward infection control | 4 | 10.0 |
| Care of patients with chest tube | 7 | 17.5 |
| Nurses knowledge about nursing care of urinary catheter | 13 | 32.5 |
| **Total satisfactory knowledge≥80** | 3 | 7.5 |

**Table 5:** Distribution of nurses' satisfactory practice about post-operative care of patients with coronary artery bypass.

| Nurse practice about post-operative care | Satisfactory practice | |
|---|---|---|
| | No. | % |
| **A - Primary assessment:** | | |
| Vital signs | 10 | 16.1 |
| Respiratory assessment | 4 | 10.0 |
| Cardiovascular assessment | 9 | 22.5 |
| Neurological assessment | 14 | 35.0 |
| Fluid/electrolyte assessment | 7 | 17.5 |
| Circulation | 10 | 25.0 |
| Digestive system | 5 | 12.5 |
| Urinary system | 39 | 97.5 |
| Medication administered as ordered | 34 | 85.0 |
| Patient position | 37 | 92.5 |
| Wound assessment | 8 | 20.0 |
| Pain assessment | 3 | 7.5 |
| **Total Primary assessment** | 7 | 17.5 |
| **B-Secondary assessment** | | |
| Maintain patent airway | 3 | 7.5 |
| Care of endotracheal tube | 0 | 0.0 |
| ABG | 0 | 100.0 |
| Ventilator weaning and safe extubation | 0 | 0.0 |
| Measuring central venous pressure (CVP) | 17 | 42.5 |
| Routine care for chest tube | 7 | 17.5 |
| Measuring Intake and Output | 5 | 12.5 |
| **Total secondary assessment** | 5 | 12.5 |
| **Total Satisfactory practice≥80%** | 1 | 2.5 |

**Table 6:** Distribution of factors affecting nurse performance regarding the care for patients with coronary bypass (n=40).

| Factors affecting nurse performance | Low | | Moderate | | High | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| **1- Factors related to nurse:** | | | | | | |
| Physical health | 0 | 0.0 | 12 | 30.0 | 28 | 70.0 |
| Psychological health | 1 | 2.5 | 12 | 30.0 | 27 | 67.5 |
| Socioeconomic factors | 0 | 0.0 | 28 | 70.0 | 12 | 30.0 |
| Professional factor | 2 | 5.0 | 26 | 65.0 | 12 | 30.0 |
| Total factors related to nurse | 0 | 0.0 | 13 | 32.5 | 27 | 67.5 |
| **2- Factors related to patients** | 0 | 0.0 | 36 | 90.0 | 4 | 10.0 |
| **3- Factors related to work:-** | | | | | | |
| Relation with their nursing college | 1 | 2.5 | 18 | 45.0 | 21 | 52.5 |
| Relation between health care providers | 0 | 0.0 | 10 | 25.0 | 30 | 75.0 |
| Factors related to work organization | 4 | 10.0 | 33 | 82.5 | 3 | 7.5 |
| Factors related to work environment | 0 | 0.0 | 30 | 75.0 | 10 | 25.0 |
| Total factors related to work | 0 | 0.0 | 28 | 70.0 | 12 | 30.0 |
| **Total factors affecting nurse performance** | | | | | | |
| **Affecting** | | 15 | | 37.5% | | |
| **Not affecting** | | 25 | | 62.5% | | |

**Table 7:** Correlation Alpha between Nurses' Knowledge and Practice Scores and factors affecting nurse performance.

| Factors | | Pearson's correlation coefficient | | | |
|---|---|---|---|---|---|
| | | Knowledge | | Practice | |
| | | R | p.value | R | p.value |
| **Practice** | | 0.17 | 0.294 | | |
| **factors affecting nurse performance** | **Nurse** | 0.004 | 0.982 | -0.013 | 0.938 |
| | **Patient** | 0.177 | 0.273 | -0.098 | 0.548 |
| | **Work** | -0.066 | 0.687 | -0.005 | 0.975 |
| | **Total** | -0.007 | 0.964 | -0.03 | 0.855 |

**Cronbach's Alpha for knowledge & factors affecting nurse performance =0.649**
**Cronbach's Alpha for practice tools=0.843**
**Cronbach's Alpha for all tools=0.691**

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