

Nurses' Role Regarding Care of Patients Undergoing Cardiac Catheterization

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Abstract:

Background: Nurses in the Cardiac Catheterization Laboratory (CCL) play an important role in providing patients care for patients prior to, during, and after any procedure. **Aim of the study:** Was to evaluate nurses' role regarding care of patients undergoing cardiac catheterization. **Subjects and Methods; Research design:** A descriptive design was used. **Setting:** This study was conducted at El Zagazig university hospital, cardiothorathic hospital and Elahrar hospital, Egypt. **Subjects:** A convenient sample of all available nurses working in the mentioned setting and their total number was (50) nurse. **Tools of data collection:** Two tools were used; a structured interview questionnaire and an observational checklist for nurses. **Results:** The study revealed that more than two third of studied nurse had unsatisfactory total knowledge regarding care of cardiac catheterization. More than half of studied nurse had satisfactory practice level regarding care of cardiac catheterization. Regarding patient's safety, the majority (88.0%) of the studied nurses had adequate level of practice. **Conclusion:** There was highly statistically significant positive correlation between total nurses' knowledge and their practices regarding care of patient undergoing cardiac catheterization at ($p = 0.000$). **Recommendations:** Develop an educational program for nurses in cardiac catheterization unit to provide the adequate performance needed to deal with such group of patients.

Key words: Nurses Role, Care, Cardiac Catheterization.

Introduction:

Nurses typically provide care for patients prior to, during, and after any procedure, such as cardiac catheterization, and have various roles and functions related to such patients' care. A nurse has a specialized role in which she works as a team member with other surgical health care professionals. As a result, the absence or limitation of good pre-operative teaching and preparation will increase the need for more surgical support to manage underlying medical conditions that are expected to occur ⁽¹⁾.

Nurses in the Cardiac Catheterization Laboratory (CCL) play an important role in providing patients with high-quality care. The key to becoming an effective and efficient nurse is through knowledge and current evidence-based practice. When possible, cardiac catheterization staff and nurses who care for post-cardiac catheterization procedure patients should collaborate to reduce complications and treat it when they occur. To achieve these objectives, nurses must assess and monitor patients carefully.

Nurses who have received specialized cardiac training must assess, identify, and manage blood vessels ⁽²⁾.

Competent nurses who care for patients during cardiac catheterization are able to reduce mortality and morbidity rates for these patients who undergo this procedure in a cardiac catheterization unit. Because of the nature of their work, which includes ongoing patient monitoring and care coordination, nurses play an important role in ensuring patient safety and manage complications ^(3 & 4).

The importance of immediate safety in minimizing complications in coronary care unit practice is becoming increasingly recognized. Individuals have the right to safe and effective quality health care, which is defined as being free from accidental harm as a result of a health care encounter removing femoral sheaths and managing related complications after procedure, such as promoting hemostasis as an essential issue,

are primarily the responsibilities of nurses in many acute and critical care settings ⁽⁵⁾.

Significance of the study:

Cardiac catheterization is one of the most widely performed cardiac procedures. According to the latest WHO data published in 2018 Coronary Heart Disease Deaths in Egypt reached 163,171 or 29.38% of total deaths ^(6 & 7).

On the other side, about 3600 patients with cardiac catheterizations are scheduled in 2020 at El zagazig university hospital for catheterization, from this point cardiac catheterization is an extremely valuable procedure in diagnosis and treatment of cardiac diseases according to that nursing care for patients undergoing cardiac catheterization necessitates the use of an expert nurse who has sufficient knowledge and skills for caring of those patients in an attempt to find out the gaps in nursing knowledge and practices in order to improve the nursing performance and enhance the patient's outcomes.

Aim of the study:

The aim of the study was to evaluate nurses' role regarding care of patient undergoing cardiac catheterization patients

Research Question:

- What is the level of nurse's knowledge regarding care of patient undergoing Cardiac catheterization?
- What is the level of nurse's practices regarding care of patient undergoing cardiac catheterization?

Subjects and Methods:

Research design:

Descriptive research "is a method that used to describe the existing phenomena as accurately as possible". The phenomena observed in descriptive research are already available the necessary thing for a researcher to do is collecting the available data through the use of research instruments such as test, questionnaire, interview, or even observation. The main goal of descriptive research is to describe systematically the existing phenomena under the study ⁽⁸⁾.

Study Setting:

The present study was conducted in cardiac catheterization department at Zagazig university hospitals, which located in the first floor and consists of cardiac catheterization lab beside cardiac intensive care unit and another cardiac catheterization lab at fourth floor at the other hospital belongs to the Zagazig university hospitals at cardio thoracic hospital and the ICU besides it and ELahrar hospital cardiac catheterization lab.

Study Subjects:

A convenience sample of all available nurses (50) working in the previous mentioned setting.

Tools of data collection:

Tool 1: A Structured Interview questionnaire composed of two parts:

- **Part I:** Demographic data for nurses: Which were composed of seven closed ended questions including age, sex, marital status, level of education, years of experience, work place, attended training courses, and income.
- **Part II:** Assessment questionnaire which was adapted from **Fadul** ⁽⁹⁾ to assess nurse's knowledge regarding care of patient undergoing cardiac catheterization which composed of 25 questions of multiple choice questions about (cardiac catheterization, preoperative care, Immediate care after cardiac catheterization and after cardiac catheterization).

Scoring system for nurses' knowledge:

For each knowledge items, a correct response was scored 1 and the incorrect response was scored zero. For each area of knowledge in question: (1, 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24), there is more than one answer in some questions as questions number (2, 3, 5, 6, 7, 8, 9, 22, 25). 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. Knowledge was considered:

- Satisfactory if the percent score was 70% or more
- Unsatisfactory if less than 70% based on statistical analysis. This high cutoff point was set because of the critical nature of the work of these nurses

Tool II: Section A: An Observational Checklist. This was developed by the researcher and adapted from **Fadul** ⁽⁹⁾ to assess nurse's practice regarding patient care. It consisted of (31) point covering three parts: Pre, during and post cardiac catheterization.

- **Part 1: Pre cardiac catheterization:** consisted of 14 point.
- **Part 2: During cardiac catheterization** consisted of 9 points.
- **Part 3: Post cardiac catheterization** consisted of 8 points.

Section B: An Observational Checklist to assess nurses' practice regarding patient safety intraoperative role regarding patient safety and health hazards during the three phases of surgery.

- **Phase I:** Sign-in (Before induction of anesthesia).
- **Phase II:** Time-out (period from anesthesia induction until before skin incision).
- **Phase III:** Sign-out: It was guided by **Alaa-Eldeen et al.** ⁽¹⁰⁾ and **Hebeshy et al.** ⁽¹¹⁾. This includes all the practices done at the end of the surgical operation.

Scoring system:

The items observed to be done correctly were scored "1" and the items not done correctly were scored "0". For each part, 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:

- Adequate if the percent score was 70% or more.
- Inadequate if less than 70% based on statistical analysis. This high cutoff

point was set because of the critical nature of the work of these nurses

Content Validity and Reliability:

Testing validity and reliability of the proposed tools by a jury of five experts, one of them professor and two assistant professors and two of them lecturers of medical surgical nursing at faculty of nursing, Zagazig university who reviewed the tool's content for clarity, relevance, comprehensiveness, understanding, and ease for implementation. All recommended modifications were done. Reviews which were done by five experts supported the content validity of data collection tools. Cronbach's Alpha that used to measure the internal consistency (reliability of used tool) was 0.817 for knowledge, for nurses' practice regarding patient care was 0.81 and for nurses practice regarding patient safety was 0.869, while Cronbach's Alpha for patient's satisfaction was 0.825.

Field work:

This study was executed in six months from January 2022 to June 2022. During this stage all the data were collected from the study subjects. The first phase of the work is the preparatory phase that done by meeting with head units after obtaining the official permissions to clarify the objective of the study and applied methodology.

The second phase that done by meeting the study subjects, 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 interviewing questionnaire and was instructed during the filling.

- Each nurse observed for two shifts (morning and afternoon shift) then asked to fulfill the questionnaire.
- The researcher was available two days at Zagazig university hospitals. As the researcher was observing nurses' practical skills about studied procedure. The time needed to complete the checklist varies between 30-45 minutes. The time needed to complete the checklist depended upon the time of the procedure and filled by the researcher

during nurses' performance inside the department.

- P-value < 0.01 Highly Significant (HS).

Pilot study:

Pilot study for tools of data collection was carried out in order to check and ensure the clarity, applicability, relevance and feasibility of the tools. For this study, the researcher selected five (10%) nurses random to participate in the pilot testing of the questionnaire and checklist and not excluded from the study sample because of no modifications in the tool.

Administrative and Ethical considerations:

An official permission for data collection in Zagazig University was obtained from the hospital administrative personnel by the submission of formal letter from the dean of the faculty of nursing, Zagazig University explaining the aim of the study in order to obtain permission and help. At the interview, each subject was informed about the purpose, benefits of the study, and they were informed that their participation is voluntary and they have right to withdraw from the study at any time without given any reason. In addition, confidentiality, and anonymity of the subjects were assured through coding of all data. The researcher assured that the data collected will be confidential and would be used only to improve their knowledge and practice for the purpose of the study

Ethical code: M.D.Zu.Nu.R/138/11 /4/2021

Statistical analysis:

Analysis of data was done by using the computer software of Microsoft Excel Program and Statistical Package for Social Science (SPSS) version 25. Data were presented using descriptive statistics in the form of frequencies and percentage for categorical data, the arithmetic mean (X) and standard deviation (SD) for quantitative data. Qualitative variables were compared using chi square test (X²). In addition, R- test were used to identify the correlation between the study variables. Reliability of the study tools was done using Cronbach's Alpha.

Degrees of significance of results were considered as follows:

- P-value > 0.05 Not significant (NS).
- P-value < 0.05 Significant (S).

Results:

Table (1): Shows that, two-fifth (40.0%) of the studied nurses their age ranged between 20-< 30 years, the Mean \pm SD of age was 34.72 ± 9.11 years. Regarding gender and marital status, the highest percentages (80.0% & 76.0%, respectively) of studied nurses were female and married. Also, more than two thirds (68.0%) of studied nurses had ≥ 10 years of nursing experience. As regard to workplace, the majority (80.0%) of studied nurses working at El zagazig university hospital. In addition, less than three quarters (70.0%) of the studied nurses attended training courses as, more than three quarters (77.1%) of studied nurses attended a basic life support course.

Table (2): Shows that, more than two thirds (68.0%) of the studied nurses had unsatisfactory level of total knowledge regarding care of cardiac catheterization.

Table (3): Shows that, more than half (56.0%) of the studied nurses had unsatisfactory practices regarding care of cardiac catheterization.

Table (4): It was evident that, the majority (88.0%) of the studied nurses had adequate practice regarding patients' safety towards patients undergoing cardiac catheterization.

Table (5): Reveals that, there was highly statistically significant positive correlation between total nurses' knowledge and their practice regarding care of patient undergoing cardiac catheterization at ($p = 0.000$).). In relation to total nurses practice regarding total patients' safety there was no significant correlation with nurses' total knowledge and practice score.

Discussion:

Regarding demographic characteristics, results of the present study revealed that, two-fifth of the studied nurses their age ranged between 20-< 30 years. As regards to gender, the current study results revealed that the majority of the study sample was females. As regards to marital status, the current study revealed that over three quarters of the studied nurses were married.

As regards level of education, the present study revealed that three-quarters of the studied nurses had nursing diploma. Concerning the years of experience, the current study showed that more than two thirds of the studied nurses had more than 10 years of experience in nursing.

According to nurses' knowledge the current study showed that, more than two thirds of the studied nurses had unsatisfactory level of knowledge regarding care of cardiac catheterization. According to researcher's point of view these findings reflected the lack of in-service educational programs related to cardiac catheterization care.

This finding was in harmony with **Jabr et al.** ⁽¹⁾ in a research paper titled "Vascular Complications and Risk factors regarding Patient Undergoing Cardiac Catheterization". The study clarified that more than three quarter of the studied nurses had unsatisfactory total level of knowledge regarding cardiac catheterization, more over **Khaliel et al.** ⁽⁴⁾ in a study titled with "Evaluate Nurses' Performance regarding Safety Measures in Cardiac Catheterization Unit at Benha University Hospital and Suggested Guidelines" revealed that more than half of the studied nurses had unsatisfactory level of total knowledge. This finding was in harmony with **Hassan** ⁽¹²⁾ and **Abd Elawhabe** ⁽¹³⁾ who mentioned in the study "Factors Affecting of Nurses Performance for Patients undergoing Cardiac Catheterization" that three fifth of the studied nurses had unsatisfactory level of the total knowledge.

According to Nurses' Practices Regarding Care of Cardiac Catheterization.

The current study presented that more than half of the studied nurses had inadequate practice regarding care of cardiac catheterization. This defect in nurses' practice might be due to lack of refreshment of knowledge and nurses concept of self-learning due to their increased duties in life which minimize their ability to read or update their information.

This study result agreed with **Mohammed et al.** ⁽¹⁴⁾ who reported in thesis entitled "Impact of Designed Nursing Educational protocol on Health Promotion for patients undergoing Coronary Artery Stent

Outcome" that the studied nurses had unsatisfactory level of practice about caring of patient undergoing cardiac catheterization.

In contrary with **Jabr et al.** ⁽¹⁾ in the study titled "Vascular Complications and Risk factors regarding Patient Undergoing Cardiac Catheterization" and **Abo El-ata** ⁽¹⁵⁾ who found that three quarters, and more than two thirds respectively of studied nurses had total satisfactory level of practice regarding cardiac catheterization.

According to total nurses' practice regarding patient's safety during cardiac catheterization

The majority of the studied nurses had high level of practice concerning patient's safety before induction of anesthesia, skin incision and post procedure. According to the researcher's point of view this finding was due to increased level of nurses' awareness about the importance of the practice and its importance regarding patient safety in operating room. The results were not in harmony with **Abd Elglil et al.** ⁽¹⁶⁾ in a paper titled "Nurses' Performance Regarding Patient Safety in Operating Room at Zagazig University Hospitals" and **Khaliel et al.** ⁽⁴⁾ showed that nearly two thirds of total studied nurses had an unsatisfactory level of practice.

Correlation between the studied nurses' knowledge, practices, patients' safety regarding care of cardiac catheterization.

The present study revealed that, there was highly statistically significant positive correlation between total nurses' knowledge and practices regarding care of cardiac catheterization at ($p = 0.000$). In relation to total nurses practice regarding total patients' safety there was no significant correlation with nurses total knowledge and practice score at ($p = >0.05$). These findings were in agreement with **Jabr et al.** ⁽¹⁾ revealed that there was a statistical significant positive correlation between knowledge score and practice score. This result was in the same line with **Feroze et al.** ⁽²⁾ who found a positive correlation between the skills and knowledge regarding patient's safety following cardiac catheterization in Pakistanis.

Conclusion:

Based on the results of the present study, it can be concluded that, more than two thirds of the studied nurses had unsatisfactory level of knowledge regarding care of patients undergoing cardiac catheterization more than half of the studied nurses had unsatisfactory level of practices regarding care of cardiac catheterization. The majority of the studied nurses had adequate level of practice concerning patient's safety.

Recommendations:

1. Develop an educational program for cardiac catheterization unit nurses to provide the adequate knowledge needed to deal with such group of patients.
2. It is strongly recommended that specific training courses related to care of cardiac catheterization be performed to enhance the level of practice.
3. Reapply this research on a larger probability sample acquired from different geographical areas in Egypt for generalization.

Table 1: Frequency and percentage distribution of the studied nurses according to demographic characteristics (n=50)

Demographic characteristics	No.	%
Age (Years)		
20-< 30	20	40.0
30-<40	13	26.0
40-<50	15	30.0
≥ 50	2	4.0
Mean ± SD	34.72 ± 9.11	
Min and Max	22-58	
Range	36	
Gender		
Male	10	20.0
Female	40	80.0
Marital status		
Married	38	76.0
Not married	12	24.0
Duration of Experience		
1-<5	8	16.0
5-<10	8	16.0
≥ 10	34	68.0
Mean ± SD	14.16 ± 9.22	
Min and max	1-39	
Range	38	
Work place		
El zagazig university hospitals	43	86.0
El Ahrar hospital	7	14.0
Attending training courses		
Yes	35	70.0
No	15	30.0
Training courses about (n=35)*		
Infection control	24	68.6
Basic life support	27	77.1
Quality	1	2.9

(* select more answer

Table 2: Frequency distribution of the studied nurses according to total knowledge subscales regarding care of cardiac catheterization (N=50)

Total Items Of Knowledge	Satisfactory ≥70		Unsatisfactory <70		Mean ± SD
	No.	%	No.	%	
Knowledge during preoperative phase	12	24.0	38	76.0	4.90 ± 2.23
Knowledge during intraoperative phase	20	40.0	30	60.0	1.94 ± 1.20
Knowledge during postoperative phase	18	36.0	32	64.0	5.80 ± 1.70
Total Knowledge	16	32.0	34	68.0	12.64 ± 4.32

Table 3: Frequency Distribution of the Studied Nurses According to Practice Subscales Regarding Care of patients undergoing Cardiac Catheterization (N=50)

Total Practice Items	Satisfactory ≥70%		Un Satisfactory <70%		Mean ± SD
	No.	%	No.	%	
Nurse's role before cardiac catheterization	17	34.0	33	66.0	9.20 ± 1.56
Nurse's role during cardiac catheterization	48	96.0	2	4.0	8.68 ± 0.74
Nurse's role after cardiac catheterization	20	40.0	30	60.0	4.96 ± 1.60
Total Practice	22	44.0	28	56.0	22.84 ± 2.72

Table 4: Frequency distribution of the studied nurses according to total practice regarding patients' safety during cardiac catheterization (N=50)

Total Practice Regarding Patients' Safety	Adequate		In Adequate		Mean ± SD
	No.	%	No.	%	
Before induction of anesthesia	44	88.0	6	12	46.50 ± 2.59
Take a break (Before skin incision)	42	84.0	8	16.0	5.94 ± 1.91
Post procedure	40	80.0	10	20.0	18.64 ± 2.67
Total safety score	44	88.0	6	12	71.08 ± 6.92

Table 5: Correlation between the studied nurses' knowledge, practices total patients' satisfaction score and safety score regarding care of cardiac catheterization (n=50)

Variables	Total Nurses' Practice Score		Total nurses's Practice Regarding Patients' Safety score	
	R	p-value	R	p-value
Total nurses' knowledge score	0.501	0.000**	0.096	0.103
Total nurses' practice score			0.108	0.095

r= correlation coefficient test.

** Highly significant correlation at p < 0.01.

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