

## Factors Affecting of Nurses Performance for Patients undergoing Cardiac Catheterization

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### Abstract

**Background:** Cardiac catheterization is a special study of the heart and the blood vessels that supply blood to the heart muscle. **Aim of the study:** the aim of this study was to assess nurses' performance for patients undergoing cardiac catheterization. **Design:** A descriptive exploratory design was utilized. **Setting:** The study was carried out in critical care unit at Beni Suef University Hospital. **Study subjects:** convenience sample of all available nurses (n=50) were included in the study. **Data collection tools:** Data were obtained through demographic data tool, nurses' knowledge questionnaire, Nurses performance check list, and factors affecting nurses' performance questionnaire. **Results:** more than half of the study nurses had unsatisfactory knowledge more than three quarters of them had unsatisfactory level of practice regarding cardiac catheterization. moreover, many factors affecting positively on their performance; as job satisfaction, Regulation inside the work and professional support related factors respectively, while communication related factors affecting positively on their performance. **Conclusion:** only about more half of studied nurse's had unsatisfactory level of knowledge and three quarters of the studied nurse's had unsatisfactory level of practices regarding nurses' performance for patient undergoing cardiac catheterization and many factors affecting negatively on their performance and other factor affecting positive on their performance. **Recommendations:** Designing in-service training and educational program to improve nurses' knowledge and practice assess nurses' performance regarding patients undergoing cardiac catheterization.

**Keywords:** Performance, cardiac catheterization.

### Introduction

During a cardiac catheterization a long thin flexible catheter, is inserted into any artery or vein in the groin or arm. While watching the catheter on the X-ray, the catheter is then passed through the artery or vein to the heart (*Clive, & Face, 2014*).

Once the catheter is place, pressures in the heart are measured. An X-ray angiogram (motion picture X-ray) of the heart and blood vessels is taken. This is done while injecting an iodinated colorless "dye" or contrast material through the catheter. An angiogram of the coronary arteries is obtained by injecting the contrast material into the opening of a coronary artery. X-ray movies are taken during the injection of the contrast material allowing the

blood flow through the coronary arteries to be visualized (*Andro, Strephen & Mazier, 2015*). The coronary arteries are vital because they supply oxygen and nutrients to the heart muscle. Without blood flow, the muscle would sustain temporary or permanent damage in the form of a myocardial infarction (heart attack). The catheter can be placed to view the left side of the heart or the right side it inserted into a vein to perform a right heart. The catheter is inserted into any artery to perform a left heart catheterization (*Gianfranco & Messimo, 2014*).

A right heart catheterization is often performed to assess for pulmonary hypertension, congenital heart disease, and disease of the heart valve or certain conditions involving the

pericardium (the fluid filled sack surrounding the heart). A left heart catheterization is often performed to assess for narrowing or blockage of the coronary arteries and assess the function of the heart muscle (*Mazen, 2016*).

It is important to understand nurses perceptions and to comprehend what factors influence their views. Many factors may affect how nurses caring of patient undergoing cardiac catheterization and affecting their ability to apply its components such as lack of nurses knowledge about caring of patients undergoing cardiac catheterization inadequate time, shortage of nursing staff, increased work load and unavailability of supplies and equipment's (*Luen, 2015*).

### **Significance of the study**

According to cardiac care units and cardiac catheterization units university statistical report during (2014-2015) revealed that the total number of admitted patients was 3600 patients (Beni Suef University Hospital, Archive) Cardiac catheterization may associated with complication and angioplasty is associated with the same complication related to manipulation of the coronary artery itself may also occur. The most common serious complication include a 2% to 10% incidence of complete occlusion of the vessel (abrupt closure), acute myocardial infarction (MI) (1%-5% incidence) and the need for emergency coronary artery bypass surgery (1%-2% incidence) (*Burns, 2014*).

Data generated from this study could help in planning and managing care as well as training adequately the personal responsible for the provision of care (*Burdette, Taylor & Kass, 2012*).

### **Aim of the study**

The aim of this study is to assess nurses' performance regarding patients undergoing cardiac catheterization through the following:

- Assess nurses' level of knowledge regarding patients undergoing cardiac catheterization in cardiac care units.

- Assess nurses' level performance regarding patients undergoing cardiac catheterization in cardiac care units.

- Assess factors affecting on nurses performance regarding patients' undergoing cardiac catheterization in cardiac care units.

### **Research question**

The current study answered the following questions.

- What are the Nurses' performance regarding caring for patients undergoing cardiac catheterization in cardiac care units?

- What are factors affecting on nurses performance regarding caring for patient undergoing cardiac catheterization?

### **Subjects and Methods**

#### **Research Design:**

A descriptive explorative design was utilized for the conduction of this study. An exploratory descriptive research design was adapted to fulfill the aim of the study and answer the research questions.

#### **Setting of the Study:**

The study was conducted at Cardiac Care Unite of Beni -suef University Hospital.

#### **A- Subject:**

Convenience sample of all available nurses (50 nurses) who providing care for patients undergoing cardiac catheterization at the previously mentioned setting. The nurses had different qualifications and had different years of experiences and from both sexes.

#### **Data Collection tools**

Data were collected using the following tools:

#### **1-Self-administered questionnaire**

Was used to assess nurses level of knowledge regarding patients undergoing cardiac catheterization in cardiac care units, it was developed by the investigator in a simple Arabic language based on recent and relevant literature *Wami, (2014)* it include the following two main parts: **A-Part one: Socio demographic characteristics of nurses** under this study as (age, sex, qualifications, marital status, years of experience, previous attendance of training courses regarding patients undergoing cardiac catheterization in cardiac

care unites) **B- part two** concerning with nurses level of knowledge regarding caring of patients undergoing cardiac catheterization. Which adapted from *Aferu, (2016)* and developed by the researcher based on recent literature. It was written in an Arabic language. It include 27 questions, in the form of multiple choice questions (MCQs). The questions were divided into 11 parts namely:

- Anatomy and physiology of the heart (N=7).
- Causes of CAD (N=5).
- Definition of Cardiac catheterization (N=1).
- Indication of Cardiac catheterization (N=3).
- Types of Cardiac catheterization (N=5).
- Nursing role pre procedure (N=13).
- Nursing role during procedure (N=7).
- Nursing role post procedure (N=16).
- Complications of cardiac catheterization (N=13)
- Factors affecting on nurses performance for patients undergoing cardiac catheterization (N=20).

**Scoring system:** The correct answers were given of "1" grade, while the incorrect answer were given a score of zero. A total score for questionnaire was 35 grades. Score less than 75% was considered unsatisfactory and the score equal or more than 75% considered satisfactory.

**11) Nurses' practice Observational checklist:** This tool adapted from (**Harald Lapp & Ignokra Kan, 2014**) and modified by the researcher to suite the study aim. It was written in an English language and used to assess nurses' level of practice regarding patients undergoing cardiac catheterization. It composed of (three) items covering the following:

- Nursing role pre procedure of cardiac catheterization.
- Nursing role during procedure of cardiac catheterization.
- Nursing role post procedure of cardiac catheterization.

**Scoring system** classified as follows: The statement as step done was given score of (1) grade and statement or step not done was given score zero grade. A total score for the checklist was 75 grades. Score less than 75% considered incompetent level of practice (unsatisfactory) and the score equal or more

than 75% considered competent level of practice (satisfactory).

**III) Factors affecting nurses' performance questionnaire:** This tool adapted from (**Hall, 2015**) and modified by the researcher to suite the study aim. It was written in an Arabic language and used to assess factors affecting nurses' performance regarding caring for patients undergoing cardiac catheterization in cardiac care units. It divided into 3 parts namely: nurses' related factors (Job satisfaction and communication with patients and with others), health setting related factors (regulation inside the work and availability of professional support of care of patients) and patients' related factors (communication). Participants were asked to respond on a 3-point Likert Scale (Yes & No). **Scoring system:** the answer "yes" scored "1"grade and the answer "No" scored zero grade. A total score for questionnaire was 32 grades. Score less than 60% was considered negative effect and the score equal or more than 60% considered positive effect.

#### **Pilot study**

A pilot study was carried out on 10 nurses from the study subjects to test the clarity, applicability, feasibility and relevance of the tools used and to determine the needed time for the application of the study tools. The nurses who were included in the pilot study were included to the study subjects because no modification was done after conducting pilot study.

#### **Ethical considerations**

The ethical research considerations in this study included the following:

1-The research approval of protocol was obtained from Scientific Research Ethical Committee in Faculty of Nursing at Ain Shams University before starting the study.

2-The researcher clarified the objective and aim of the study to the nurses and patients were included in the study.

3-The researcher assured maintaining anonymity and confidentiality of the subjects data.

4-Nurses were informed that they allowed choosing to participate or not in the study and that they had the right to withdraw from the study at any time without giving any reasons.

5-Ethics, values, culture, and beliefs were respected.

## Result

**Table 1 shows** that the mean age of the studied nurses was  $25.41 \pm 48.05$ , 62% of the studied nurses were between 20-29 years, regarding the sex 56% were females, more than half of studied nurses were single, according to educational level, only around 40% of the study subjects were Bachelor degree, as well as 42% of the study subjects had less than 1 year of experience in cardiac care unit, regarding nurse /patients ratio, was 44% had 1: 2 ratio and 66% of them were not trained on cardiac catheterization.

**Table 2 shows** that, 50% of the studied nurses had satisfactory level of knowledge regarding the

**Table (1): Demographic characteristics of studied nurses**

Items	Frequency	Percent	
<b>Age</b>	<20	16	%32
	20<30	31	62%
	30 and more	3	6%
Mean $\pm$ SD 25.41 $\pm$ 48.05			
<b>Sex</b>	Male	22	44%
	Female	28	56%
<b>Marital status</b>	Single	28	56%
	Married	22	44%
<b>Education level</b>	Diploma	13	26%
	Technical institute	17	34%
	Bachelor	20	40%
<b>Experience years</b>	<1	21	30%
	1<5	15	28%
	5 $\geq$	14	22%
<b>Patient nurse ratio</b>	1:1	10	20%
	1:2	22	44%
	1:3	14	28%
	1:>5	4	8%
<b>Training</b>	Yes	33	66%
	No	17	34%

anatomy of the heart; also 32% of them had satisfactory level of knowledge regarding function of the heart, definition of cardiac catheterization and their nursing role before cardiac catheterization. Also 34% had satisfactory level regarding indication of cardiac catheterization and nursing role during cardiac catheterization, 42% had satisfactory level regarding nursing role post cardiac catheterization, 88% had unsatisfactory level regarding post cardiac catheterization complication and concerning the total score of knowledge level regarding patients undergoing cardiac catheterization, only 40% of the studied nurses had satisfactory level total of knowledge and 60% of the studied nurses had unsatisfactory level of the total knowledge.

**Table 3 shows** that 82% of the studied nurses had unsatisfactory level of total practices regarding caring of patients undergoing cardiac catheterization.

**Table 4 shows** that, 31% of the studied nurse reported that total factors scale affecting positively on their performance.

**Table (2): Distribution of Studied Subjects in Relation to their Total Scores Percentages of Knowledge.**

Items	Satisfactory		Unsatisfactory	
	No	%	No	%
-Anatomy of the heart	25	50%	25	50%
- Function of the heart.	16	32%	34	68%
-Definition of cardiac catheterization	16	32%	34	68%
-Indication of cardiac catheterization	17	34%	33	66%
- Nursing role before cardiac catheterization	16	32%	34	68%
Nursing role during cardiac catheterization.	17	34%	26	52%
Nursing role post cardiac catheterization.	21	42%	29	58%
Post cardiac catheterization complication.	6	12%	44	88%
<b>Total score of knowledge</b>	<b>20</b>	<b>40%</b>	<b>30</b>	<b>60%</b>

**Table (3): Distribution of Studied Subjects in Relation to their Total Scores Percentages of practice.**

Items	Satisfactory		Unsatisfactory	
	No	%	No	%
1- Pre cardiac catheterization	8	16%	42	84%
2- During cardiac catheterization	20	40%	30	60%
3- Post cardiac catheterization	7	14%	43	86%
<b>TOTAL</b>	<b>9</b>	<b>18%</b>	<b>41</b>	<b>82%</b>

**Table (4): Distribution of the total factors**

Items	Satisfactory		Unsatisfactory	
	No	%	No	%
1-Communication within the work environment	25	50%	25	50%
2- Regulation inside the work	14	28%	36	72%
3-Availability of professional support of care of patients	20	40%	30	60%
4- Extent of job satisfaction	21	58%	29	42%
<b>Total factors scale</b>	<b>8</b>	<b>31%</b>	<b>42</b>	<b>69%</b>

## Discussion

Coronary artery disease touch the lives of millions of patients and their families, together with those who provide and plan care, those responsible for planning and finding care especially in developing countries like Egypt. Indeed WHO estimates that 60% of the global burden of CAD occurs in developing countries (Cliven & Face, 2014).

The current study was carried out to Assess Nurses Performance Regarding Patients Undergoing Cardiac Catheterization in cardiac care units. Discussion of the findings of this study will cover the main parts of the result.

**Discussing the findings of the current study** was categorized under six main parts. **The first part** concerned with demographic characteristics of nurses included in the study. **The second part** display the findings that related to studied nurses' level of knowledge regarding caring of patients undergoing cardiac catheterization. **The third part** discuss nurses' practice regarding caring of patients undergoing cardiac catheterization. **The fourth part** reveal factors affecting nurses' performance regarding caring of patients undergoing cardiac catheterization.

**Part 1: demographic characteristics of the studied nurses age, sex, qualifications, years of experience, and training courses.**

Regarding the studied nurses demographic characteristics, the current study revealed that, about more than half of the nurses were at the age group (20 >30). In investigator point of view this could be explained in the light of nature of CCUs as area of especially necessitates as young qualified nurse for better quality of nursing care offered and ability to tolerate the working load. This result was agreed with (*Said, 2012*), who stated that more than three fifths of nurses age were less than thirty years old and disagree with (*El Feqi, 2013*), who found that, more than half of their study aged group from 30 years and above.

The present study showed that, most of the nurses were females. It might be related to nursing schools graduate large number of females than males. This finding was in the same line with (*Arathy, 2011*), who studied Assessment of the knowledge and practice a mange cardiac nurses about patient safety after cardiac catheterization which reported that the most of study subjects were females nurses versus males. But it is inconsistent with (*Elauoty, 2013*), who conducted a study about Assessment of nurse's performance regarding medication administration safety in ICUs and found that most of their study group were males.

As regards to marital status, the present study indicated that most of the study group were single. Investigator point of view this could be related to the young age of the nurses working in CCU, this was inconsistent with (*Malk, 2013*), who conducted a study about Assessment of nurse's knowledge and practice in cardiac dysrhythmia among critical ill patients at Benha University and stated that majority of nurses who working in intensive and CCUs were married and also agree with (*Doenges et al., 2014*), **Who studied** Assessment of Nurses' Knowledge, Attitude, and Perceived Barriers to Expressed Pressure Ulcer Prevention Practice, **which reported that**

more than two thirds of the study subjects were single

Concerning level of education, results revealed that about more than one third of nurses under study were having bachelor degree. In investigator point of view, this may be due to a lot of bedside nurses in governmental hospitals bachelor due to shortage of staff nurses. These results were agreed with (*Al Kharabsheh et al., 2013*), **Who studied** Exploring Nurses' Knowledge and Perceived Barriers to Carry out Pressure Ulcer Prevention and Treatment, Documentation, and Risk Assessment and **who reported** that the majority of the study subjects were having bachelor degree. But inconsistent with (*AlOyce, Leshabari and Brysiewicz, 2014*) **who studied** Knowledge and attitudes of health professionals towards pressure ulcers at a rehabilitation hospital: a cross-sectional study, and **who reported** that more than one third of nurses were diploma graduate from nursing schools.

Concerning years of experience, the present study revealed that less than half of the nurses had less than one years of experience in CCU. This explains the reason of inadequacy of nurse's knowledge, practice and regarding caring of patients undergoing cardiac catheterization. This could be explained in the light of nature that safety and maintenance of the procedures and treatments initiated are crucially dependent on experienced nursing care, with constant bedside observation to ensure monitoring and immediate detection of any problems so that they can be rapidly assessed and treated.

This study was agree with (*Aloyce et al., 2014*), who conducted a study about Assessment of knowledge and skills of triage among nurses working in emergency centers in Dare Salaam, Tanzania and found that, majority of nurses had 1-10years of experience. And also disagree with

(*Gafer, 2015*), who conducted a study about Assessment of nurses performance regarding medication administration for patient with acute MI and found that half of nurses had experience more than 10 years.

Regarding training program, the present study found that more than half of nurses didn't attend training program regarding caring of patient undergoing cardiac catheterization. This may be due to lack of in-service education program inside the hospital. This study finding was supported by (*Mousa, 2014*), who conducted a study about Evaluation of nurses knowledge and preparation of patients undergoing cardiac catheterization and found that the majority of nurses had no training program regarding caring of patient undergoing cardiac catheterization.

### **Part 2: Nurses' level of Knowledge regarding caring of patents undergoing cardiac catheterization.**

The current study revealed that, the majority of nurses under study had unsatisfactory level of knowledge about Anatomy of the heart, Function of the heart, Definition of cardiac catheterization, Indication of cardiac catheterization, Nursing role before cardiac catheterization, . Nursing role during cardiac catheterization, Post cardiac catheterization complication and Nursing role post cardiac catheterization. This might be related to lack of in service educational program and training courses, low level of qualification of nurses under study as majority of them were got bachelor nursing and absent of procedure book, protocol and policy regarding caring of patients undergoing cardiac catheterization in CCU. This finding was supported by (*Omran, 2010*), who conducted a study about Nursing performance in management and prevention of complications for patients undergoing cardiac

catheterization and found that their knowledge was unsatisfactory, while, (*Sanders et al., 2012*), who conducted a study about Assessment of nurses knowledge regarding patients undergoing cardiac catheterization among staff nurses in selected hospital in Bangalore and found that their knowledge was moderately adequate.

Concerning the nurse's knowledge about their role regarding patients undergoing cardiac catheterization, the majority of nurses were having unsatisfactory level of knowledge before, during and post cardiac catheterization this disagree with (*Arathy, 2011*), who conducted a study about Assessment the knowledge and practices among cardiac nurses about patient safety after cardiac catheterization and found that their knowledge before, during and post cardiac catheterization was acceptable.

Concerning the nurse's knowledge regarding post cardiac catheterization complications, this study finding revealed that the majority of them had unsatisfactory level of knowledge regarding complications of cardiac catheterization and its management. This study finding was consistent with (*Mousa, 2014*), who reported that the nurses have inadequate knowledge about management of cardiac catheterization complications.

Concerning the nurse's knowledge about their role regarding patients undergoing cardiac catheterization, the majority of nurses were having unsatisfactory level of knowledge post operative care including; the optimal frequency of vital signs measurement after cardiac catheterization, ambulation time and importance of early ambulation and instructions that should be avoided during six hours following cardiac catheterization.

According to (*Abd El Hamed, 2013*), who conducted a study about "Effect of

implementing a critical pathway on health outcome of patients undergoing PCI" and reported that monitoring vital signs as the mean pulse rate, body temperature, respiratory rate, blood pressure and oxygen saturation is an important aspect of PCI care to monitor major complications.

### **Part 3: Nurses' level of practices regarding caring of patients undergoing cardiac catheterization.**

Nurses should demonstrate competencies throughout their professional careers: Thus nurse's practice in cardiac catheterization must be appraised in order to ascertain the level of competency.

Concerning the level of practices pre cardiac catheterization, findings of this study documented that all the studied nurses had unsatisfactory level of practice regarding caring of patients undergoing cardiac catheterization. This may be due to lack of supervision from senior staff, increased workload and highly qualified nurses perform administrative work. This finding agree with *(Rolley & Johnx, 2010)*, who conducted a study about Assessment of nursing care practice following cardiac catheterization They found that cardiac catheterization nurses practice was poor in general. While the study finding is disagree with *(Omran, 2010)*, who assessed nurses practice in prevention and management of complications for patients undergoing cardiac catheterization and found that nurses practice was satisfactory.

Concerning the level of practice during cardiac catheterization findings of this study documented that all the studied nurses had unsatisfactory level of practice regarding caring of patients undergoing cardiac catheterization. This disagree with *(Johan, Ulfstenstrand, Tim and Johansson 2017)*, who conducted a study

about effect of early mobilization for patients undergoing coronary angiography and found that nursing role during cardiac catheterization procedure and in the catheterization lab was satisfied.

Concerning the level of practice post cardiac catheterization, findings of this study documented that all the studied nurses had unsatisfactory level of practice regarding caring of patients undergoing cardiac catheterization. This agree with *(Mohammedy, 2013)*, who conducted a study about Early ambulation after disgnostic transfemoral cardiac catheterization and found that nursing role post cardiac catheterization unsatisfied and most complications due to lack of nursing role post cardiac catheterization and this disagree with *(Feky, 2003)*, who conducted a study about Effect of nursing interventions on the condition of patients undergoing diagnostic cardiac catheterization and found that nurses play an important and satisfied role post cardiac catheterization .

Moreover, the findings of the current study illustrate that majority of nurses were having unsatisfactory level of practice regarding caring for patients undergoing cardiac catheterization.

### **Part 4: Deal with factors affecting of nurses performance regarding caring of patients undergoing cardiac catheterization:**

The current study revealed many factors affecting on nurses performance mainly nursing related factors, Communication within the work environment, Regulation inside the work, Availability of professional support of care of patients, Extent of job satisfaction.

**Regarding Factors related to communication within the work environment,**

the current study revealed that, half of nurses reported good communication skills which affected positively on their performance. This finding was supported by (*Hamdy 2017*), **who studied** Nurses' Performance Regarding Pain Management of Patients with Acute Myocardial Infarction, **who reported** that more than two third of nurses were good communication skills.

**Regarding Regulation inside the work related factors**, the current study revealed that less than half of nurses reported that regulation inside the work and ratio nurses to patients affect on their performance. It might be due t. **This was unsupported by (*Hamdy, 2017*), who studied** Nurses' Performance Regarding Pain Management of Patients with Acute Myocardial Infarction, **which reported** that, more than two third of nurses reported absence of regulation in side the work.

**Regarding Factors related to Availability of professional support of care of patients**, the present study revealed that most of nurses under study reported no professional support, there is no guideline and procedure book in CCU and this may be a leading factor for their inadequate practices. The development of guidelines can move forward and preventive protocols can be a lengthy process. This finding was agrees with (*Elen, 2013*), **who studied** Nurses' knowledge and Perceived Barriers About Pressure Ulcer Prevention for Admitted Patients in Public Hospitals, and **who mentioned** that availability of procedure books and implementation of the standard of nursing improve nurses' practices and ensure quality of care.

**Regarding Extent of job satisfaction related factors**, the current study revealed that less than half of nurses reported that absence of motivation and unsuitable salaries for the pressure produced a within the work

environment considered barriers affecting positively on their performance. This finding affect on their achievement that affect on their performance regarding caring of patients undergoing cardiac catheterization. This was supported by (*EIFeqi, 2013*), who reported that nurses spent more than third of their time in the work and had insufficient salaries and benefits.

## Conclusion

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Only about more half of studied nurse's had unsatisfactory level of knowledge and three quarters of the studied nurse's had unsatisfactory level of practices regarding nurses performance for patient undergoing cardiac catheterization and many factors affecting negatively on their performance and other factor affecting positive on their performance

## Recommendation

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1- Continuous evaluation of nurses' knowledge and practice is essential to identify their needs in CCU about caring of patients undergoing CC

2- A simplified and comprehensive booklet including guidelines about caring of patients undergoing CC

3- An orientation program should be prepared to help the newly appointment nurses to revise, acquire and develop the knowledge and practice regarding caring of patients undergoing CC.

4- In-service training program must be developed based on need assessment for nurses in relation caring of patients undergoing CC and evaluating the effect of its implementation on their performance and patients' outcome.

5- Further research is recommended to evaluate the effect of training program on

nurse's performance regarding caring of patients undergoing CC.

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