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### Assessment of Nurses' Performance Regarding Standards of Care for Patients Undergoing Cardiac Catheterization Patients



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#### ABSTRACT

**Background;** Standard is a predetermined baseline condition as level of excellence that comprises a model to be followed and practiced. It is used as a measurement tool; A nurse is judged against the standards of care that have been established within the profession and specialty area of practice. Nursing performance has been defined as a set of nursing activities or behaviors that are performed by nurses and directed toward the recovery and well-being of the patients assigned to their care Cardiac catheterization is a valuable diagnostic procedure which does a comprehensive examination of how the heart and its blood vessels function. **Aim;** to assess nurses' performance regarding the standard of care of patients undergoing cardiac catheterization **Design;** Descriptive exploratory research design was utilized to achieve the aim of the study. **Sample;** a purposive sample of staff nurses (150) working in the selected units during the time of data collection. **Setting;** the study conducted at Cairo University Hospital and at

2 units in Kasr El- Einy hospital. **Tools;** Three tools used to collect data. Tool I: Knowledge questionnaire sheet. Tool II: Observation Checklist, Tool III: Attitude Scale. **Results;** It shows that majority studied nurses had satisfactory knowledge, competent practice, and positive attitude regarding standards of care for cardiac catheterization patients. It clarifies that, there was highly statistically positive correlation between total score of knowledge, practice, and attitude regarding cardiac catheterization procedure among the studied nurses. **Conclusion:** The most of the studied nurses have a satisfactory level of knowledge, practice, and attitude regarding cardiac catheterization standards. **Recommendations:** Continuous in-service training program needed, Continuous evaluation of nurses' knowledge, practice and attitude is essential to identify nurses' needs to correct the defect. Repeat the study on a larger sample and in different geographical areas in Egypt is recommended for generalization of findings.

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**Key words:** Standards of care, nurses' Performance, Cardiac catheterization



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### Introduction

Coronary catheterization is an invasive procedure that aim at visualization of the coronary arteries to determine its patency and describes the percentage of occlusion. It is done through inserting a thin flexible wire into either the femoral artery or the radial artery and threaded toward the heart through the ascending aorta, at this point a catheter is guided over the wire into the ascending aorta to engage through the coronaries to start the assessment (Coomes et al., 2020).

Nurse has a specialized role wherever works as a team member of different surgical health care professionals. Therefore, Absence or limitation of good teaching and preparation pre-operative will increase the necessity for more surgical support to managing underlying medical conditions expected to occur. Cardiac catheterization had several complications that embrace the following: infection, injury and pain at the IV or sheath insertion site, blood clots and harming urinary organ may occur because of the distinction dye that common in kidney disease and patients with DM (Elgazzar & Keshk, 2018).

Nursing profession has established standards of practice through the American Nurse Association the professional body for all professional nurses in the country, and these standards serve as a guideline for peer evaluation, employee assessment and self-evaluation of nursing practice according to the latest theories and techniques advances associated with the practice of professional nursing (Furby, 2020).

Nursing care standards are powerful tools that can help drive innovation and increase productivity. They can make organizations more

successful and people's everyday lives easier, safer and healthier. Standard setting includes establishing fundamental definition in nursing and determining qualifications for education and practice (Thabet et al., 2019).

Evaluating nursing work performance is a challenge because the construct is poorly defined in the literature and mostly operationalized in terms of competencies, nursing-sensitive quality indicators, and task-specific performance measures. Competencies and task-specific measures that focus primarily on knowledge and skills are limited in terms of their ability to capture performance changes during work as they are either administered once when entering into the profession or periodically. Nursing-sensitive quality indicators are used to indicate the quality of nursing care or practices that patients receive through patient outcomes such as pressure ulcers, nosocomial infections, or falls. However, these indicators are unit level measures that do not assess the individual performance of the nurse. Moreover, most of these indicators have a lag time between the provision of nursing care and the outcome (Mustafa et al., 2020).

Nurses, as professionals, are committed to the development and implementation of practice standards through the ongoing acquisition, critical application and evaluation of relevant knowledge, skills, attitudes and judgment. Standards are foundational to the promotion of safe, competent and ethical nursing practice. Nursing practice is a synthesis of the interaction among the concepts of person, health, environment and nursing (Hessels & Wurmser, 2020).

### Significance of the study

Cardiovascular diseases (CVDs) are the major cause of death, globally. Approximately, 56.4 million deaths were reported worldwide in 2015. Out of 56.4 million deaths, 30 million were due to the top 10 major causes, which also included Ischemic Heart Disease (IHD), and stroke. IHD and stroke are the

leading cause of death which remained responsible for 17.5 million deaths alone (Mensah, Roth, & Fuster, 2019).

Cardiac catheterization, including coronary angiography and angioplasty, is a standard diagnostic



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and therapeutic strategy for the evaluation of cardiovascular diseases. Even in the United States, more than one million patients undergo percutaneous coronary intervention (PCI) each year. It can be performed via radial, ulnar, femoral, or brachial arteries through a sheath. The sheath is a small flexible catheter, introduced as a guide for wires, stents, and balloons during diagnostic and (PCI) (Sania et al., 2022).

Nurses are the largest group offering services to patients in the health care organizations. Therefore, it's necessary to pay attention to the assessment to their knowledge, practice and attitude in clinical care in relation to standards. to enhances patient care, patient satisfaction rates, and promotes nursing profession status (Gaudino et al.,2019)

### Aim of the study

This study was aimed to assess nurses' performance regarding the standard of care of patients undergoing cardiac catheterization.

### Research question

Are the nurses following the standards of care for cardiac catheterization patients.

### Subject and Methods

#### Technical Design:

**The technical design includes research design, setting, subject and tools for data collection.**

#### Study design

Descriptive exploratory research design was utilized to achieve the aim of the study.

#### Study Setting:

The study was conducted at two cardiac catheterization units affiliated to two departments at Al-Kasr Al-Aini Hospitals:Critical Care Unit. and 23 department.

#### Subjects:

purposive sample (n=150) of nurses working in 2 departments in Al-Kasr Al-Aini Hospitals were included in this study and it was composed of all available staff nurses with one or more years of experience in caring for cardiac catheterization patient before, during and after procedure.

#### Tools for data collection:

Three tools were used for data collection, as the following:

**1<sup>st</sup> Tool: "Knowledge questionnaire sheet"** by *Elgazzar and Keshk, (2018)*, and it was modified by the investigator. **It consists of two parts:**

**Part 1:** It included the personal and work-related data of the staff nurses in the study. It includes the gender, age, years of experience.

**Part 2:** The questionnaire sheet was used to determine the nurse's knowledge regarding standards of care of cardiac catheterization and it consisted of 45 questions with a total score (90), which classified to multiple choice (18questions) and true or false were (27question). Each right answer was given two score (2), and the wrong answer code was one score (1) (Bakr et al.,2020), it is divided into 7 sections as follow: 1-Definition and Objectives of cardiac catheterization (6 items) ,2-Preparations for cardiac catheterization (6 items).3-Role of nurse before cardiac catheterization (11 item). 4-Role of nurse during cardiac catheterization (6 items),5-Role of nurse after cardiac catheterization (5 items),6-Role of nurse in prevention of complication (6 items),7-Role of nurse in health education (5 items).

#### Scoring system:



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- Satisfactory  $\geq 68$  score (75%).
- Un-satisfactory level  $<68$  score (75%).

**2<sup>nd</sup> Tool:** Observation Checklist for nurses' performance regarding standards of Care for patients undergoing cardiac catheterization (Appendix II). This tool adapted by the researcher based on (Yassin, 2014), it was used in this study to assess nurse's practice when caring for patients undergoing cardiac catheterization in relation to standards. It consists of nursing care standards in three domains to investigate practice of nurse before, during and after cardiac catheterization. It includes (75 items) distributed as follow: 1) **Nursing care pre catheterization** which includes four standards (32 items): The 1<sup>st</sup> standard (the nurse of CCU shall perform nursing assessment for patient undergoing cardiac catheterization) include (4 items), The 2<sup>nd</sup> standard (staff nurse shall provide the patient with pre procedural care as ordered) includes (9 items), The 3<sup>rd</sup> standard (the staff nurse shall provide the patient with adequate pre-procedure instructions) includes (14 items). The 4<sup>th</sup> one (staff nurse shall provide the patient with adequate information about the post catheterization regimen) includes (5 items). 2) **Nursing care during catheterization** which includes three nursing standards (22 items) as follow: The 5<sup>th</sup> standard (Staff nurse shall function as a member of the cardiac catheterization team to prepare the catheterization lab for a procedure) includes (4 items), The 6<sup>th</sup> standard (staff nurse shall apply appropriate aseptic surgical techniques) includes (8 items), The 7<sup>th</sup> standard (staff nurse shall provide individualized patient care) includes (10 items). 3) **Nursing care post cardiac catheterization** which includes five nursing standards (21 items) as follow: The 8<sup>th</sup> standard (staff nurse shall perform nursing assessment for the patient initially after catheterization) includes (3 items), The 9<sup>th</sup> standard (staff nurse shall provide the patient with appropriate nursing care after catheterization to ensure comfort and safety) includes (6 items), The 10<sup>th</sup> standard (the nurse shall notify the physician if any of the post procedure complications occurs immediately) includes (3 items), The 11<sup>th</sup> standard (staff nurse shall document all post procedure observation for the patient on nursing records) includes (3 items), The 12<sup>th</sup> standard (staff nurse shall provide discharge instructions or the patient and his family) includes (6 items).

### Scoring system:

responses were measured on three-point Likert scale used to assess nurses' practice, ranging from (2 indicates done correctly), (1 = done incorrectly and not done). The total score was 150 degree (Yassin, 2014).

- Competent practice level  $\geq 113$  (75%).
- In-competent practice level at  $<113$  (75%).

**3<sup>rd</sup> Tool:** Scale of attitude toward the Standards of Care of Patient Undergoing Cardiac Catheterization: The tool was adapted from (Bakr & Shehab, 2020). It was modified by the researcher after reviewing the related literature (Bakr et al., 2020). It used to assess nurses' attitude regarding the standards of care of patients undergoing cardiac catheterization. It includes (15) closed ended questions, as the application of Standards of care for cardiac catheterization patients improves patient safety, there is enough time to work within standards etc.

### Scoring system:

For positive items: category for 5 Point Likert scale was (1= strongly disagree, 2= disagree, 3= Uncertain, 4= Agree & 5= Strongly Agree). While for negative items: category for 5 Point Likert scale was (5= strongly disagree, 4= disagree, 3= Uncertain, 2= Agree & 1= Strongly Agree). The total score was 75 degree.

Positive attitude  $\geq 57$  score (75%).

Negative attitude  $<57$  score (75%).

## Validity of the tools

### Tool Reliability



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The three tools were tested for its reliability; the stability aspect of the tool (consistency of the results over time) was assessed in a test -retest (2weeks interval). The internal consistency of the items composing the tool was assessed using Cronbach Alpha Coefficient version 26. The reliability of Questionnaire of knowledge regarding cardiac catheterization procedure, Observational Checklist regarding cardiac catheterization procedure and Scale of attitude toward the Standards of Care of Patient Undergoing Cardiac Catheterization were(0.883, 0.915 and 0.853)respectively.

### **Ethical considerations:**

Before the study was conducted, ethical approval was obtained from the scientific research and ethical committee of the faculty of nursing-Helwan University. Besides, the investigator obtained official permission from the director of Kasr Alainy hospital, where the study was conducted. Additionally, Ethics, values, believes and cultures of the study subjects were respected.

### **Pilot Study:**

A pilot study has been carried out on 10% of the total sample size (15 nurses) to test applicability and clarity of the tools, identify obstacles and problems that might be encountered during data collection, and to estimate the time needed to fill out the tool by nurses, this pilot sample was included in the study sample because the number of nurses was not exceeds the required sample as the study was at the corona(covid-19) time.

### **Field Work:**

The purpose of the study and the data collection tool were explained to the participants, The questionnaire was given to them individually by the investigator. The time spent to fill out the questionnaire ranged between 15 to 30 minutes, it was returned on the same day. This has been done on regular basis: three times on the week until all the data had been collected. After the final data were collected from all participants, Data were collected through three months period from April 2021 June 2021.

### **Administrative Design**

An approval to carry out this study has been obtained from the dean of the faculty of nursing-Helwan university, and an agreement from the director of selected units to get his approval to conduct the study, an oral consent has been obtained from the participants.

### **Statistical Design**

The collected data were organized, tabulated, and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 26. For all tests, a two-tailed p-value  $\leq 0.05$  was considered statistically significant, P-value  $\leq 0.01$  was considered highly statistically significant. While p-value  $> 0.05$  was considered not significant.

## **Result**

**Table (1)** As regard to personal characteristic of the studied nurses. It Illustrates that 62% of the age of the studied nurses was between 20-<33 years old with a mean age of  $35.47 \pm 8.86$ . Also, more than half (56%) of the studied nurses were female. While regarding educational level, more than two third (66%) of the studied nurses were bachelor nursing degree. Additionally, considering years of experience, around two third of them (60%) have experience  $< 5$  with the mean of  $5.13 \pm 2.28$ .

**Table (2)** shows correlation matrix between total score of knowledge, practice, and attitude regarding cardiac catheterization procedure among the studied nurses. It clarifies that, there was highly statistically positive correlation between



total score of knowledge, practice, and attitude regarding cardiac catheterization procedure among the studied nurses at ( $P=0.000$ ).

**Figure (1)** which illustrates percentage distribution of total of knowledge in relation to standards of care of cardiac catheterization among the studied nurses. It clarifies that more than four fifth (84.7 %) of the studied nurses had satisfactory knowledge in relation to standards of care of cardiac catheterization. In addition to presence of difference between observed and expected values with a high statistically significant difference at  $P = 0.000$ . Moreover, satisfactory to un-satisfactory level of knowledge ratio = 5.5:1.

**Figure (2)** represents percentage distribution of total attitude regarding cardiac catheterization procedure among the studied nurses. It clarifies that more than two third (66.7%) of the studied nurses had positive level of attitude regarding cardiac catheterization procedure, while the minority (33.3%) had negative attitude. In addition to presence of difference between observed and expected values with a high statistically significant difference at  $P = 0.000$ . Moreover, positive to negative level of attitude ratio = 2:1.

**Figure (3)** which illustrates percentage distribution of total knowledge, practice, and attitude regarding cardiac catheterization procedure among the studied nurses. It shows that majority studied nurses had satisfactory knowledge, competent practice, and positive attitude regarding cardiac catheterization procedure with the percentage of 84.7%, 83.3% & 66.7% respectively.

**Figure (4):** describes scatter dot that showing correlation matrix between total score of knowledge, practice, and attitude regarding cardiac catheterization procedure among the studied nurses. It clarifies that, there was highly statistically positive correlation between total score of knowledge, practice, and attitude regarding cardiac catheterization procedure among the studied nurses at ( $P= 0.000$ ).

**Table (1): Frequency distribution of personal characteristics among the studied nurses (n=150)**

Personal Characteristics		No.	%
Age (year)	▪ 20-<34	93	62.0
	▪ 35-<40	50	33.3
	▪ $\geq 40$	7	4.7
	▪ <b>Mean<math>\pm</math> SD</b>	35.47 $\pm$ 8.86	
Gender	▪ Male	66	44.0
	▪ Female	84	56.0
Educational Level	▪ Diploma nursing degree	16	10.7
	▪ Technical Institute of Nursing	35	23.3
	▪ Bachelor nursing degree	99	66.0
Years of experience	▪ <5	90	60.0
	▪ 5-<10	32	21.3
	▪ $\geq 10$	28	18.7





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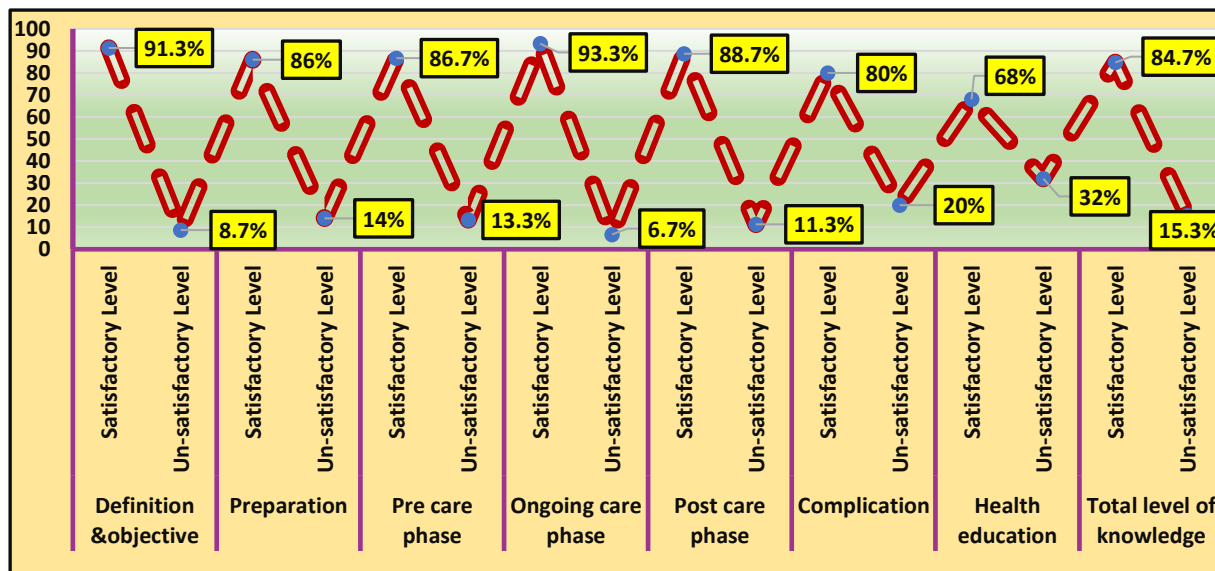
	▪ <b>Mean± SD</b>	5.13 ± 2.28	
Working units	▪ Critical units	94	62.7
	▪ Department	56	37.3
Attending training courses	▪ Yes	99	66
	▪ No	51	34

**Table (2): Correlation matrix between total score of knowledge, practice, and attitude regarding cardiac catheterization procedure among the studied nurses (n= 150).**

Items	Regarding Cardiac Catheterization Procedure		
	Total Knowledge	Total Performance	Total Attitude
Total knowledge score	R	0.959	0.955
	p-value	0.000**	0.000**
Total performance Score	R	0.959	0.963
	p-value	0.000**	0.000**
Total attitude Score	R	0.955	0.963
	p-value	0.000**	0.000**

*r*-Pearson Correlation Coefficient;

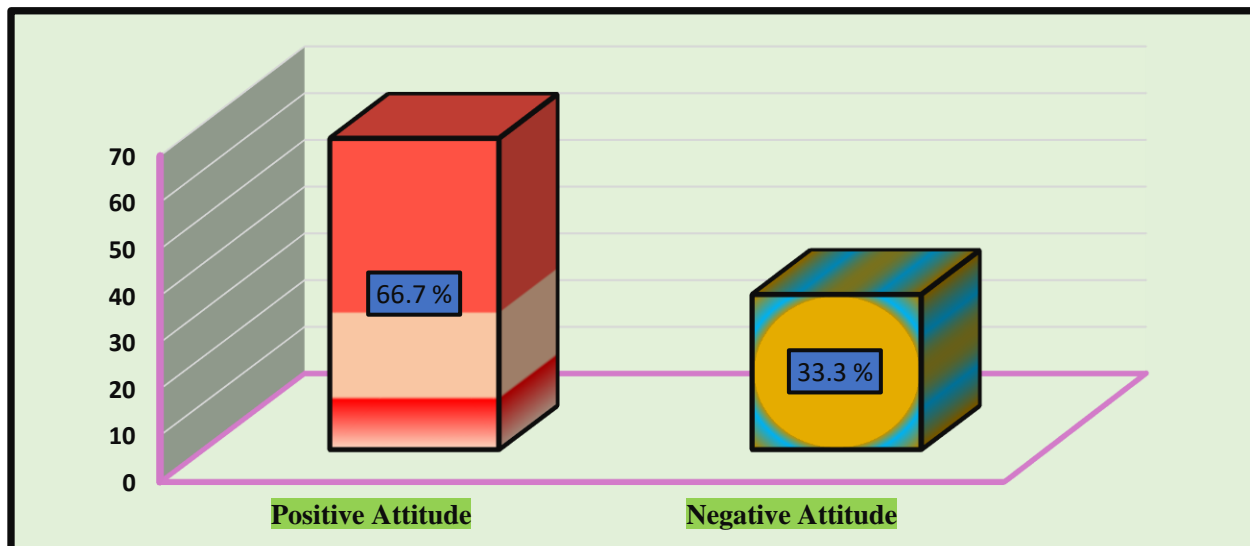
\*\*Highly significant  $p \leq 0.01$



$\chi^2=72.1, P= 0.000$

Ratio=5.5:1

**Figure (1) Percentage distribution of total knowledge in relation to standards of care of cardiac catheterization among the studied nurses (N= 150).**

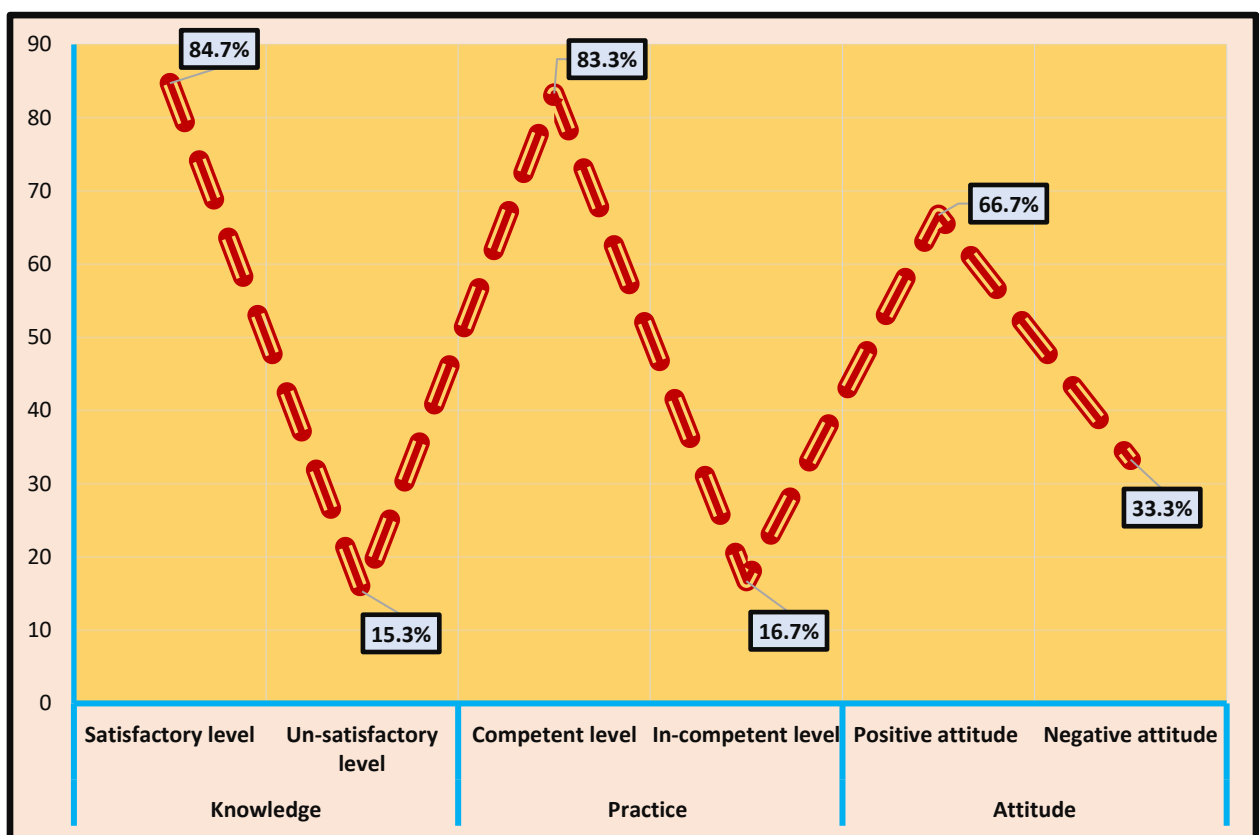




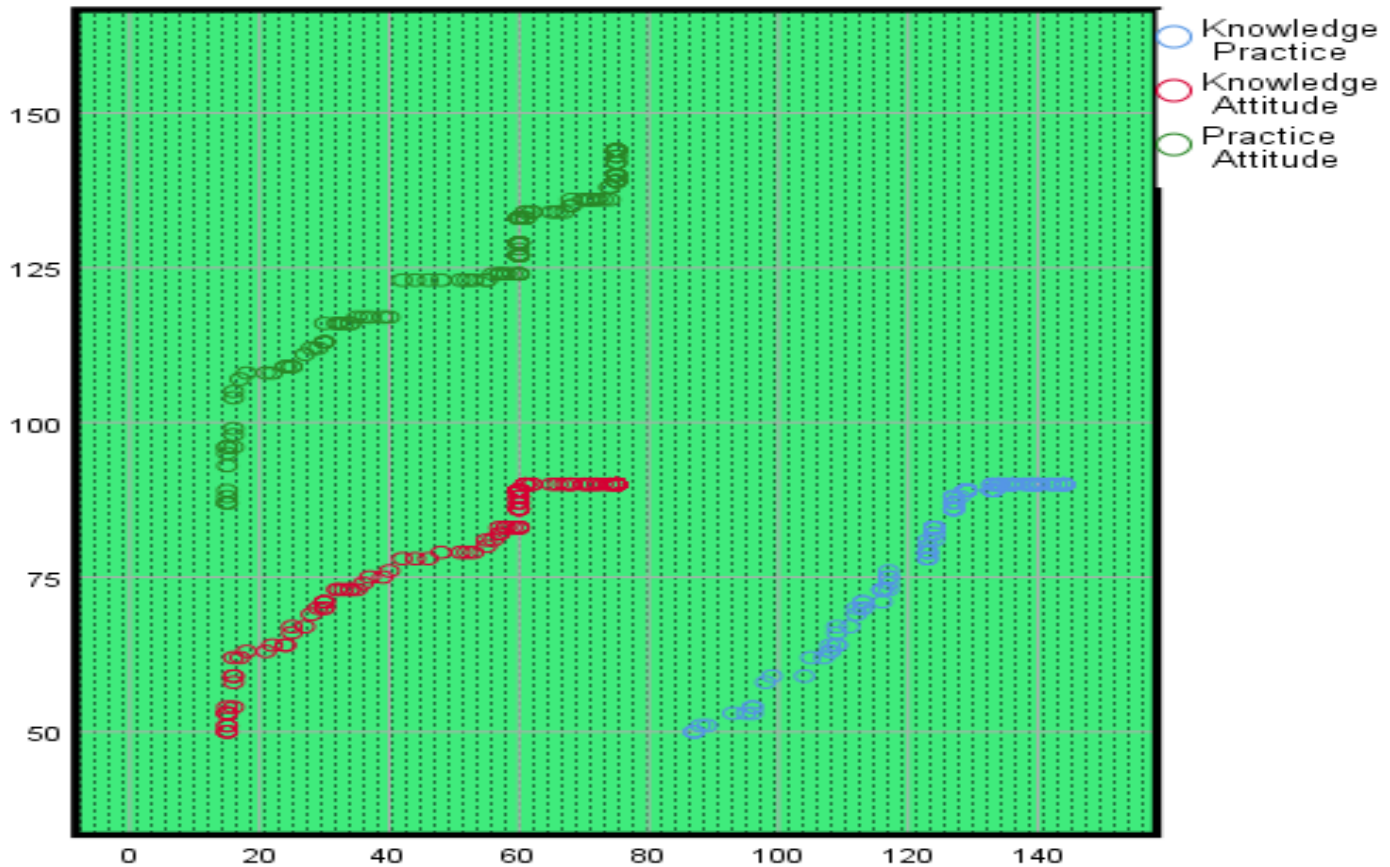
$\chi^2=16.6, P= 0.000$

Ratio=2:1

**Figure (2): Percentage distribution of total attitude regarding cardiac catheterization procedure among the studied nurses (n= 150).**



**Figure (3): Percentage distribution of total of knowledge, practice, and attitude regarding cardiac catheterization procedure among the studied nurses (n= 150)**



**Figure (4): Scatter dot showing the correlation between total score of knowledge, practice, and attitude regarding cardiac catheterization procedure among the studied nurses (n= 150)**

### Discussion

As regard to demographic characteristic of the studied nurses. It illustrated that more than two-thirds of the age of the studied nurses was between twenty to less than thirty-five years old with a mean age of  $35.47 \pm 8.86$ . This data was consistent with result of *Bakr et al., (2020)* which studied assessment of nurse's performance regarding care of patients undergoing cardiac catheterization, stated that majority of the studied nurses 'age was ranged between twenty to less than thirty years old. From the researcher point of view this may be due to newly graduated nurses in cardiac catheterization units, while higher age category 'senior nurses' perform administrative role.

Regarding total knowledge in relation to standards of care of cardiac catheterization among the studied nurses. It clarifies that more than four-fifths of the studied nurses had satisfactory knowledge in relation to standards of care of cardiac catheterization. In addition to presence of difference between observed and expected values with a significant statistical difference at  $P = 0.000$ . Moreover, satisfactory to un-satisfactory of knowledge ratio = 5.5:1.

These findings are concordance with result for *Davarpanah, et al., (2018)* which studied

knowledge and practice of nurses about nursing care before and after cardiac catheterization, concluded that



knowledge of nurses about nursing care before and after angiography were evaluated as good.

However, the study result was inconsistent with finding for *Keshk, & Elgazzar (2018)* which studied creating learning guideline for nurses caring for patients' safety undergoing cardiac catheterization, documented that the studied nurses had un-satisfactory knowledge pre implementation the learning guideline when comparing with post implementation the learning guideline. The study clarified that majority of nurses have a highly satisfactory level of knowledge and total score regarding patient safety on cardiac catheterization post implementation the learning guideline than pre learning guideline for the highly statistically significant difference

As well this finding contradicts the study results done in Mosul hospital, by *Mahmood et al (2021)* who assessed of nurses' knowledge of patient care after cardiac catheterization, indicated that knowledge regarding patient safety after cardiac catheterization of nurses working in medical and surgical ward were unacceptable.

From the researcher point of view, there was multiple causes helped the studied nurses to have a satisfactory knowledge. The 1<sup>st</sup> one is the age, the advantages of nurses in young age group are being active learners which is always required in such crucial /vital wards. The 2<sup>nd</sup> one is the education, most of them were holding a bachelor certificate which is a kind of benefit for gaining more knowledge.

In relation to total performance regarding cardiac catheterization procedure. The result clarified that more than four-fifths of the studied nurses had a competent performance regarding cardiac catheterization procedure while the minority had incompetent level. In addition to presence of difference between observed and expected values with a significant statistical difference at  $P = 0.000$ . Moreover, competent to in-competent ratio = 5:1.

The study finding was consistent with result for *AZIZ & AZIZE (2022)* which evaluated with

On other hand, the study finding contradicted by result outcomes for *Hasballah et al (2019)* which studied

assessment of nurse's knowledge and practices regarding pediatric cardiac catheterization at Sulaimani cardiac hospital, reported that majority of the studied nurses who worked in cardiac catheterization unit were in good practice.

This contrasts with the cross-sectional analytical study conducted in Pakistan by *Yaqoob et al., 2019* who reviewed knowledge and practices among nurses regarding patients' care following cardiac catheterization at a tertiary care hospital, concluded that most nurses were observed with unsatisfactory practices.

This could be due to increase years of experience in catheterization unit which is always required in such crucial and vital units. This may be interpreted by high level of nurses' knowledge reflected on their practice; knowledgeable nurses provide more accurate care.

Regarding attitude of the studied nurses in relation to cardiac catheterization procedure. It clarifies that more than two third of the studied nurses had a positive attitude regarding cardiac catheterization procedure, while the minority had a negative attitude. In addition to presence of difference between observed and expected values with a significant statistical difference at  $P = 0.000$ . Moreover, positive to negative ratio = 2:1.

These results were similar to those of finding for *El Sayed et al., (2017)* which reviewed nurses' performance regarding safety measures in cardiac catheterization unit at Benha university hospital and suggested guidelines, found that the majority of the studied nurses had a positive attitude toward teamwork climate, safety climate and job satisfaction.

On the same direction finding conducted in Turkey by *Kilicli, et al., (2019)* which studied attitude, source of knowledge, and supporting factors on evidence-based nursing among cardiovascular nurses, revealed that cardiovascular nurses have positive attitudes, feelings, beliefs, and intention of conduct towards care of patient with cardiovascular disease.

assess nurses' knowledge and attitude for patient safety in cardiac catheterization unit, revealed that



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more than three quarters of nurses had negative attitude and less than one quarter of them had positive attitude for patient safety.

This might be due to more than half of the studied nurses had good knowledge and practice acquired from training courses, protocol finding in cardiac unit, experience years of work with cardiac patient care undergoing cardiac catheterization.

concerning correlation matrix between cumulative total of knowledge, performance, and attitude in relation to cardiac catheterization procedure among the studied nurses. It clarifies that, there was a high statistically significant positive correlation between knowledge, performance, and attitude regarding cardiac catheterization procedure at ( $P=0.000$ ).

The study finding was agreed with *El Sayed et al., (2022)* who reported in thesis entitled evaluate nurses' performance regarding safety measures in cardiac catheterization unit at Benha university

hospital, reported that a high statistically significant positive correlation cumulative total knowledge, performance, and attitude regarding cardiac catheterization.

This result is in the same line with *Feroze et al (2017)* which studied knowledge and performance of registered nurses about patient safety after cardiac catheterization who found a positive correlation between the skills and knowledge regarding patient's safety following cardiac catheterization in Pakistanis registered nurses and nurses that have adequate skills and knowledge lead to patient safety.

On other hand, result for *Bakr et al., (2020)* which studied assessment of nurses 'performance regarding care of patients undergoing cardiac catheterization, stated that there was no statistically significant correlation between total nurses' knowledge, practice and attitude scores.

### Conclusion and Recommendations

#### Findings of the present study concluded that:

More than four fifth (84.7 %) of the studied nurses had satisfactory knowledge in relation to standards of care of cardiac catheterization , More than four -fifths of (83.3%) of the studied nurses had a competent practice regarding standards of care before, during

and after cardiac catheterization and more than two third (66.7%) of the studied nurses had positive level of attitude regarding standards of care of cardiac catheterization.

#### Based on the study results, the following recommendations can be given:

##### 1. At nursing personnel level:

- Training programs for nurses and nursing students about standard of care for cardiac catheterization patients in hospitals and universities.
- Continuous in-service training program need be held for critical care nurses to motivate them to achieve the standard of nursing care given to such group of patients.
- Continuous evaluation of nurses' knowledge, practice and attitude is essential to identify nurses' needs to correct the defect.

##### 2. At the organizational level:

- Encourage and help nurses to attend national and international conferences, workshops and training courses affiliated to Ministry of Health related to nursing care for patients undergoing cardiac catheterization.

##### 3. At the educational level:



- Management of patients undergoing cardiac catheterization should be included in the curriculum of all nursing sectors and institute as a minor specialty.
  - An educational program for nurses to improve the performance about standards of care for patient undergoing cardiac catheterization and assess the impact of this program.
- 4. At the research level:**
- Repeat the study on a larger sample and in different geographical areas in Egypt is recommended for generalization of findings.
  - Further studies to investigate the effects of standardized nursing care protocols on nurses' satisfaction and nursing error incidence rate.

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