

Assessment of Nurses' Knowledge and Practice Regarding Care of Patients Undergoing Percutaneous Coronary Intervention

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Abstract

Nurses play an important role in clinical stability, adequate hydration, patient comfort and psychological readiness to undergo percutaneous coronary intervention (PCI) procedure. **This study aimed to** assess nurses' knowledge and practice for patients undergoing PCI. **Subjects and method:** A descriptive research design was utilized. A convenience sample of (72) nurses who were working in the cardiology department at Assiut University-Orman Heart Hospital were included in this study. **Setting:** The study was carried out in the cardiology department at Assiut University-Orman Heart Hospital. **Tools:** Self-administered questionnaire sheet for nurses was utilized including the following parts; Part 1: " Nurses' Personal demographic data", Part 2: " Nurses' knowledge regarding PCI", Part 3: " Nurses' practice observation checklist sheet". **Results:** The majority of the study sample had unsatisfactory knowledge regarding PCI and poor practice in some items of care. **Conclusion:** The study findings revealed that the majority of the study sample had unsatisfactory knowledge and poor practice in some items of care for patients undergoing PCI. **Recommendation:** The study recommended that a designed nursing care guidelines for patients undergoing PCI must be developed.

Keywords: Nurses', Knowledge, Practice & Percutaneous Coronary Intervention.

Introduction

Percutaneous coronary intervention (PCI) is a non-surgical intervention usually performed to manage the narrowed coronary artery branches of the heart. Restoring coronary arteries blood flow to the heart muscle occurs after opening or getting rid of the plaque or stenotic segment in the coronary arteries. PCI is the preferred method of revascularization for most patients with ischemic coronary artery disease (CAD). It included balloon angioplasty, atherectomy, and stent implantation. (Sipahi et al., 2014) & (Mann et al., 2015)

In general PCI is a safe procedure, but some serious and life-threatening complications after the procedure may occur as bleeding, hematoma, pseudoaneurysm and arterial occlusion. Also, chest pain/angina, dysrhythmia and hypotension are common complications following sheath removal. These complications require nurses to use critical assessment skills, anticipate and detect any vascular problem and manage with appropriate interventions. (Burzotta et al., 2013) & (Chhatrwalla et al., 2013)

The goals of nursing care before the procedure include maintaining adequate hydration and promoting patient comfort and psychological readiness for the procedure. Nursing guidelines before the procedure included assessment of the patient's physical and psychological condition,

determining any conditions that may create procedural risk, make a baseline electrocardiograph (ECG) and take blood sample for laboratory tests. Patients should be given oral antiplatelet agents to reduce thrombotic complications during and after the procedure. Also nurse should give the patient intravenous (IV) fluids as prescribed and instruct him/her to shave the site of the procedure and fast after midnight the day before the procedure. (Gulanick & Myers, 2014)

Nursing performance during the procedure focuses on promoting the safety and comfort of the patient and working with the interventional cardiologist to ensure the successful completion of the procedure. Nurses monitor ECG and arterial pressure, noting significant changes that may accompany the administration of drugs, symptoms of ischemia or chest pain, recognize signs and symptoms of contrast sensitivity, report any changes in patient status to the physician and able to handle any situation that might arise. All patients are anticoagulated during the procedure. (Morton & Fontaine, 2018)

Nursing practice after the procedure included observing vital signs, the catheter insertion site, and evaluating peripheral circulation in the affected extremity frequently (as peripheral skin color, temperature, the presence of peripheral pulses, and capillary refill), observing and managing chest pain episodes. Also maintaining adequate periods of rest

with the affected extremity straight, administering required drugs, observing the patient's fluid intake and output and reporting any abnormal findings to the physician. (Batiha et al., 2016)

Also giving information at discharge helps patients feel more confident in the management of their health. Patients require appropriate instructions regarding catheter insertion site management, possible complications, medication instructions, diet instructions, and activity instructions during the recovery period. Also teach him about recommended lifestyle modifications, chest pain management, sexual activity instructions, scheduled follow-up and action to be taken in the event of an emergency. (Banning et al., 2015) & (Siti Maryati & Dioso, 2017)

Significance of the study

From the researcher's clinical experience it has been observed that a lot of patients undergoing PCI needed for nursing care either before or after the procedure. Therefore, this study will be helpful for health professionals especially nurses in planning and implementing care for such group of patients.

Aim of the study

This study aimed to assess nurses' knowledge and practice for patients undergoing PCI.

Research question: What is the level of nurses' knowledge and practice for patients undergoing PCI?

Subjects & Method

Research design: A descriptive research design was used.

Setting: The present study was conducted in cardiology department (inpatient cardiology ward, cardiac catheterization unit and coronary care unit) at Assiut University-Orman Heart Hospital.

Sampling and sample size: A convenience sample of (72) nurses who were working at the cardiology department {(15) work in cardiac catheterization unit and (20) work in inpatient cardiology ward and (37) work in coronary care unit} at Assiut University-Orman Heart Hospital were included in this study.

Tool: Self-administered Questionnaire Sheet for Nurses was developed for data collection after reviewing relevant literature, it included three parts.

First part included: Nurses' personal demographic data as, age, gender, marital status, level of education, years of experience and number of attendance of training courses about nursing care for patients undergoing PCI.

Second Part included: Nurses' knowledge regarding PCI including anatomy of the heart and coronary arteries, coronary artery disease (CAD), coronary artery disease risk factors, PCI procedure, nursing care guidelines before, during and after the procedure

and complications may occur and its nursing management.

Scoring system: Nurses' knowledge regarding PCI included 34 questions {(7) questions about anatomy of the heart and coronary arteries, (6) questions about PCI procedure, (6) questions about common complications may occur and its nursing management and (15) questions about nursing care before, during and after the procedure}: Scores assigned to each item were between 1 and 0 points as follow; (correct=1, incorrect=0) According to range of total scores lie between 0-34. Nurses' knowledge was classified as:

- Satisfactory knowledge $\geq 70\%$.

- Unsatisfactory knowledge $< 70\%$.

Third Part included: Nurses' practice observation checklist sheet such as nursing role before, during and after the procedure.

Scoring system: Regarding observation checklist for nurses: used a 3 point likert scale. Total items = (96) {(22) items about nursing role before the procedure, (25) items about nursing role during the procedure and (49) items about nursing role after the procedure}.

Scoring assigned to each items are between 0 and 2 points as follows (not done =0, done incorrect & incomplete =1 and done correct =2). According to total score, nurses were classified as: poor practices if the total score was $< 70\%$ and were classified as good practice was $\geq 70\%$.

Tool's validity and reliability

Tool's validity was tested through a jury of (5) experts {3 specialists in the field of medical - surgical nursing and 2 specialists in the field of cardiology medicine} from Assiut University; Their opinions were formulated as regards to the tool format layout, consistency, knowledge accuracy, relevance and competence. Tool's reliability refers to the degree of consistency with which the instrument (the questionnaire) measures the thing it is supposed to be measuring (nurses' knowledge and practice for patients undergoing PCI). Reliability of tool was confirmed by Alpha cronbach test ($R=0.95$).

A pilot study

A pilot study was carried out in August 2017 and conducted on 10% of the sample (7 nurses) to evaluate the applicability and clarity of tool was done. Based on the results of the pilot study, needed refinements and modifications were made. Nurses selected for the pilot study were not included in the main study. This pilot study was conducted two months before collection of data.

Procedure

– A review of national and international related literature in the various aspects of the problem

- using text books, articles, magazines and internet sources was done to develop the study tools.
- Official approval & administration permission was obtained from the head of the cardiology department to collect the necessary data.
 - At initial interview by the researcher to introduce her-self to initiate a line of communication in order to facilitate the implementation of the tool was done before conduction of the study.
 - Each nurse involved in the study assessed for his or her knowledge using (tool I).
 - Each nurse involved in the study assessed for his or her practice using (tool II).
 - Data were collected from the cardiology department at Assiut University-Orman Heart Hospital for 3 months, during the period from October 2017 to January 2018. The study was carried out at morning, after noon and night shifts for all available nurses.

Ethical considerations

- Research proposal were approved from Ethical Committee in the Faculty of Nursing.
- There was no risk for study subject during application of the research.

- Oral consent was obtained from patients or guidance that were participated in the study, after explaining the nature and purpose of the study.
- Confidentiality of subject data was assured.
- Study subject had the right to refuse to participate and or withdraw from the study without any rational any time.
- Study subject privacy and anonymity were considered during collection of data.

Statistical design

The statistical package for (SPSS) version (23) was used to analyze data. Descriptive statistics was used for the quantitative data in all questions and the demographic data. Descriptive statistics included: means, standard division, frequencies, percentages for knowledge and practice observational checklist of nurses were done. Pearson Chi –Square (Cross tabulation) used to compare between qualitative variables. The level of significance for this study was set at ($p \leq 0.05$) to detect any indication of differences found in the data available.

Results

Table (1): Distribution of the studied sample according to their demographic characteristics (n=72).

| Variables | N | % |
|--------------------------------|----|------|
| Age | | |
| 20 < 30 years. | 72 | 100 |
| Gender | | |
| Male. | 9 | 12.5 |
| Female. | 63 | 87.5 |
| Marital status | | |
| Single. | 35 | 48.6 |
| Married. | 37 | 51.4 |
| Level of education | | |
| Diploma. | 23 | 31.9 |
| Institute. | 45 | 62.5 |
| Bachelor. | 3 | 4.2 |
| post graduate | 1 | 1.4 |
| Years of experience | | |
| < one year. | 28 | 38.9 |
| 1-< 5 years. | 29 | 40.3 |
| 5-< 10years. | 12 | 16.7 |
| > 10 years. | 3 | 4.2 |
| Department distribution | | |
| Inpatient cardiology ward | 20 | 27.8 |
| Cardiac catheterization unit | 15 | 20.8 |
| Coronary care unit | 37 | 51.5 |
| Attained training | | |
| Yes. | 5 | 6.9 |
| No. | 67 | 93.1 |
| If yes number of attend | | |
| One time. | 4 | 5.6 |
| More than one. | 1 | 1.4 |

Table (2): Distribution of the study sample according to their total scores of knowledge. (N=72).

| Total score of nurses' knowledge | N | % |
|----------------------------------|----|------|
| Satisfactory ≥ 70 | 1 | 1.4 |
| Unsatisfactory <70 | 71 | 98.6 |

Table (3): Relation between demographic data and total nurses' knowledge.

| | Variables | Unsatisfactory <70 | | Satisfactory ≥ 70 | | P.value |
|---------------------|---------------|----------------------|------|------------------------|-----|---------|
| | | N | % | N | % | |
| Level of education | Diploma | 23 | 31.9 | 0 | 0.0 | .001** |
| | Institute | 45 | 62.5 | 0 | 0.0 | |
| | Bachelor | 2 | 2.8 | 1 | 1.4 | |
| | Post graduate | 1 | 1.4 | 0 | 0.0 | |
| Years of experience | < one year. | 27 | 37.5 | 1 | 1.4 | .661 Ns |
| | 1-< 5 years. | 29 | 40.3 | 0 | 0.0 | |
| | 5-< 10years. | 12 | 16.7 | 0 | 0.0 | |
| | > 10 years. | 3 | 4.2 | 0 | 0.0 | |
| Attained training | Yes | 5 | 6.9 | 0 | 0.0 | .931 Ns |
| | No | 66 | 91.7 | 1 | 1.4 | |

Use Pearson chi-square (cross tabs test). *=Significant difference, $*p \leq 0.05$

**= highly significance, $*p \leq 0.01$ Ns= Non significant difference

Table (4): Distribution of the study sample according to total nurses' practice before, during and after PCI procedure.

| | Done | | | | Not done | |
|--|---------|------|-----------|------|----------|------|
| | Correct | | Incorrect | | N | % |
| | N | % | N | % | | |
| Total nurses' practice before PCI procedure (n=72) | 23 | 31.9 | 4 | 5.6 | 45 | 62.5 |
| Total nurses' practice during PCI procedure (n=15) | 5 | 33.3 | 4 | 26.7 | 6 | 40.0 |
| Total nurses' practice after PCI procedure (n=57) | 10 | 17.5 | 3 | 5.3 | 44 | 77.2 |

N.B. the number of the study sample included in the evaluation of nurses' practice during PCI procedure = (15) working in cardiac catheterization unit. Also the number of the study sample after PCI procedure = (57), distributed as (n=20) working in inpatient cardiology ward and (n=37) working in coronary care unit but the nurses sample (n=15) working in cardiac catheterization unit **not included** in the evaluation of nurses' practice after PCI procedure.

Table (5): Relation between demographic data and total scores of nurses' practice.

| | Variables | Mean \pm SD | P.value |
|---------------------|--------------------|---------------------|----------|
| Level of education | Diploma | 8.9130 \pm 21.95 | 0.436 Ns |
| | Institute | 21.2889 \pm 41.01 | |
| | Bachelor | .0000 \pm .0000 | |
| | Post graduate | .0000 \pm .0000 | |
| Years of experience | Less one year | 33.6429 \pm 48.04 | 0.007** |
| | 1-less 5 years | 6.3793 \pm 19.84 | |
| | 5-less10years | 3.0000 \pm 6.68 | |
| | More than 10 years | .0000 \pm 0.000 | |
| Attained training | Yes | 2.0000 \pm 4.47 | 0.355 Ns |
| | No | 17.2090 \pm 36.28 | |

One way anova test. *=Significant difference, $*p \leq 0.05$

**= highly significance, $*p \leq 0.01$ Ns= Non significant difference.

Table (1) Showed that the majority of the studied sample were female (87.5%), their age ranged from (20 < 30) years old. Regarding marital status more than half of studied sample were married (51.4%), were having institute of nursing education (62.5%). The 72 participating studied sample distributed as (51.5%) work in coronary care unit, (27.8%) work in inpatient cardiology ward and (20.8%) work in cardiac catheterization unit. Regarding nurse's experience about (40.3%) of them their years of experience ranged from 1 to 5 years and the majority of them hadn't attended any training courses about nursing care for patient undergoing PCI (93.1%).

Table (2) Revealed that the majority of the study sample (98.6%) had unsatisfactory knowledge scores regarding PCI.

Table (3) Demonstrated that there was a highly statistical significant difference between nurses' knowledge and level of education ($p = 0.001$). Also there was no statistical significant difference between nurses' knowledge and years of experience or attending training courses.

Table (4) Showed that the majority of the study sample had poor practices regarding total nurses' practice before, during and after PCI procedure.

Table (5) Showed that there was a highly statistical significant difference between nurses' practice scores and years of experience ($p = 0.007$). Also, there was no statistically significant difference between level of education or attending training courses.

Discussion

Nurses play a critical role in the delivery of high quality care to their patients. So the competence of nurses about knowledge and practice regarding care for PCI patients was very crucial. The high nursing knowledge and practice will decrease the mortality rate and improving patients' quality of life.

Nurses' knowledge regarding PCI

The current study figured out that, the level of pre-test knowledge of the vast majority of studied sample generally was unsatisfactory. This might be related to the lack of knowledge and that most of them were not receiving any previous training and courses about PCI. This lack of knowledge may be also due to increased work load which may hinder nurses' ability to read and update their knowledge. Thus, there was a need to strengthen what nurses know and provide them with the needed knowledge necessary to improve their practice and so, patient' care.

The present study was in the line with the study conducted by **Rolley et al., (2010)**, which identified that staff nurses had knowledge deficit regarding care for patients undergoing PCI and nurses need guidelines in this area.

On the contrary, the study conducted by **Al-Ftlawy, (2014)** who revealed that nurses had a good knowledge about cardiac patient care. The present study also was disagreeing with **Abd Elkareem, (2016)** who revealed that about more than half of study group had a good knowledge about acute coronary syndrome and about most of them knowledgably about their nursing role regarding acute coronary syndrome patient.

Nurses' practice regarding PCI

The present study showed that the majority of the study sample had poor practices regarding physical and psychological patient preparation before the procedure that may increase patient anxiety and discomfort. This may be due to lack of knowledge about the procedure. This in line with **Ahmed & Gamal, (2016)** who denoted that nurses didn't explain the procedure and its purpose fully to the patient. This finding disagreed with **Antman & Sabatine, (2013)** who stressed on the importance of psychological support and good explanation of the procedure in achieving patient's cooperation and confidence and alleviating anxiety.

The present study showed that nurses had good practice in some items before, during and after PCI procedure. This could reflect nurses' familiarity with certain basic aspects of care for patients undergoing PCI despite having unsatisfactory knowledge and practice levels. Also may be relevant to nurses' practices were based on traditions. Even though the frequency of PCI procedures, there were limited data related to the nursing care guidelines of patients undergoing this procedure. This was in line with **Rolley et al., (2009)**, who conducted that there were no widely available nursing practice guidelines focusing on the managing of PCI patients.

The current study figured out that there were poor practices regarding total nurses' practice during the procedure including using principles of aseptic technique in the catheterization room. This finding disagreed with **Lewis et al., (2017)**, who stated that nurses in the catheterization room must applied principles and practices of aseptic technique that ensure and maintain a sterile field.

The current study figured out that there were poor practices regarding total nurses' practice after the procedure. This finding disagreed with **Sulzbach et al., (2010)**, who concluded that nurses should closely monitor patients who had undergone PCI post procedurally to avoid complications.

The present study figured out that there was a poor nurses' practice regarding patient discharge instructions including healthy diet, activity progression, safety tips for taking medications and follow up with physician. This study finding was disagreed with **Abd Elkareem, (2016)** who revealed

that the majority of study group had a good practice level about patient discharge instructions.

The correlations

The current study showed that there was a highly statistical significant relationship between the nurses' knowledge regarding PCI and their level of education. This study in line with **Feroze et al., (2017)**, which showed that qualification, had great effect on the nurses' knowledge. This disagreed with **Patterson, (2017)** who stated that there was no statistical significant relationship between nurses' knowledge scores and their educational level.

The current study showed that there was no statistical significant relationship between nurses' knowledge and their years of experience. This study point agreed with **Patterson, (2017)** who revealed no statistically significant relationship between nurses' knowledge scores and their years of experience.

The current study revealed that there was a highly statistical significant difference between nurses' practice scores and years of experience. This finding was not consistent with **Feroze et al., (2017)**, who revealed that there were negative correlation existed between practice and years of experience.

The current study revealed that nurses' practice level didn't differ significantly in relation to nurses' qualifications and attendance of training. This finding were in line with (**Rushdy, 2015**), who revealed that nurses' practice level didn't differ significantly in relation to nurses' qualifications and total years of experience. This also in line with **Lukose et al., (2014)** who revealed that there were no significant relation between educational qualification, years of experience, attendance any training programs and nurses' practice to care for percutaneous transluminal coronary angioplasty patients.

Conclusion

Based on the result of the present study, it can be concluded that the majority of the study sample had unsatisfactory knowledge about PCI. Also the majority of the study sample had poor practice in some items of care for patients undergoing PCI.

Recommendations

In the light of the findings of the current study the following recommendations were suggested:-

1. Developing strategies aimed to improve the quality of care before, during and after PCI procedure.
2. Studying the risk factors associated with local complications for patient undergoing PCI.
3. Evaluating the effect of using other vascular closure devices for hemostasis as (Angio-Seal closure device) after PCI on patient's outcome.

4. Periodic monitoring of the nurse's performance regarding the nursing care for patients undergoing PCI by the training team in the hospital to evaluate the level of nurses and provision of guidance to correct the poor practices.
5. A designed nursing care guidelines for patients undergoing PCI must be developed.
6. Manual of nursing procedure regarding care for patients undergoing PCI should be available on the cardiology department.
7. Study the impact of a designed nursing intervention protocol on the outcome of patients undergoing PCI.
8. Further research into nursing care of post-PCI patients is needed to close gaps in knowledge and facilitate development of standards of nursing care.

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