Effect of Clinical Nursing Practice Guidelines Regarding Percutaneous Coronary Interventions on Patients' Anxiety and Satisfaction

Ebtisam A. Ebrahim[1], Ibrahim A. Ibrahim[2], Faisal A. Alasmari[3], Awad H. Alkhatib[4], Nahlah A. Alzahrani[5], Alaa M. Abuhaleimah[6], Sanaa B. Barnawi[7], Bayan F. Jilani[8], Hadeel Y. ALhawsawi[9], Shatha M. Alsufyani[10], Amnah O. Al ahdal[11], Amr H. Qurban[12]

[1]Nursing Research and evidence-based practice Department, King Abdullah Medical City, Makkah, KSA.
e-mail: Elhihi.E@kamc.med.sa
[2]Department of nursing administration, Faculty of Nursing, Mansoura University, Mansura, Egypt.
e-mail: Dribrahim61@gmail.com
[3]Nursing Research and evidence-based practice Department, King Abdullah Medical City, Makkah, KSA.
 e-mail: Alasmari.F@kamc.med.sa
[4]Critical Care Unit, King Abdullah Medical City, Makkah, KSA.
e-mail: alKhatib.a@kamc.med.sa
[5]Department of Nursing Quality and Patient Safety, King Abdullah Medical City, Makkah, KSA.
e-mail: Alzahrani.n3@kamc.med.sa
[6]Department of Nursing Quality and Patient Safety, King Abdullah Medical City, Makkah, KSA.
e-mail: Abuhalimah.a@kamc.med.sa
[7]Department of Nursing Administration, King Abdullah Medical City, Makkah, KSA.
e-mail: Barnawi.S@kamc.med.sa
[8]Department of Nursing Quality and Patient Safety, King Abdullah Medical City, Makkah, KSA.
e-mail: Jilani.B@kamc.med.sa
[9]Department of Cardiac Surgery Ward, King Abdullah Medical City, Makkah, KSA.
e-mail: Alhawsawi.H2@kamc.med.sa
[10]Medical Department, King Abdullah Medical City, Makkah, KSA.
e-mail: Alsufyani.S@kamc.med.sa
[11]Cardiac Catheterization Department, King Abdullah Medical City, Makkah, KSA.
e-mail: Alahdal.a@kamc.med.sa
[12]Emergency Department, King Abdullah Medical City, Makkah, KSA.
e-mail: Qurban.A@kamc.med.sa

ABSTRACT

Context: The quality of healthcare delivery needs to be improved due to the quick changes in healthcare. Patient satisfaction is a key determinant of healthcare quality and demonstrates the provider's ability to meet patients' needs.

Aim: To determine the effect of clinical nursing practice guidelines regarding percutaneous coronary interventions (PCI) on patients' anxiety and satisfaction.

Methods: The current quasi-experimental (study/control design) research included a convenient sample of 106 newly admitted patients to the King Abdullah Medical City cardiac care unit divided into two groups: 53 patients for the control group and 53 patients for the intervention group. Patient satisfaction was measured by patient satisfaction with the nursing care quality questionnaire, and State-Trait Anxiety Inventory was used to assess the patients' anxiety. Online questionnaires were utilized for data collection.

Results: The result of this study reveals that the mean score of anxiety before PCI in the intervention group was 40.09±9.84 compared to the mean score of anxiety in the control group, 34.85±4.47 with a statistically significant difference between them (p=0.006). Furthermore, it was found that the mean score of anxiety after implementing clinical practice guidelines in the intervention group was found to be 26.17±6.47 compared to the mean score of anxiety after PCI in the control group of 33.70±9.24 with a highly statistically significant difference between them (p=0.000). The mean score of patients' satisfaction in the intervention group was found to be 104.21±7.24 compared with the mean score of patients' satisfaction in the control group, 85.74±16.46, with a statistically significant difference between them p=0.000.

Conclusion: Implementing clinical nursing practice guidelines decreases anxiety and enhances satisfaction among patients undergoing PCI. The study recommends a training program be implemented to enhance nurses' knowledge and skills regarding clinical nursing practice guidelines for cardiac catheterization patients.

Keywords: Anxiety, Nursing Practice guidelines, Percutaneous coronary interventions, Patients satisfaction.

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[1]Correspondence author: Ebtisam Abdellatif Ebrahim

1. Introduction

Cardiovascular disease is the leading cause of death globally *(World Health Organization, 2022)*. According to recent studies, the number of myocardial infarction deaths worldwide is estimated to be around 8 million per year, with heart failure accounting for 30% of those cases *(Yancey, 2019; Labrague et al., 2019; Korhonen et al., 2019)*. The primary clinical therapy for acute coronary syndrome patients is percutaneous coronary interventions (PCI), which have the advantages of rapid response, less surgical trauma, and speedy recovery *(De Luca et al., 2017)*. It is simple; however, various complications could arise during PCI intervention, leading to poor prognosis, such as diminished cardiac function and bleeding *(Hahn et al., 2018)*.

Some patients continued to be at risk for major complications of cardiovascular outcomes and readmission after the procedure, even though PCI significantly reduced the symptoms of chronic heart disease (CHD), decreased mortality, and improved quality of life. Several variables affect a patient's prognosis for CHD, and one of those variables is a strong psychological stress response *(Açıkel, 2019)*. Treatment in intensive care units is an important component that makes patients who undergo PCI more anxious. The procedure is a very dangerous stressor that frequently causes anxiety which is a significant psychological stress reaction before the procedure *(Gu et al., 2016)*.

The patient's anxiety may worsen for various reasons, including being in an unfamiliar setting, immobile, continuing health risks, and being separated from friends and family. According to a study by *Zhou et al. (2019)*, anxiety was present in 37.6% of the 250 CHD patients with PCI. Anxiety can raise sympathetic excitability, catecholamine levels, and procoagulant chemicals. These changes increase heart rate and either cause or contribute to cardiovascular events like angina and myocardial infarction *(Zhang et al., 2022)*.

Anxiety manifests itself at various points before and after PCI. Anxiety and CHD are related as causes and effects, and anxiety is more likely to influence CHD patients and has a negative impact on their prognosis *(Celano et al., 2015; De Hert et al., 2018)*. Therefore, it is crucial to spot and help anxious people and determine the best strategy to treat patients' anxiety *(de Jager et al., 2018)*.

The effectiveness of any healthcare facility is largely determined by patient satisfaction *(Karaca & Durna, 2019)*. Patients seek a cure for their problems when they visit medical facilities. Such patients desire a clear diagnosis of their condition, precise treatment, and quick recovery *(Shinde & Kapurkar, 2014)*. Patient satisfaction is the degree to which there is a resemblance between the expected quality of care and the received care. Healthcare organizations must prioritize patient satisfaction with nursing care because nurses make up most healthcare professionals *(Aiken et al., 2002)*.

Patients' satisfaction measurements give all the essential information on each healthcare provider's performance, which ultimately helps the quality management, planning, and assessment in the healthcare system in any country *(Alsaqri, 2016; Goh et al., 2016)*. Satisfied patients are more likely to adhere to the recommended treatment plans, which favorably impact their health *(Buchanan et al., 2015)*.

In the past few decades, great changes have taken place in the nursing discipline, including the progressive development of patient-centered holistic nursing, the adoption of comprehensive nursing quality, and the provision of patients with the best quality of service *(Duan et al., 2018)*. Clinical practice guidelines are statements systematically developed to support healthcare providers' and patients' decisions regarding the best medical treatment for certain clinical conditions. Well-written guidelines improve quality by decreasing variability in healthcare, enhancing diagnostic precision, encouraging effective therapy, and avoiding potentially dangerous or inefficient procedures *(Kredo et al., 2016)*.

Clinical practice guidelines are carefully constructed statements with recommendations for clinical practice based on systematic evaluations of the evidence and assessing their benefits and risks. They should be regularly incorporated into evidence-based practice. Evidence-based practice guidelines are crucial instruments that can reduce healthcare variation and enhance patient outcomes *(Melnyk & Fineout, 2014)*.

2. Significance of the study

According to the latest *WHO* data published in *2022*, coronary heart disease deaths in Saudi Arabia reached 39,037 or 29.13% of total deaths, and it was reported by *Alhabib et al. (2019)* that 42% of ST segment elevation myocardial infarction (STEMI) patients underwent primary PCI. It is essential to base practice on high-level evidence to improve the care given to individuals undergoing percutaneous coronary intervention. Nurses should be prepared to care for caring patients before, during, and after the PCI, closely monitor the patients' physiological indexes, communicate with the attending physicians, and promote patients' rehabilitation. So, the implementation of clinical practice guidelines is crucial to improve the care given to the patient and enhance patient outcomes and satisfaction.

3. Aim of the study

To determine the effect of clinical nursing practice guidelines regarding PCI on the patient's anxiety and satisfaction.

3.1. Research Hypothesis

The current study hypothesized that implementing clinical nursing practice guidelines regarding PCI will positively affect patients' anxiety and satisfaction among intervention group patients compared to the controls.

4. Subjects & Methods

4.1. Research Design

Quasi-experimental (study/control group) research design was used to achieve the aim of this study. It is a research design used to find a cause-and-effect relationship

between an independent and dependent variable *(Thomas, 2020).* The independent variable is clinical nursing practice guidelines, and the dependent variables are patients' anxiety and satisfaction.

4.2. Study setting

This study was carried out at the cardiac care unit, day care unit, cardiac ward, and cardiac surgery ward at King Abdullah Medical City, Holy Makkah (KAMC). The KAMC was established in 2008 with a 390-bed capacity. It specializes in four core medical areas: Oncology, cardiology, neuroscience, and specialized surgeries. KAMC has critical care units and medical-surgical units. It has specialized centers such as endoscopy, ophthalmology, and diabetes centers.

4.3. Subjects

A convenience sample of 106 newly admitted patients was included in this study. These patients were divided into two groups, 53 patients each. The control group had PCI based on the routine care applied by nursing staff, and the intervention group had PCI based on the guidelines applied by the researchers. The patients undergoing PCI were conscious. Patients with hearing or visual impairment and a history of the previous PCI were excluded.

The sample size was determined using MedCalc Software with considering Type I error (0.05), Type II error (0.10), a difference of means (6.55), standard deviation in group 1 (study group) (10.07), the standard deviation in group 2 (control group) (10.48), a ratio of sample size in group 1/ group 2 = 1. So, the sample size was 53 for each group.

4.4. Tools of data collection

Data were collected through two online questionnaires.

4.4.1. State-Trait Anxiety Inventory

The first questionnaire includes two parts. Part 1 included patient demographic data such as age, level of education, gender, marital status, and admission number. Part 2 included the State-Trait Anxiety Inventory adopted from *Spielberger et al. (1983)* to assess patients' anxiety before and after PCI. It consists of 21 items. The patient was asked how much he/she has been bothered by the symptoms, such as numbness, feeling hot, wobbliness in his legs, inability to relax, dizziness, and fear of the worst.
Scoring system

The items were rated on four points Likert scale. The score of each item was allotted as not at all was scored as one, mildly, but it did not bother me much as two, moderately - it was not pleasant at times was scored as three and severely- it bothered me a lot was scored as four. The data were presented at a total mean score of anxiety.

4.4.2. Patients' Satisfaction with Nursing Care Quality Questionnaire

The second questionnaire assessed patients' satisfaction with nursing care quality after PCI. The researcher adopted this part from *Laschinger (2005).* It consists of 19 items

about the satisfaction of information given to the patients, family, and friends involved in the care, nurses' attention to patients' condition, nursing staff response to patients' calls, and care coordination. Moreover, three additional questions were designed to measure satisfaction with the overall quality of care during the hospital stay.
Scoring system

Each item had five responses ranging from 1-5 as the following: (1) poor, (2) fair, (3) good, (4) very good, and (5) Excellent. The total mean score of satisfaction was presented as a mean score.

4.5. Procedures

The tools were translated from English to Arabic for Arabic speaker patients. The reliability was tested for the two questionnaires, the State-Trait Anxiety Inventory and patients' satisfaction with nursing care quality questionnaire, using Cronbach's coefficient alpha. The results were acceptable r=0.86 and 0.92, respectively. Content validity was done by three experts at Research Center at King Abdullah Medical City.

Ethical approval was obtained from KAMC IRB registered at the National BioMedical Ethics Committee, King Abdulaziz City for Science and Technology, with approval number 20-737, and the study was done accordingly.

An official e-mail was sent to the nursing administration office for approval to collect the data clarifying the purpose of the study. After approval, the researcher explained the study to the participants and took verbal consent if they wanted to participate. Participation was voluntary and anonymous.

For the control group, after the patient's admission, the researchers responsible for data collection interviewed the patients, explained the aim of the study, and took verbal approval for participation. Then anxiety was assessed using the State-Trait Anxiety Inventory through an online questionnaire by sending the link to the patients' phones. The control group received routine care PCI at the cardiac care unit. Before discharge, the researcher went again for the patients and sent satisfaction and anxiety self-administered online questionnaires to patients' phones.

For the intervention group, anxiety was assessed after admission using the State-Trait Anxiety Inventory online questionnaire because of infection control restrictions due to COVID-19. Then, clinical nursing practice guidelines regarding PCI that was adopted from *Rolley et al. (2011)* were implemented on the patients. These guidelines were implemented as the following: pre-procedural nursing practice steps that included recommendations that were implemented by the research team for pre-procedural orientation: in the case of emergency, strategies was implemented to decrease 'door-to-balloon time and for elective procedures provide clinicians more time to explore the concerns and knowledge gaps of the patient and their family as PCI procedures, pathway, key contact details for the hospital, visiting policies and potential discharge date. A full assessment was conducted upon admission including baseline observations, height, weight, ECG, health history,

allergies, history of IV contrast use/allergy, history of PCI procedures and vascular observations (baseline).

Also, it Included management of biological, psychological, and social risk factor, screening for the factors that placing patients at increased risk of complications including: Diabetes, Angiotensin Converting Enzyme Inhibitor (ACEI) use, renal insufficiency, vascular disease, untreated infection, hematological disorders, obesity, electrolyte imbalance, and uncontrolled hypertension, fasting for at least eight hours, fluids (Intravenous fluids was administered prior to commencing the procedure and continued until the patient was able to freely consume fluids). Administration of IV fluids depend on co-morbid conditions, managing risk for renal impairment. Metformin was discontinued prior to the procedure and not recommended until 48 hr. following the procedure to avoid nephrotoxicity due to interaction with the intravenous contrast also following sheath removal, oral fluids were encouraged to aid renal clearance and medication consideration, critical pathway (the hospital have a critical pathway with specific elevator and line at the floor to be followed for all critical and emergency cases), planning for discharge and discharge medications.

Peri-procedural nursing practice included assessment, monitoring, and pain management recommendations. Post-PCI nursing practice steps included recommendations about vital signs observation, arterial access site monitoring, limb circulation observation, coagulation, assessing renal functions, potential puncture site complications, and sheath-removal pain management.

Post-PCI secondary prevention practice recommendations included patient access site care education, patient positioning and sheath removal ambulation times, prevention strategies of potential puncture site complications through regular observations of the access site, surrounding tissue, and limb to detect potential complications which including hematoma, retroperitoneal bleeding, and compromised limb circulation. Initial observations should be conducted no less than every 15 minutes for the first hour and then every 30 minutes until sheath removal or ambulation in the case of an operator-inserted closure device. Procedural information was explained through audio-visual, pamphlets, and verbal education. Satisfaction and anxiety online questionnaires were sent to the patient's phone before discharge.

4.6 Data analysis

The collected data were organized, tabulated, and analyzed using SPSS version 21. Frequency and percentage were used to express the categorical variables, and the continuous variables were represented as mean and standard deviation. The means of two unrelated groups on the same parametric continuous variable were compared using an independent t-test. Mann-Whitney test was used to compare the means between two unrelated groups on the same non-parametric continuous variable.

For comparing the means between more than two unrelated groups on the same parametric continuous variable

ANOVA test was used. Paired t-test test was utilized to test differences of parametric continuous variables between related groups. Wilcoxon signed ranks test used to test differences of non-parametric continuous variables between related groups. Pearson correlation coefficient test, was conducted to test the association between two continuous variables. Statistical significance was considered at p-value ≤ 0.05 and 0.01.

5. Results

Table 1 compares the intervention and control groups concerning the demographic data at the beginning of the study. It was found that 73.5% of the patients in the intervention group and 69.8% in the control group were equal to or more than fifty years old. Furthermore, it was found that 17.0% of patients in the intervention group and 34.0% of the patients in the control group were highly educated.

It was also noted that 69.8% of patients in the intervention group were males, while they were 84.9% in the control group. Most patients were married (98.1% and 94.3% for intervention and control groups, respectively), with no statistically significant difference between them regarding all the demographic parameters.

Table 2 compares the study and control group's total anxiety scores pre and post-intervention. A statistically significant difference in total anxiety score before and after (pre/post-intervention) implementing clinical nursing practice guidelines was revealed among the intervention group (p=0.000). However, there was no statistically significant difference in the total anxiety score of the control group (pre/post-intervention) at (p=0.65).

Table 3 illustrates the comparison of the study and control group regarding total anxiety score before and after the intervention, that the mean score of anxiety before implementing clinical nursing practice guidelines in the intervention group was found to be 40.09±9.84 compared to the mean score of anxiety before PCI in the control group 34.85±4.47 with a statistically significant difference between them (p=0.006). Furthermore, it was found that the mean score of anxiety after implementing clinical nursing practice guidelines in the intervention group was found to be 26.17±6.47 compared to the mean score of anxiety after PCI in the control group of 33.70±9.24 with a highly statistically significant difference between them (p=0.000).

Table 4 demonstrates a statistically significant difference between the intervention and control groups regarding patients' satisfaction after PCI (p=0.000).

Table 5 reveals no statistically significant relationship between anxiety and patients' satisfaction after PCI in both groups.

Table 6 illustrates no statistically significant relationship between patients' satisfaction and their demographic characteristics in both groups.

Table (1): Comparison of intervention and control groups' demographic characteristics (n=106).

Demographic characteristics	Intervention group (n=53)		Control group (n=53)		χ^2	p-value
	n	%	n	%		
Age						
26-<35	1	1.8	4	7.5	1.89	0.39
35-<50	13	24.5	12	22.6		
≥50	39	73.5	37	69.8		
Education						
Illiterate	8	15.1	6	11.3		
Primary school	11	20.8	11	20.8	4.42	0.22
high school	25	47.2	18	34.0		
high education	9	17.0	18	34.0		
Gender						
Male	37	69.8	45	84.9	3.44	0.06
Female	16	30.2	8	15.1		
Marital status						
Unmarried	1	1.9	3	5.7	1.04	0.41
Married	52	98.1	50	94.3		

Table (2): Comparison of patients' total anxiety score before and after clinical practice guidelines in intervention and control group (n=106).

The studied groups	Total anxiety score		Z test	p-value
	Before intervention (before PCI)	After intervention (after PCI)		
	Mean±SD	Mean±SD		
Intervention group	40.09±9.84	26.17±6.47	6.09	0.000
Control group	34.85±4.47	33.70±9.24	0.46	0.65

Table (3): Comparison of intervention and control groups' anxiety before and after clinical practice guidelines (n=106).

The study phases	Group		Z test	p-value
	Intervention group	Control group		
	Mean±SD	Mean±SD		
Before intervention (PCI)	40.09±9.84	34.85±4.47	2.74	0.006
After intervention (PCI)	26.17±6.47	33.70±9.24	4.79	0.000

Table 4: Comparison between the intervention and control groups' satisfaction after clinical practice guidelines (n=106).

Variable	Intervention group	Control group	t-test	p-value
	Mean±SD	Mean±SD		
Patients' satisfaction	104.21±7.24	85.74±16.46	7.47	0.000

Table (5): Relationship between anxiety and patients' satisfaction after clinical practice guidelines implementation (n=106).

Variable	Intervention group (n=53)		Control group (n=53)	
	Anxiety		Anxiety	
	r	p	r	p
Patients' satisfaction	0.09	0.48	0.05	0.73

Table (6): Patients' satisfaction differences with patients' demographic characteristics.

Demographic characteristics		Patients' satisfaction	
		Study group (n=53)	Control group (n=53)
		Mean±SD	Mean±SD
Age			
26-<35		100.00*	85.50±14.11
35-<50		106.54±4.79	88.58±14.51
≥50		103.54±7.86	84.84±17.51
	f/p-value	1.00/0.37	0.23/0.80
Education			
Illiterate		99.25±11.20	87.67±7.58
Primary school		106.09±6.02	84.45±16.98
high school		105.60±6.11	80.22±17.42
high education		102.44±5.89	91.39±16.44
	f/p-value	2.22/0.11	1.46/0.23
Gender			
Male		104.08±6.36	85.33±16.97
Female		104.50±9.22	88.00±13.98
	t/p-value	0.19/0.85	0.42/0.68
Marital status			
Unmarried		110.00*	101.67±14.43
Married		104.09±7.27	84.78±16.20
	t/p-value	0.80/0.43	1.76 /0.8

N=1, so no standard deviation

6. Discussion

Most basic healthcare services in hospitals are provided by nurses, who play a crucial role in the healthcare system by spending more time with patients. So, to determine the total satisfaction with the hospital service provided, it is crucial to measure the level of patient satisfaction with nursing care *(Darega et al., 2016)*. This study aimed to determine the effect of clinical nursing practice guidelines regarding PCI on the patient's anxiety and satisfaction.

Stress and anxiety prolong the adaptation period, negatively impact patients' quality of life, and delay their return to social activities and occupation *(Sharif et al., 2014)*. *Rouhi et al. (2016)* reported that most coronary angioplasty patients suffered from clinical anxiety. The present study findings demonstrate a highly statistically significant difference between anxiety before and after implementing clinical nursing practice guidelines-in the intervention group and between both groups. This finding may be due to information that was explained through audio-visual, pamphlets, and verbal education, effective communication with patients, and implementation of practice guidelines that decreased the patient's anxiety. This result is in line with *Zhao et al. (2008)*. They reported a significant correlation between anxiety levels before and after PCI, highlighting the need for a suitable strategy and health education program offered by doctors, nurses, and cardiac technicians.

Results of this study reveal that implementation of clinical nursing practice guidelines regarding PCI increase patients' satisfaction compared to the controls, with a statistically significant difference between both groups after intervention. This finding is due to the improvement of care given to the intervention group patients through the systematic implementation of guidelines in the perioperative period of PCI. These findings support the research hypothesis.

This result is in line with *Zhang et al. (2020)*. They stated that using clinical nursing practice guidelines in PCI can improve nursing care quality compared to traditional nursing practices. This result includes significantly reducing the time from door to balloon, the length of stay at the hospital, the overall cost of hospitalization, postoperative complications, and increased patient satisfaction. A contradiction was also reported by *Mensa et al. (2017)* that total adult patient satisfaction with nursing service in the hospital was very low.

The current study reveals no statistically significant relationship between patient demographics and satisfaction. This finding may be attributed to the small sample size recruited in the current study. These findings are matched with *Alsaqri (2016),* who reported that no relationships were discovered between gender and patient satisfaction levels. *Shinde and Kapurkar (2014)* stated no association between education level and patient satisfaction. In contrast, *Karaca and Durna (2019)* found that patients aged 56 years or older were less satisfied than other age groups. *Shinde and Kapurkar (2014)* reported that older respondents reported higher satisfaction levels.

7. Conclusion

The current study findings indicated that implementing clinical nursing practice guidelines regarding PCI decreases patients' anxiety and increases satisfaction, which supports the research hypothesis. Moreover, there was no relationship between demographic data and patient satisfaction.

8. Recommendations

Training programs should be implemented to enhance nurses' knowledge and skills regarding clinical nursing practice guidelines for cardiac catheterization patients. Clinical practice guidelines should be updated and tailored to

patients' needs. Encourage the nurses' attendance for workshops and conferences concerning the updating guidelines. Nurses should pay attention to symptoms of anxiety to handle and care for these patients. Patients' satisfaction should be considered one of the important outcomes of nursing intervention. Furthermore, replicate this study on a larger sample for generalization.

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