

Impact of an Educational Intervention on Nurses' Practices for Ensuring Patient Safety During Coronary Angiography

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ABSTRACT

Background: Nurses play a critical role in ensuring the safety of patients undergoing coronary angiography. Prioritizing patient safety within coronary care unit guidelines is essential to minimize complications and ensure the delivery of effective, high-quality medical care. **Methods:** A quasi-experimental study was conducted from June 4, 2023, to December 27, 2023, at the Al-Nasiriyah Heart Center's cardiac medical department. A total of 50 nurses were divided into two groups: a study group (n=25) that participated in a nursing interventional program and a control group (n=25) that did not. The study instrument comprised two sections: (1) a sociodemographic questionnaire with six items and (2) an observational checklist with 36 items assessing nurses' safety practices during coronary angiography. Instrument validity was established through expert review, and internal consistency was verified in a pilot study. **Results:** The interventional program significantly improved the nursing practices of the study group, as evidenced by a substantial post-test difference ($p = 0.001$). Additionally, a significant improvement in post-test practices was observed in the control group ($p = 0.022$), though less pronounced compared to the study group. **Conclusion:** The nursing interventional program demonstrated a positive impact on improving nurses' safety practices during coronary angiography. Future studies are recommended to explore the effectiveness of similar programs with larger sample sizes and diverse settings to further validate these findings.

Keywords: Coronary Angiography, Nurses, Practices, Safety of Patient

INTRODUCTION

Coronary artery disease (CAD) is commonly referred to as heart disease (HD) or coronary heart disease (CHD) [1]. CAD is the most common type of cardiovascular disease (CVD) Globally, coronary artery disease (CAD) is the leading cause of death [2]. It is mostly brought on by atherosclerosis, which is the buildup of fatty materials on artery walls that causes the walls to become harder [3]. Atherosclerosis is a systemic disease that frequently impacts several arteries in one individual [4]. Coronary angiography, also known as C.A., is one of the most widely used and successful techniques for identifying coronary artery diseases. It requires a broad range and has temporary benefits. Cardiologists can now perform coronary angiography as a diagnostic and interventional treatment. Determining the morphological features and functional state of coronary artery disease is beneficial. Both minor and major complications from this invasive procedure may result in increased morbidity and mortality. The cardiac catheterization team is responsible for ensuring that patients receive high-quality care. Ensure that they are safe from inadvertent injury while obtaining medical attention [5]. The most significant vascular complications include retroperitoneal hematoma, loss of distal pulse, and arterial perforation. Minor vascular complications include infections, hematomas, AV fistulas, and pseudo-aneurysms [6]. Nurses' practices are crucial when it comes to this invasive procedure since they help lower the danger and prevent complications [7]. Globally, patient safety is growing more and more significant, and improving patient safety has recently attracted national attention [8]. Cardiac nurses are responsible for ensuring patient safety and preventing vascular problems during cardiac catheterization operations. They should be attentive of and aware of the rules that ensure patient safety. Every nurse should be familiar with maintaining homeostasis and safe handling practices for high-risk patients [9]. Nurses give three phases of nursing care to patients who have undergone coronary

angiography: pre-, intra-, and post-coronary angiography [10]. Nurses must educate their patients in order to manage patients undergoing CA and to reduce complications. They must therefore have the required abilities and knowledge. In order to avoid difficulties, encourage a speedy and easy recovery, and reduce hospital stays, nurses must get standardized instruction [11].

MATERIALS AND METHODS

Design

A quasi-experimental study (pre-posttest) with a quantitative research design was carried out at Al-Nasiriyah Heart Center from June 4 to December 27, 2023, to assess the effect of an interventional program on nurses' practices regarding patient safety during coronary angiography.

Setting and Sample

The study was carried out at the cardiac care unit (CCU) and cardiac medical ward of the Al- Nasiriyah Heart Center located in the Thi-Qar Governorate of Iraq. The period of data collection is June 4, 2023, to December 27, 2023. There were fifty nurses from the cardiac care unit and heart medical ward that made up the purposive sample (nonprobability). The sample was divided into two groups of twenty-five nurses in each: the study group underwent a researcher-led intervention program, while the control group received no intervention.

Intervention

A review of pertinent scientific papers and the researchers' own experiences served as the foundation for the development of the nursing interventional program. The purpose of the training was to teach nurses the standard procedures for ensuring patient safety

during coronary angiography. The study sample was divided into two groups based to workload, and an interventional program was created and delivered in three sessions. The study sample also received one week of training specifically for them. The sessions were translated into Arabic because Arabic is the sample language. Every session lasted roughly sixty minutes.

Data Collection

The instrument collected data that was based on a review of the literature and comprised two main components. Using a particular sheet that had six categories—age, gender, marital status, education level, years of experience, and workplace. The first section focused on evaluating the socio-demographic traits of these nurses. Nurses provided their demographic data. The second component consisted of a study checklist instrument that was divided into two parts, pre- and post-coronary angiography. The checklist had 36 items concerning the practice of nurses for patient safety during coronary angiography. A checklist tool was used to gather the data. When providing nursing care to patients undergoing coronary angiography, nurses were under supervision by researcher in medical wards and the critical care unit. Observations were made on the scale levels of the respondents, and their practices were recorded as the mean of data collection, with 1 representing apply and 0 representing not apply.

Data Analysis

In order to evaluate the internal consistency between the items, the Cronbach's alpha coefficient was calculated using IBM SPSS version 26.0 on a randomly selected sample of five individuals. A reliability investigation of the practices scale yielded an outstanding result of 0.903, indicating that the instrument's equivalence measurability and internal consistency were satisfactory.

Analysis of the main sample data was conducted using the statistical analysis software SPSS version 26. In order to determine whether the difference is statistically significant and to investigate the relationship between the research variables, the study used both descriptive and inferential statistical data analysis techniques. Examples of the latter include the t-test and bivariate correlation, while the former involves the use of frequencies and percentages, mean, and standard deviation. Next, it was necessary to utilize inferential data analysis was employed to determine if the statistical hypotheses were accepted or rejected.

Ethical Consideration

Through the University of Baghdad's College of Nursing, an official request was made. The Central Statistical Organization (CSO) in Iraq has received a detailed description from the researcher, together with copies of the questionnaire and protocol, to aid in the sample collection process. The researcher provided the Thi-Qar Health Office with a thorough justification that outlined the goals of the study in order to obtain official authority to perform the study. The head of the Al-Nassiriyah Heart Center in the city of Al-Nassiriyah gave permission for the interventional program to be performed on a sample of nurses working for the medical department, which comprises the wards and the critical care unit. March 12, 2023, the Scientific Research Ethical Committee at the University of Baghdad's College of Nursing granted the study ethical approval under number (2). The investigators were informed that all collected data would be treated with the utmost confidentiality and used exclusively for the objectives of the study.

Results

Table 1 shows that the majority of the sample was between the ages of 22 and 25 (52%), and the majority of them were married (72%). This indicates the demographic characteristic of the nurses' practices. In terms of education, the majority of them held a bachelor's degree (52%). Of those with nursing experience, 76% had between one and five years of experience, and 60% worked in a cardiac ward. As demonstrated by Table 2 overall evaluation of nurses' practices, the study group's nurses had poor pretest (60%, $M \pm SD = 37.36 \pm 9.433$) and good posttest (92%, $M \pm SD = 88.64 \pm 9.393$) levels of practice, respectively, demonstrating a marked differences in their standard of practice.

In the pre-test period (between 60% and 40%), the study group's nurses exhibit low to medium levels of practice; in the post-test period, however, a large percentage of nurses (92%) demonstrate good levels of practice. According to Figure 1, the control group's practices were bad (72%), fair (88%), and neither during the pre-test nor post-test periods. Table 3 shows a substantial difference at the post-test level ($p\text{-value} = 0.001$), suggesting that the study group's nurses' practices were significantly impacted by the interventional program. The way that nurses in the control group manage post-test time varies significantly from person to person ($p\text{-value} = .022$).

Table 1: (A) Distribution of Nurses' Socio-Demographic Characteristics

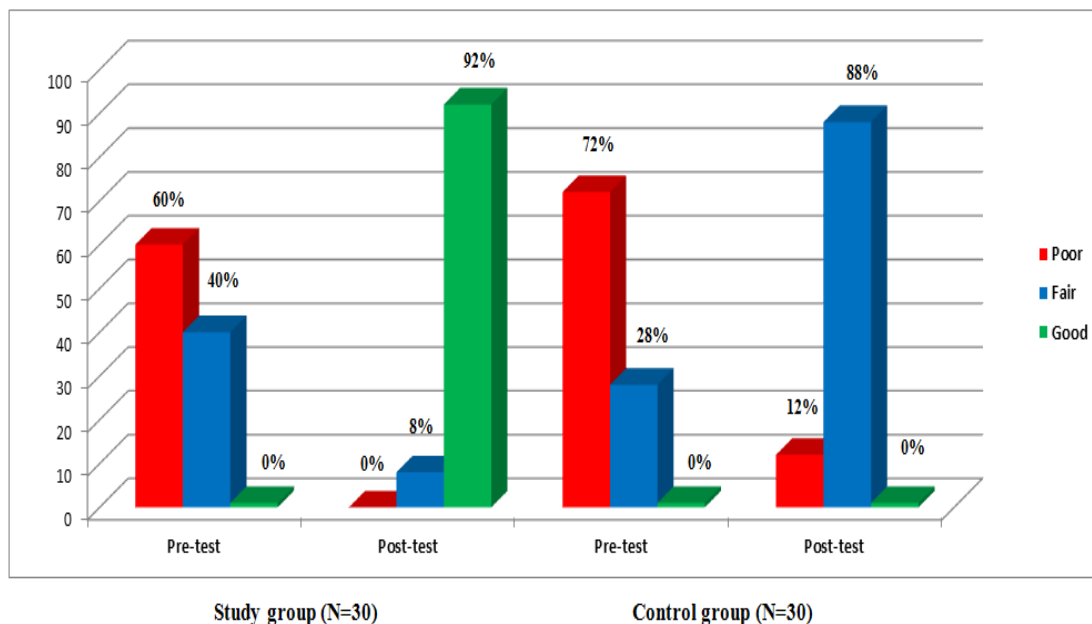
No.	Characteristics		Study Group		Control Group	
			F	%	F	%
1	Age (Years)	22 – 25	13	52	9	36
		26 - 29	7	28	8	32
		30 - 33	4	16	2	4
		34 – 37	0	0	2	4
		38 and older	1	4	4	16
		Total	25	100	25	100
		$M \pm SD$	27.08 ± 3.9		29.36 ± 5.8	
2	Sex	Male	7	28	9	36
		Female	18	72	16	64
		Total	25	100	25	100
3	Marital Status	Unmarried	7	28	10	40
		Married	18	72	15	60
		Total	25	100	25	100

Table 1 (b): Distribution of Nurses' Socio-Demographic Characteristics

No.	Characteristics		Study Group		Control Group	
			F	%	F	%
4	Level of Education	Nursing school	4	16	7	28
		Diploma	8	32	11	44
		Bachelor	13	52	7	28
		Total	25	100	25	100
5	Years of Experience	1-5	19	76	12	48
		6-10	4	16	4	16
		11 or more	2	8	9	36
		Total	25	100	25	100
		M±SD	4.76 ± 3.6	8.36 ± 6.1		
6	Workplace	CCU	10	40	13	52
		Cardiac ward	15	60	12	48
		Total	25	100	25	100

Table 2: Assessment the Study and control groups nurses' Practices

Levels of Practices	Study Group (N= 25)								Control Group (N= 25)							
	Pre-Test				Post-Test				Pre-Test				Post-Test			
	F	%	M	SD	F	%	M	SD	F	%	M	SD	F	%	M	SD
Poor	15	60	37.36	9.433	0	0	88.64	9.393	18	72	38.32	9.286	3	12	45.40	9.238
Fair	10	40			2	8			7	28			22	88		
Good	0	0			23	92			0	0			0	0		
Total	25	100			25	100			25	100			25	100		

**Figure 1 :** Evaluation the Study and Control Groups Nurses' Practices**Table 3:** Comparison the effect of interventional program on practices of nurses (study and control groups)

Practices	Study Group (N=25)						Control Group (N=25)					
	M.	SD	T	Df	P-Value	Sig.	M.	SD	T	Df	P-Value	Sig.
Pre-Test	37.36	1.887	17.837	24	.001	H. S	38.32	9.286	3.508	24	.022	S
Post-Test	88.64	1.880					45.40	9.238				

Discussion

One of the main issues facing public health worldwide is patient safety. Sometimes when mistakes are made when giving medical treatment to patients, there can be grave consequences, such death, disability, or the need for more acute care [12]. Coronary angiography is a widely used interventional technique that is beneficial in the diagnosis of individuals with acute coronary syndrome (ACS) [13]. It

may produce a number of health problems that need to be looked into and treated after the procedure. Taking into account potentially dangerous outcomes in order for the nurse to play a crucial role in improving patient safety and delivering top-notch nursing care in the coronary angiography unit [14]. A quasi-experimental study was conducted at the Al-Nasiriyah Heart Center to assess how an interventional program affected the protocols that nurses followed to ensure patient safety during coronary angiography [15]. In terms of

sociodemographic features of nurses, the majority of participants were between the ages of 22 and 25. This result is consistent with study in 2021 by Skal and Ahmed, who observed that the majority of the sample was between the ages of 22 and 25 [16]. Based on gender and marital status, the current study discovered that over half of the nurses were married and female. This result is in line with that of Abdulrdha and Mansour, who discovered that married women made up the majority of the study nurses [17]. Most nurses had one to five years of experience. Dawood & Hassan found that most of the employees had less than five years of experience, which supports this finding [18]. Most of them are nursing bachelor's degree holders. The results are consistent with Baiez & Mohammad, [19] (Table 1). The overall evaluation of nursing practices shows that there was little practice done before the test. This result is consistent with the findings of Elawhabe et al., [20] who discovered that the level of practice of all the nurses under study was inadequate for caring for patients having cardiac catheterization [21].

Research Hypothesis

1. Significant differences concerning the increase of practice in posttest for nurse in the study group than those of pretest. 2. No Significant differences concerning the increase of practice in posttest for nurse in the study group than those of pretest. The findings of the current study validated hypotheses 1 and demonstrated that the

nursing interventional program had a favorable impact on nurses' practices regarding patient safety during coronary angiography, as revealed in posttest practices. These findings were consistent with a study conducted in Egypt, which found that a patient safety educational program improved nurses' knowledge and performance for patients having cardiac catheterization.

Conclusion

Based on the findings of the present study indicates that the interventional program had a favorable influence in improving practices of nurse concerning patient safety during coronary angiography

Recommendation

The researcher recommends doing similar research on bigger samples in the future. It is necessary to set up ongoing nursing education and training programs for recently graduated nurses on patient safety during coronary angiography.

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