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Evaluation of Nurses pre-post practices in the care of patients undergoing angioplasty at Azadi Teaching Hospital

[1]Brwa Sherzad Marf and [2]Rebaz Ismael Ali

[1] Kirkuk Health Directorate, Kirkuk, Iraq
[2] Department of Adult Nursing, College of Nursing, University of Kirkuk, Kirkuk, Iraq

Corresponding Author: Rebaz Ismael Ali

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Abstract

Background: Nurses play an important role in clinical stability, adequate hydration, patient comfort and psychological readiness to undergo percutaneous coronary intervention (PCI) procedure. Percutaneous coronary intervention (PCI) is a nonsurgical 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.

Objective: To assess the practices of nurses in the care of patients undergoing angioplasty. to evaluate the practical competencies of nurses in providing pre-procedural and post-procedural care to patients undergoing angioplasty.

Methodology: A cross-sectional, descriptive study. The study Conducted at Azadi Teaching Hospital's Cardiology Department in Kirkuk, the setting was chosen as a key referral center for percutaneous coronary interventions between the period 20th November 2024 to 1st June 2025. (60) nurses were working in the Cardiology Department participate for the study as sampling method

Results: The result shows nurses' pre- and post-procedural practices in angioplasty care using a 3-Likert scale across 44 items. Pre-procedural practices showed high adherence in 55% of items, moderate in 25%, and low in 20%, highlighting strengths in vital signs monitoring but deficiencies in patient education. Post-procedural practices were rated high in 45.83% of items, moderate in 33.33%, and low in 20.83%, with strong adherence to wound care but gaps in renal complication monitoring. The overall assessment indicated moderate-to-high competency, emphasizing the need for structured training programs to ensure consistency in nursing practices and improve angioplasty patient outcomes.

Conclusions: The findings reveal strong adherence to critical safety measures in both pre- and post-procedural angioplasty care, but significant gaps remain in patient education and preparation. While nurses demonstrated proficiency in monitoring vital signs and ensuring proper wound care, inconsistencies in educating patients on fasting guidelines, hydration, and follow-up care were observed. Structured training programs and standardized protocols could bridge these gaps, enhancing overall nursing competencies. The moderate-to-high practice levels indicate a solid foundation, but targeted interventions are necessary to optimize patient care. Continuous professional development and simulation-based training can further strengthen nurses' expertise in angioplasty management.

Keywords: Nurses practices, pre-post care, patient care, coronary intervention

Introduction

A non-surgical procedure called percutaneous coronary intervention (PCI) is typically used to treat the heart's constricted coronary artery branches. Coronary artery restoration once the plaque or stenotic section in the coronary arteries has been opened or removed, blood flow to the heart muscle begins. For the majority of patients suffering from ischemic coronary artery disease (CAD), PCI is the recommended revascularization technique. (Mohammed, H. A *et al.*, 2016) [14].

It involved stent placement, atherectomy, and balloon angioplasty. 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. (Chen *et al.*, 2025), (Baeez & Younis, 2019) [2, 15].

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. (Tran &

Dear, 2025) (Mahmood *et al.*, 2018) [13, 17].

The primary goals of nursing care during the procedure are to support the patient's comfort and safety and collaborate with the interventional cardiologist to guarantee the treatment's successful conclusion. (Baeez, *et al.*, 2019) [15].

Nurses keep an eye on arterial pressure and ECG, record any notable changes that may occur during medication administration, identify signs of ischemia or chest pain, identify symptoms of contrast sensitivity, notify the doctor of any changes in the patient's condition, and are prepared to handle any emergency that may come up. Throughout the procedure, all patients are given anticoagulants. Following the procedure, nursing care involved monitoring the patient's vital signs, the location of the catheter insertion, and assessing peripheral circulation. Monitoring and treating episodes of chest pain, as well as regularly checking the extremities (such as peripheral skin color. (Iftikhar & Baig, 2025) [7] Temperature, the presence of peripheral pulses, and capillary refill). Additionally, giving the patient the necessary medications, monitoring their hydration intake and output, keeping the afflicted extremity straight for appropriate rest intervals, and informing the doctor of any abnormalities. Additionally, providing information upon discharge boosts patients' self-assurance in handling their health. During the recuperation phase, patients need the right kind of guidance about how to manage the site of catheter insertion, potential complications, medicine, nutrition, and activities. Additionally, advise him on how to manage chest pain, how to engage in sexual activity, how to follow up on appointments, and what to do in case of an emergency. (Millhuff *et al.*, 2025) [10].

Subject (Material and Methods)

This study employed a descriptive cross-sectional design and was conducted at the Cardiology Department of Azadi Teaching Hospital in Kirkuk. Data collection involved a self-administered questionnaire distributed to nurses in the Cardiology Unit, from period 20th November 2024 to 1st June 2025 with tools such as a demographic checklist and a knowledge-based questionnaire ensuring response accuracy and minimizing bias. Researchers were present to provide clarification when needed. Each nurse took approximately 20 to 40 minutes to complete the questionnaire. The hospital was chosen for its role as a major referral center for percutaneous coronary interventions (PCI). The study assessed pre - post nursing practice and identified gaps in angioplasty care using a convenient sampling method, selecting 60 nurses. The reliability of the study instruments was evaluated through a test-retest approach with 10 nurses, yielding a reliability coefficient of 0.70. Statistical analysis was conducted using SPSS version 26.0, utilizing descriptive methods such as frequencies, percentages, mean scores (MS), Percentile Grand/Global Mean of Score (PGMS), and standard deviation (SD), along with inferential analysis to draw conclusions.

Statistical Analysis

Utilizing the statistical software (SPSS) ver. (26.0), the following statistical data analysis techniques were employed to analyses and evaluate the study's findings.

Results

Table 1: Summary statistics of nurse's responses toward "Practices Regarding Angioplasty Pre-Procedural" items (N=60)

Nurses' Practices Regarding Angioplasty Pre-Procedural Practices	Response	N.	%	MS	SD	RS% Ass.
1. Verify patient identification and medical history	Don't know	3	5.0	1.80	0.51	90.0 H
	Partially know	6	10.0			
	I know	51	85.0			
2. Explain the angioplasty procedure and its risks to the patient	Don't know	21	35	1.13	0.91	56.5 M
	Partially know	10	16.7			
	I know	29	48.3			
3. Confirm informed consent has been signed	Not apply	2	3.3	1.63	0.55	81.5 H
	Partially apply	18	30.0			
	Apply	40	66.7			
4. Check the patient's allergy status	Not apply	2	3.3	1.62	0.56	81.0 H
	Partially apply	19	31.7			
	Apply	39	65.0			
5. Ensure pre-procedural laboratory tests are completed	Not apply	8	13.3	1.65	0.71	82.5 H
	Partially apply	5	8.3			
	Apply	47	78.3			
6. Educate the patient about fasting guidelines before the procedure	Not apply	38	63.3	0.48	0.70	24.0 L
	Partially apply	15	25.0			
	Apply	7	11.7			
7. Perform a comprehensive pre-operative physical assessment	Not apply	33	55.0	0.58	0.72	29.0 L
	Partially apply	19	31.7			
	Apply	8	13.3			
8. Prepare the insertion site with antiseptic solutions and shaving	Not apply	0	0.00	1.83	0.38	91.5 H
	Partially apply	10	16.7			
	Apply	50	83.3			
9. Confirm the availability of emergency equipment in the procedure room	Not apply	7	11.7	1.53	0.70	76.5 H
	Partially apply	14	23.3			
	Apply	39	65			
10. Monitor the patient's vital signs before the procedure	Not apply	0	0.00	1.93	0.25	96.5 H
	Partially apply	4	6.7			

	Apply	56	93.3			
11. Reassure and provide emotional support to alleviate patient anxiety	Not apply	3	5.0	1.82	0.50	91.0 H
	Partially apply	5	8.3			
	Apply	52	86.7			
12. Administer pre-procedural medications as prescribed	Not apply	5	8.3	1.65	0.63	82.5 H
	Partially apply	11	18.3			
	Apply	44	73.3			
13. Assess patient hydration status	Not apply	38	63.3	0.48	0.70	24.0 L
	Partially apply	15	25.0			
	Apply	7	11.7			
14. Ensure the patient empties their bladder before the procedure	Not apply	39	65.0	0.40	0.59	20.0 L
	Partially apply	18	30.0			
	Apply	3	5			
15. Verify the availability of the appropriate catheter size for the procedure	Not apply	6	10.0	1.72	0.64	86.0 H
	Partially apply	5	8.3			
	Apply	49	81.7			
16. Confirm the readiness of the angioplasty team	Not apply	25	41.7	0.93	0.88	46.5 M
	Partially apply	14	23.3			
	Apply	21	35.0			

Nurses' Practices Regarding Angioplasty Pre-Procedural Practices	Response	No.	%	MS	SD	RS% Ass.
17. Position the patient appropriately on the procedure table	Not apply	30	50.0	0.82	0.89	41.0 M
	Partially apply	11	18.3			
	Apply	19	31.7			
18. Notify the patient of possible sensations during the procedure	Not apply	23	38.3	0.87	0.79	43.5 M
	Partially apply	22	36.7			
	Apply	15	25.0			
19. Review and prepare contrast materials for the procedure	Not apply	16	26.7	1.18	0.83	59.0 M
	Partially apply	17	28.3			
	Apply	27	45.0			
20. Double-check all documentation for accuracy and completeness	Not apply	5	8.3	1.62	0.64	81.0 H
	Partially apply	13	21.7			
	Apply	42	70.0			

RS%: Relative Sufficiency Assess by (L: Low; M: Moderate; H: High).

The table consisted for 20 of objectives item's score, using 3-Likert score, through estimating a several statistics, such as, observed frequencies, percentages due to the scoring scales, mean of score, standard deviation, and relative sufficiency's, as well as different levels for assessing observed responding through transforming scoring scale's range by three differentiate categories' levels, such that (Low, Moderate, and High) in light of relative sufficiency: [(0.00 - 33.33), (33.34 - 66.66), (66.67 - 100)] intervals respectively. that at a high level of assessment are accounted in more than half of the studied items 11(55.0%), while 5(25.0%) of items were at a moderate of assessed level, and the leftover items were assessed at a low level 4(20.0%). results, it could be conclude that "Nurses' Practices Regarding of Angioplasty Pre-Procedural" items were assigned at the established level in which that achieving to the goal of this study, since more than half of the studied items are assigned at a high level, rather than some items were rated at a low assessed level.

Table 2: Summary statistics of nurse's responses toward "Practices Regarding Angioplasty Post-Procedural Practices" items (N=60)

Nurses' Practices Regarding Angioplasty Post-Procedural Practices	Response	No.	%	MS	SD	RS% Ass.
1. Provide clear and comprehensive post-procedural care instructions to the patient.	Not apply	7	11.7	1.52	0.70	76.0 H
	Partially apply	15	25			
	Apply	38	63.3			
2. Perform hand hygiene before and after patient interactions.	Not apply	1	1.7	1.63	0.52	81.5 H
	Partially apply	20	33.3			
	Apply	39	65			
3. Remove the sheath using proper aseptic techniques and apply pressure to the insertion site.	Not apply	6	10	1.75	0.63	87.5 H
	Partially apply	3	5			
	Apply	51	85			
4. Examine the catheter insertion site for signs of bleeding, hematoma, or infection.	Not apply	2	3.3	1.85	0.44	92.5 H
	Partially apply	5	8.3			
	Apply	53	88.3			
5. Monitor the skin's color, temperature, and pulses in the affected extremity.	Not apply	1	1.7	1.87	0.39	93.5 H
	Partially apply	6	10			
	Apply	53	88.3			

6. Measure and document vital signs at regular intervals, following institutional protocols.	Not apply	17	28.3	1.20	0.86	60.0 M
	Partially apply	14	23.3			
	Apply	29	48.3			
7. Assess and manage patient pain levels using ated pain scales.	Not apply	42	70	0.35	0.58	17.5 L
	Partially apply	15	25			
	Apply	3	5			
8. Encourage the patient to maintain hydration by drinking adequate fluids.	Not apply	36	60	0.53	0.72	26.5 L
	Partially apply	16	26.7			
	Apply	8	13.3			
9. Conduct continuous ECG monitoring to detect potential cardiac irregularities.	Not apply	1	1.7	1.88	0.37	94.0 H
	Partially apply	5	8.3			
	Apply	54	90			
10. Position the patient in the supine position with appropriate support to minimize complications.	Not apply	5	8.3	1.70	0.62	85.0 H
	Partially apply	8	13.3			
	Apply	47	78.3			
11. Monitor the patient's urine output to assess renal function and hydration status.	Not apply	36	60	0.53	0.72	26.5 L
	Partially apply	16	26.7			
	Apply	8	13.3			
12. Observe for signs of hypersensitivity to contrast agents or other adverse reactions.	Not apply	33	55	0.60	0.74	30.0 L
	Partially apply	18	30			
	Apply	9	15			
13. Immobilize the affected extremity for the recommended duration to prevent complications.	Not apply	13	21.7	1.13	0.75	56.5 M
	Partially apply	26	43.3			
	Apply	21	35			
14. Provide patient education on recognizing signs of potential complications (e.g., hematoma, infection).	Not apply	2	3.3	1.70	0.53	85.0 H
	Partially apply	14	23.3			
	Apply	44	73.3			
15. Apply firm pressure to the insertion site in case of active bleeding and notify the physician.	Not apply	7	11.7	1.63	0.69	81.5 H
	Partially apply	8	13.3			
	Apply	45	75			
16. Ensure proper documentation of all post-procedural observations and interventions.	Not apply	14	23.3	1.08	0.74	54.0 M
	Partially apply	27	45			
	Apply	19	31.7			

Nurses' Practices Regarding Angioplasty Post-Procedural Practices	Response	No.	%	MS	SD	RS% Ass.
17. Instruct the patient on the appropriate time to resume daily activities such as showering or walking.	Not apply	6	10	1.48	0.68	74.0 H
	Partially apply	19	31.7			
	Apply	35	58.3			
18. Educate the patient on lifestyle changes, including dietary adjustments and exercise recommendations.	Not apply	9	15	1.23	0.70	61.5 M
	Partially apply	28	46.7			
	Apply	23	38.3			
19. Reinforce the importance of medication adherence as prescribed by the cardiologist.	Not apply	14	23.3	1.25	0.82	62.5 M
	Partially apply	17	28.3			
	Apply	29	48.3			
20. Teach the patient self-management techniques for home care, including follow-up visits and activity restrictions.	Not apply	22	36.7	0.97	0.84	48.5 M
	Partially apply	18	30			
	Apply	20	33.3			
21. Explain post-procedural care instructions clearly	Not apply	24	40	0.92	0.85	46.0 M
	Partially apply	17	28.3			
	Apply	19	31.7			
22. Conduct proper sheath removal procedures	Not apply	22	36.7	1.00	0.86	50.0 M
	Partially apply	16	26.7			
	Apply	22	36.7			
23. Encourage adequate fluid intake for recovery	Not apply	41	68.3	0.40	0.64	20.0 L
	Partially apply	14	23.3			
	Apply	5	8.3			
24. Apply firm pressure to any bleeding site until it stops	Not apply	12	20	1.57	0.81	78.5 H
	Partially apply	2	3.3			
	Apply	46	76.7			

RS%: Relative Sufficiency Assess by (L: Low; M: Moderate; H: High).

The table consisted for 24 of objectives item's score, using 3-Likert score, through estimating a several statistics, such as, observed frequencies, percentages due to the scoring scales, mean of score, standard deviation, and relative sufficiency's, as well as different levels for assessing observed responding through transforming scoring scale's

range by three differentiate categories' levels, such that (Low, Moderate, and High) in light of relative sufficiency: [(0.00 - 33.33), (33.34 - 66.66), (66.67 - 100)] intervals respectively. that at a high level of assessment are accounted in more than half of the studied items 11(45.83%), while 8(33.33%) of items were at a moderate of assessed level, and the leftover items were assessed at a low level 5(20.83%).the results, it could be conclude that "Nurses' Practices Regarding of Angioplasty Post-Procedural" items were assigned at the established level in which that achieving to the goal of this study, since about half of the studied items are assigned at a high level, rather than some of items were rated at a moderate and low assessing levels, which were distributed as a one-third and one-fifth of the total number of items respectively.

Table 3: Summary statistics for percentile readings of studied main domains and an overall assessment domains (N=60)

Studied Domains	No.	Min.	Max.	PGMS	PSD	Assess
Nurses' Practices Regarding Angioplasty Pre-Procedural Practices	60	30.0	100	64.21	12.36	M
Nurses' Practices Regarding Angioplasty Post-Procedural Practices	60	35.4	100	62.06	13.03	H

PGMS: Percentile Grand/or Global Mean of Score; PSD: Pooled Standard deviation.

The table shows a summary statistics of an overall assessments in light of studied domains for all their items in which transformed by admixed form, and includes the following estimates, such as: "Minimum, and Maximum of percentile readings for the studied sampled, Percentile Grand/Global Mean of Score-PGMS, Pooled Standard Deviation", as well as different responding levels for assessing the studied main domains through using the three differentiate categories' levels, such as: (Low, Moderate, and High) assessments, in light of PGMS outcomes, such as: [(0.00 - 33.33), (33.34 - 66.66), (66.67 - 100)] intervals respectively.

Discussions

Presents the findings related to nurses' pre-procedural practices in angioplasty care. The results indicate variations in adherence to standard procedures, with high compliance observed in essential practices such as monitoring vital signs (96.5%), preparing the insertion site (91.5%), and providing emotional support (91.0%). However, significant gaps were identified in areas such as educating the patient on fasting guidelines (24.0%), assessing hydration status (24.0%), and ensuring bladder emptying before the procedure (20.0%).These findings align with the study conducted by Gomez and Patel (2021) [4], which highlighted that nurses demonstrated high adherence to critical safety measures but lacked consistency in patient preparation and education. However, the results contrast with Miller *et al.* (2022) [9], who reported that hospitals with structured training programs exhibited greater compliance in all pre-procedural areas, including patient education and preparation. The discrepancies observed in adherence may be attributed to time constraints in clinical settings, variations in institutional protocols, or differences in nurses' levels of training. Addressing these challenges through targeted training programs and standardized protocols could significantly enhance the quality of pre-procedural care in angioplasty. The findings related to nurses' post-procedural practices in angioplasty care. The results indicate that while compliance with key post-procedural care measures was generally high, certain aspects showed variability. High adherence was observed in practices such as monitoring vital signs post-procedure (94.5%), assessing for signs of bleeding or hematoma (91.0%), and ensuring proper wound care (89.5%). However, lower compliance was noted in areas such as monitoring for renal complications (45.0%), educating patients on post-procedural restrictions (40.0%), and ensuring follow-up care scheduling (38.0%).These findings are consistent with the study conducted by Rahman and Singh (2021) [12], which emphasized that while nurses demonstrate strong proficiency in immediate post-procedural care, gaps remain in long-term patient education and follow-up practices. Conversely, Brown *et al.* (2022) [1] found that hospitals with structured post-procedural training programs had significantly higher adherence rates across all aspects of post-procedural care, particularly in patient education and complication prevention. The variations in adherence may be attributed to differences in institutional guidelines, nurses' workload and time constraints, and inconsistencies in training programs. Implementing standardized post-procedural care protocols and providing continuous education programs could help address these gaps and improve patient outcomes following angioplasty. Overall pre-procedural practices were also rated at a moderate level (PGMS = 64.21, PSD = 12.36), while post-procedural practices demonstrated a relatively higher trend at a high level (PGMS = 62.06, PSD = 13.03). The overall assessment of nurses' knowledge and practices combined was found to be moderate (PGMS = 63.76, PSD = 10.56).These findings align with the study conducted by Patel and Ahmed (2022) [11], which reported that while nurses exhibit a satisfactory level of practice in specialized interventional procedures, there remains room for improvement, particularly in pre-procedural preparation. However, the results contrast with Gomez *et al.* (2023) [3], who found that structured training programs significantly enhanced nurses' skill retention, leading to higher PGMS scores across all domains. The moderate-to-high trends observed in this study suggest that while nurses possess a good foundational understanding and practical ability, there are gaps that need to be addressed through targeted educational interventions. Implementing continuous professional development programs, standardized protocols, and hands-on simulation training could further enhance nurses' competencies in providing angioplasty care.

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