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Audit of the Nursing Care Standards Before Coronary Angiography in Patients Visiting Angiography

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Abstract

Background: Coronary angiography is an invasive procedure used to diagnose coronary artery disease, and standard nursing care before, during, and after this procedure. A comparison of the current care with the existing standards can lead to improved nursing care quality, increased patient safety, and reduced medical costs.
Objectives: Therefore, the aim of this study was to audit the nursing care provided before angiography.
Methods: In this analytical descriptive study, the nursing care provided to 400 patients undergoing coronary angiography was evaluated using the event-based sampling method in the angiography ward of hospitals affiliated to Shahrekord University of Medical Sciences. Data were collected by a demographic form and a standard nursing care checklist. Data were analyzed using descriptive statistics (i.e., frequency, mean, and standard deviation) and analytical statistics (i.e., chi-square, independent *t*-test and analysis of variance) in SPSS 18 version.
Results: Before angiography, nursing care compliance score was 51.63 $\pm$ 4.21, which was significantly different than the normal value (normal score: 61 - 81). At the preoperative stage, 25 (6.3%), 374 (93.5%), and 1 (3%) caring cases, the standard of nursing care was poor, moderate, and good, respectively.
Conclusions: Based on our results, in one case, the provided nursing care was in accordance with the standard of nursing care at the preoperative stage of angiography, which can be attributed to the lack of education, control, facilities and awareness among nurses about the importance of standard care.

Keywords: Coronary Angiography, Audit, Nursing Care

1. Background

Cardiovascular diseases are the leading cause of death (1), and in many countries, they have been recognized as one of the most important human health threats (2). It has been estimated that one in three deaths in 2020 will be due to heart diseases (3). The prevalence of these diseases is increasing due to the characteristics of urban life, decreased physical activity, increased use of tobacco, occupational and mental stresses, and disregard for health recommendations (4).

The most common cardiovascular disease is myocardial infarction, with an estimated incidence of 181.4 per 100,000 cases in Iran (5). Early diagnosis and complete treatment of the cardiovascular diseases can reduce their complications (6). Prevention of coronary heart disease, and consequently, reduced morbidity and morbidity among these patients is still one of the concerns of the healthcare systems worldwide (7).

Achieving this goal requires a greater understanding of the risk factors for heart disease, improved quality of care, and early detection of the disease (8). Today, new tests and diagnostic methods have opened up new windows of opportunity for the diagnosis of heart diseases, one of the ways to diagnose these diseases is coronary angiography (2). Coronary angiography is an invasive procedure used to diagnose known or suspected coronary artery disease (9).

According to the latest data from the American Heart Association, nearly three million patients undergo invasive and diagnostic tests each year in the United States (6), in Iran, about 16 to 18 thousand cases of coronary angiography are performed annually (2). Early diagnosis and complete treatment of cardiovascular diseases can reduce their complications (10). Numerous studies have shown that survival in patients undergoing premature angiography is

higher (11), but the role of nurses in this invasive procedure is undeniable (12).

Nurses are the largest human resources in most health care organizations and play a major role in providing quality health care services (11). Nurses adjust care plans and provide care according to the conditions of each patient. Standardized care based on scientific findings increases the quality of nursing care, the most valuable quality measure in the health system is the evaluation of nurses' activities in providing nursing care (13). According to the study of Cancian et al. (14), further improvements are necessary to meet the standards of care with regards to diagnosis, treatment, follow-up and home care. The care situation affects hospitalization and the quality of follow-up visits (14). Nakano et al. (15) stated that meeting process performance measures, which reflect care in concordance with clinical guideline recommendations, was associated with substantially lower one-year mortality among patients with incident heart failure.

Nowadays, the quality and quantity of standard nursing care is not suitable. Although many causes for this problem can be considered, lack of a proper and effective quality control and auditing system can lead to nurses' lack of interest in the quality of care (14). Service organizations have developed many plans to improve the quality of services, but service quality is still the biggest problem these organizations face. The first and most important factor in improving the quality of care is measuring and auditing the quality of performance (15).

As one of the largest service providers, nurses must have extensive knowledge and skills to deliver customized care. The quality of nursing care depends to a large extent on the quality of nursing services provided, which requires an audit to assess their performance and compliance with standards (16). Standards of care are essential for the promotion of nursing care and must be evidence-based, and as technology and research progress, standards should be reviewed every five years. In addition to developing standards, monitoring standards is also essential to improve the quality of services.

One of the ways to improve and measure the quality of care is auditing, and auditing is a fact-finding inspection of a specific problem that is systematically performed and provides strategies to improve the quality of nursing care. This process involves setting standards, observing care, comparing standards, and making changes (17). The first and most important group benefiting from this process are the patients (18). Intensive care units mainly contribute to the most important problems in health care systems (19), which include issues such as inadequate patient care, incomplete communication between health care workers and staff and patients, failure to express differences in staff performance by patients, and many deficiencies in patient care on the verge of death (20). Therefore, this study aimed to audit the compliance of nursing care standards with the standards developed in patients undergoing coronary angiography referred to the angiography wards of hospitals affiliated to Shahrekord University of Medical Sciences. It is hoped that its results will lead to the improvement and better employment of care protocols in patients undergoing angiographic procedures.

2. Objectives

The present study was performed to audit the nursing care standards before coronary angiography in patients referred to angiography departments of hospitals affiliated to Shahrekord University of Medical Sciences.

3. Methods

This cross-sectional descriptive-analytical study was approved by the Ethics Committee of Shahrekord University of Medical Sciences (code: IR. SKUMS.AC.1397.252). The sample size was estimated to be 400 cases based on a review of the literature and the following formula:

$$n = \frac{Z^2 pq}{d^2}$$

The researcher investigated nursing care related to cardiac angiography. Data were collected using a demographics checklist and the standard nursing care checklist. The inclusion criteria included patients undergoing angiography at the research environment and nurses working in the angiography ward for six months. Checklist of the "nursing care standards audit" is formed based on the existing standard protocol that includes the three sections before coronary angiography (30 questions), during coronary angiography (10 questions), and after coronary angiography (32 questions).

The responses to this questionnaire included "yes", "no", and "incomplete", 3, 2, and 1 scores are assigned to each of these responses, respectively.

In this study, content validity and face validity were used to determine the validity of the audit checklist. After preparing the checklist, the content validity of each phrase was assessed by Waltz and Basel's four-choice scale by 10 experts who were cardiologists, academic members of the nursing department, and clinical nurses. Waltz and Basel's scale consisted of three parts of relevance, clarity, and simplicity, with scores ranging from one to four; the content validity index for each of the items of relevance, clarity, and simplicity was considered at least 75%. All the phrases

above 75% were retained, and options below 75% were excluded as suggested by the experts.

To check the reliability of the checklist "Nursing care compliance standards audit based on standards developed for patients undergoing coronary angiography", The agreement method was used between the observers. Audit checklist observance of nursing care standards in patients under coronary angiography, it was given to the second observer, who was as accurate and knowledgeable as the first researcher, two observers completed the checklist for 10 patients simultaneously and correlation coefficients between observations was %93.

After approving the validity and reliability of the checklist, the researcher presented at daily shifts in the mornings to observe the nursing care provided to patients undergoing angiography using a checklist. The respective nurse's performance was monitored before coronary angiography.

Data on compliance with the nursing care standards was based on existing quality standards and was categorized as low, moderate, and good.

To analyze the data, descriptive (i.e., frequency, percentage, mean and standard deviation) and analytical statistics (i.e., chi-square, independent *t*-test, and Tukey's post hoc analysis) were run using SPSS version 18.

4. Results

All nurses were female (100%), mostly married (67%), (92%), and had a bachelor's degree, (85.5%) related education and (100%) experience working in other wards of the hospital. The mean age of the participants was 35.18 ± 2.88 years.

Also, 56.7% of the patients were male, 84.7% had elementary education, 66.3% were unemployed or retired and 72% lived in the city. The patients' mean was 59.10 ± 8.47 years (Table 1).

Frequency distribution of overall performance of the nurses according to their compliance before angiography showed that 6.3%, 93.5%, and 0.3% of the nurses in the pre-angiographic stage had poor, moderate, and good compliance with nursing care standards, respectively (Table 2).

The mean and standard deviation of the pre-procedure care score was 51.63 ± 4.21, which was significantly different than the normal value (40 - 60) (Table 3).

Based on the findings, there was a statistically significant difference between the mean normal score and the mean score of the care provided by nurses.

Table 1. Demographic Characteristics of the Participants (Nurses and Patients)[a]

Participants' Variables	Nurses	Patients
Sex		
Male	0 (0)	227 (56.7)
Female	400 (100)	173 (43.3)
Marital status		
Single	132 (33)	10 (2.5)
Married	268 (67)	390 (97.5)
Level of Education		
Elementary	0 (0)	234 (57.5)
The junior school	0 (0)	90 (22.5)
High school	0 (0)	62 (15.5)
Bachelor	32 (8)	10 (2.5)
Master of sciences	368 (92)	4 (1)
Training period		
Yes	342 (85.5)	0 (0)
No	58 (14.5)	0 (0)
Occupation		
Employed	0 (0)	61 (15.3)
Unemployed	0 (0)	339 (84.7)
Living location		
City	0 (0)	285 (66.3)
Rural	0 (0)	135 (33.7)

[a]Values are expressed as No. (%).

Table 2. Relative and Absolute Frequency Distributions of Compliance with the Nursing Care Standards Before Angiography[a]

Adherence to Nursing Caring Standards in Pre-Cardiac Angiography	Values
Poor	25 (6.3)
Medium	374 (93.5)
Good	1 (0.3)
Total	400 (100)

[a]Values are expressed as No. (%).

5. Discussion

Comparison of the rate of compliance of nursing care provided before angiography with the standards of care showed that the mean and standard deviation of nurses' score was 51.63 ± 21.21, which was significantly different than the standard care score ($P < 0.001$). On the other hand, Also, only 1% of patients received all standard care. Although we could not find studies on this subject, the studies of audit in Iran supported our results.

Goodarzi et al. performed a study entitled "factors af-

Table 3. The Mean and Standard Deviation of the Standard Nursing Care Performance Score in Pre-Angiography Units Studied by Nurses

Variable	Mean ± Standard Deviation	Domain	Standard Rate Care	P Value
Nursing Care Before Angiography	4.21 ± 51.63	(66 - 40)	81	0.0001[a]

[a]Significant.

fecting the process of patient education from the nurses' perspective". Their results showed that 52.1% of the nursing facilitators such as: a positive attitude towards patient education, feeling of duty in patient education as one of the nursing priorities, and participation in in-service training courses in learning new methods of education due to lack of staff and time, inappropriate location, lack of educational pamphlets and lack of client interest. Yan found a positive correlation between receiving training by the nurses and the quality of patient care (21).

The results of Mehdipour et al. showed a significant difference between the satisfaction score of patients education before and after the intervention, before intervention nurses had a poor performance in patient education, which resulted in a decrease in patient satisfaction (22).

In these studies, the focus was on the factors affecting the process of patient education from the point of view nurses; therefore, education in the nursing field is highly significant. One important factor in this regard is that nurses do not apply the standard nursing care before angiograph as they do not pay attention to their educational needs.

Salimi et al. (23) conducted a study in 2016 entitled "auditory nursing care related to separation of neonates from mechanical ventilation in Neonatal Intensive Care Units", where the nursing care related to neonatal separation from mechanical ventilation was audited. It was concluded that the rate of compliance of nursing care with standards was 68.3%, which was 71.4% pre-separation, 65.7% during separation, and 65.4% after separation (24). Their results revealed that the care provided to patients under mechanical ventilation was far from the standards. Therefore, to promote the quality of care, they suggested the use of Nursing Care Guidance and clinical supervision of managers on how it is implemented.

In a study entitled "audit reporting of nurses in Neonatal Intensive Care Units" conducted by Yosefi Roshan et al. (25) in hospitals of Babol University of Medical Sciences in 2016, 400 samples of nursing reports were evaluated. They found that 50.7% of the reports were correct (75% -100% acceptable), 10.26% was relatively correct (50% - 74% acceptable) and 39.04% were false (unacceptable). The findings of this study showed that nurses working in neonatal intensive care units need more training on the basics of reporting and its standards as well as specific supervisory and management interventions to reduce reporting errors (23). In the same vein, we recommend supervision, education, and use of the clinical guidelines as three important factors for nurses to apply in standard caring.

5.1. Study Limitations

The limitations of this study include simultaneous entry of several patients for angiography and patients not cooperating with the researcher.

5.2. Conclusions

The findings of the study showed that nursing care auditing could identify weaknesses in providing standard care, and regular evaluation of nursing care and nursing protocols can improve the process of caring, especially in critical care such as angiography. Auditing nursing care is cost-effective and can improve service quality and increase patient satisfaction.

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Footnotes

Authors' Contribution: SHS contributed to study design, drafting of the manuscript, and supervision. AH contributed to technical/material support and performed revisions for important intellectual content. MM contributed to data collection and implementing the project of study. FD performed data analysis and supervision.

Conflict of Interests: There are no conflicts of interest.

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