How to Cite:
Aldakheel, A. H. A. (2022). Post-operative nursing safety practices for cardiac catheterization patients. *International Journal of Health Sciences*, *6*(S3), 12177–12123. https://doi.org/10.53730/ijhs.v6nS3.9138

Post-operative nursing safety practices for cardiac catheterization patients

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***Abstract*---**Background: In recent years, there has been a greater emphasis on the epidemiological of mistakes and adverse outcomes rather than on procedures that decrease such incidents. aim of study is to: Assess nurses Knowledge regarding preoperative nursing safety practices for cardiac catheterization patients. Methodology: The descriptive research design was utilized for this study. and the sitting of the study was at AL Hussein teaching hospital in Al muthanna governorate. The subjects of the study consisted of all nurses (30 nurses) working at the above mentioned. The toll of the study included the safety practices in the postoperative phase cardiac catheterization. These were categorized a checklist related to the availability of the equipment and safety items provided for patients at the catheterization unit. This checklist items was checked as being either available (2) ,or (1) not available (0). As regard safety it is a three Likert scale ranged from done completely (2), done incompletely (1), to not done (0). Result: the main results of study reveal that, there was no a highly significant relation between socio-demographic characteristics and nursing safety practices for cardiac catheterization patients at preoperative phase. Conclusion: the studied nurses had no significance in practicing safety practices in cardiac catheterization centers. Educational levels and years of experience had no statistical significant effects on nurses' safety practices. Recommendation: Pre-services on the job training programs are advocated for all nurses about patients' safety in nursing work requirement and utilize the results of the current study to ameliorate& update cardiac catheterization patient's safety practices with continuing evaluation.

***Keywords*---**post-operative, nursing, safety, catheterization patients.

Introduction

The initial report Physiologist Claude Bernard conducted cardiac catheterization on a horse in 1844[1]. The temperature in both ventricles was measured using glass tubes placed into the jugular vein and carotid artery. Bernard et al. utilized the method to monitor intracardiac pressures later on[1]. Werner Forssmann conducted the first human cardiac catheterization in 1929 at Eberswalde, Germany. He catheterized himself using a urethral catheter via his left antecubital vein into his right ventricle (RV), a procedure that is often denied by research ethics boards, and verified placement by X-ray[2]. Andre Cournand and Dickinson Richards enhanced the procedure later, demonstrating its safety even when the catheter was kept in place for more than 24 hours[3]. They devised the direct Fick technique for detecting carbon dioxide (CO), which estimates oxygen consumption by monitoring carbon dioxide exchanges and calculates oxygen uptake from such an assuming respiratory quotient (RQ). The straight oxygen Fick technique is generally recognized as the gold in cardiac output measurement. This approach allows for a better knowledge of right heart hemodynamics in both healthy and diseased people. Hellems et al. later devised a method for detecting systolic pressure pressure (PCWP) under fluoroscopic supervision, which increased the test's use[4]. Lategola and Rahn described by use of a self-guiding catheter for the first time in 1953[5]. Further improvements led to the creation of a balloon flotation catheter by Jeremy Swan and William Ganz [6].

Cardiac catheterization is a diagnostic and treatment technique for cardiovascular problems. A thin, flexible, hollow tube is put into a major blood artery that runs to the heart via the groin, neck, or arm. It is the placement of a device into a heart chamber or vessel. This one is performed for both research and intervention objectives. Catheterization of coronary arteries and catheter of heart chambers and valves are the most common subsets of this technique. It is defined as a combination hemodynamic and angiographic method performed for diagnostic and, in certain cases, therapeutic reasons[7]. This technique collects information such as blood supply adequacy thru the arteries, arterial pressure, blood flow across the chambers of the heart, blood sample collection, and x-rays of the heart's ventricular or arteries. Cardiac catheterization can be conducted on either sides of the heart and examines various functions on both the left and right sides[8]. During the right side of the heart test, tricuspid and pulmonary valve functioning are assessed, as well as pressures and blood samples from the right atrium, ventricle, and pulmonary trunk. A catheter is inserted via an artery to assess the blood flow of the coronary, the functioning of the mitral and aortic valves, and the function of the left ventricle[9] .

Objectives

Determine the Preoperative nursing safety practices for cardiac catheterization patients.

Research Methodology

A descriptive research design was utilized for this study, the study was conduct in Almuthanna teaching hospital on 30 nurses and this study was carried out at the Cardiac Catheterization Center in Al Muthanna and Al Diwaneyah governorate-Iraqi. This center is affiliated to the Ministry of Health and provide paid and non-paid health services to clients and the tool was Nursing safety practices provided for patients undergoing cardiac catheterization observational checklist *(NSPPCCOC):*

- Part I: This part was related to for nurses' socio-demographic data of nurses, it included questions about age, sex, scientific education level, and experience years.
- Part II: This part included (post-phase cardiac catheterization) it consists of socio-demographic data for nurses. It was assessed through Likert scale, this part included two questions related to the availability of equipment. Safety practices provided for patients in the post-phase of cardiac catheterization were twenty one questions related to; chemical safety, psychological, and physical safety with the same scores as the pre-phase. In addition to, researcher's observation about complications occurs after the procedures. It included items related to the following:
  - Frequent assessment and monitoring of patients' status and safety such as vital signs, ECG monitoring, conscious level, and any early complaints or complications.
  - Assessment of psychological status as communication manner, fear, or anxiety.
  - Safe administering of post procedure medications.
  - Frequent revision of important items as medications side effects; follow up dates, health teaching items and danger signs.
  - Safe equipment decontamination as discarding disposal equipment, disinfection and sterilization, and safe storage of sterilized equipment.
  - Complete documentation of patients' name, medications used during the procedure, duration of procedure, complications any its management if any, vital signs and oxygen saturation all over the procedure.

Each item of the observational checklist will be scored as follows:

Done completely=2 Done incompletely=1 Not done=zero

The sum of the nurse's safety practices score was calculated ; a percentage of a total score of less than 80% or more was considered safe and a score of 50% to 80% was considered unsafe. The pre-phase safety practice was estimated as (94 total scores), for intra-phase was calculated (68 total scores), while the post-phase (56 total scores) safety practices.

Result

Table 1
Nurse's socio-demographic data in the postoperative of cardiac catheterization (n=30)

Nurse's socio-demographic data	No.	%
Level of education		
Diploma	16	53.3
Technician	7	23.3
Bachelor	7	23.3
Master degree	0	0.0
Age (years)		
20 – 29	10	33.3
30 – 39	17	56.7
40 – 49	3	10.0
Mean ± SD	32.63±5.58	
Sex		
Male	14	46.7
Female	16	53.3
Experience years		
<5	8	26.7
5 – 10	6	20.0
>10	16	53.3
Mean ± SD	9.50±5.50	

As for level of education 53.3% of the studied nurses were had diploma degree; while nurses had technical and bachelor degrees were represented equally by 23.3%. As regard to nurses' age 56.7% of them were aged 30-39 years with mean 32.77 ± 5.47. Regarding sex 53.3% of nurses were female. As for experience years 53.3% of nurses were work for more than 10 years, while 26.7% of them were working less than 5 years with mean 9.50±5.50.

Table 2
Total mean and percent scores of safety practices in postoperative of cardiac catheterization (n= 30)

Safety practices	Total score	Percent score
Safety practices provided for patient(56)		
Team work(12)	5.53 ± 2.33	46.11 ± 19.42
Chemical safety practices(2)	1.07 ± 0.83	53.33 ± 41.38
Psychological preparation(18)	14.23 ± 2.79	79.07 ± 15.49
Physical preparation(24)	19.77 ± 3.04	82.36 ± 12.65
Overall postoperative	40.60 ± 6.61	72.50 ± 11.79

Regarding team work the total mean score was 5.53 ± 2.33 with a percent score of 46.11 ± 19.42. As regard to safety practices provided items; the chemical safety practices mean changed from 1.07 ± 0.83 with a percent score of 53.33 ± 41.38,

psychological preparation total mean score was 14.23 ± 2.79 with a percent score of 79.07 ± 15.49, and physical preparation mean score was19.77±3.04 with a percent score of 82.36± 12.65. As regard to the overall post-phase safety practices the total mean score was 40.60 ± 6.61 with a percent score of72.50 ± 11.79.

Table 3
Relation between safety practices overall score and nurse's socio-demographic data in the post-phase of cardiac catheterization (n= 30)

Nurse's socio-demographic data	Overall score post phase						χ^2	^{MC}p
	Not safety (n = 1)		Incomplete safety (n = 21)		Complete safety (n = 8)			
	No.	%	No.	%	No.	%		
Level of education								
Diploma	1	100.0	11	52.4	4	50.0	1.467	1.000
Technician	0	0.0	5	23.8	2	25.0		
Bachelor	0	0.0	5	23.8	2	25.0		
Master degree	0	0.0	0	0.0	0	0.0		
Age (years)								
20 – 29	0	0.0	6	28.6	4	50.0	3.114	0.713
30 – 39	1	100.0	12	57.1	4	50.0		
40 – 49	0	0.0	3	14.3	0	0.0		
Sex								
Male	1	100.0	11	52.4	2	25.0	2.762	0.231
Female	0	0.0	10	47.6	6	75.0		
Experience years								
<5	0	0.0	5	23.8	3	37.5	4.774	0.283
5 – 10	0	0.0	3	14.3	3	37.5		
>10	1	100.0	13	61.9	2	25.0		

There is no statistical significant differences between the overall safety practices and nurses' socio-demographic data in the post-phase of cardiac catheterization.

Discussions

As regards the nurses' characteristics in the present study, they had a variety of scientific degree ranged from diploma to master degree. This variation ,no doubt provides a richer experience of nursing practices as observed by the researcher during the clinical work. This difference in educational level, provides an opportunity to formulate a very strong nursing team when nurses have different educational degrees; they can also build on each other's strengths. In addition nurses with various strengths, and skills, can demonstrate them and positively influence other nurses. In this essence Puchner et al (2006); Berentsen (2006), Carpenter (2007) and Zankana (2007) stated that the use of a wide variety of expertise within the nursing team produce richer learning experience for both nurses and students nurses[10-13]. Also the current study revealed that the age of

nurses in the three phases, was ranging from 30- to less than 40years old with experience years ranging from five to ten years and more. These varieties in age and experience provide nurses with accumulated experiences in different situations and increase their abilities in dealing with emergency situations, and increase nurses' policy makes involvement which accordingly increases patients' safety. In this line,Wong and Cummings (2007) found that; nurses' experiences and positive practices reduces the prevalence of adverse events and increase patients satisfaction and safety [14].

It has been observed that no statistical significant relation, were observed between complications that occurred in the post-phase, and the safety practices. In This context Grogan (2004) who stated that trained medical teams about team building, communication, recognizing adverse events, team decision makng, and performance feedbacks improve patients' health [15]. Also the study findings revealed no statistical significant correlation between intra-phase complication and safety practices in the post-operative. From the current study finding, can be concluded that safety practices implemented in cardiac catheterization centers in the hospital.

Conclusion

The studied nurses had no significance in practicing safety practices in cardiac catheterization centers. Educational levels and years of experience had no statistical significant effects on nurses' safety practices.

Recommendations

- Pre-services on the job training programs are advocated for all nurses about patients' safety in nursing work requirement.
- Utilize the results of the current study to ameliorate& update cardiac catheterization patient's safety practices with continuing evaluation.
- Patients' safety concept need to be more integrated in both under and post graduate nursing education.

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