OPEN ACCESS
Saudi Journal of Nursing and Health Care
Abbreviated Key Title: Saudi J Nurs Health Care
ISSN 2616-7921 (Print) |ISSN 2616-6186 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Nurses' Patient Care After Cardiac Catheterization in Al-Daman Hospital

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DOI: 10.36348/sjnhc.2023.v06i03.002 | **Received:** 09.01.2023 | **Accepted:** 21.02.2023 | **Published:** 06.03.2023

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Abstract

This study aimed to assess the level of knowledge of nurses about the safety of patients after performing a cardiac catheterization process. Merowe Medical City) from August 2021 to March 2022. The study included 35 randomly selected nurses. 13-question questionnaire was designed and the data was analyzed using statistical analysis (SPSS) and presented in graphic forms. The study showed that most of the nurses (45%) have good knowledge regarding cardiac catheterization, and (8%) have poor knowledge about complications and (11%) of the nurses has poor knowledge of the time required for the patient to remain in bed after the operation. (83%) have knowledge of the time required to remove the cardiac catheterization. The study recommended conducting workshops inside the hospital on the care of cardiac catheterization patients after the operation, and the hospital administration should hold continuous training courses so that the nurses can deal with the cardiac catheterization patient after the operation and provide the best health care.

Keywords: Nures, cardiac catheterization, Patient and care.

INTRODUCTION

Coronary Artery Disease (CAD) has remained the world's leading murderer and leading cause of public health problems, as well as one of the leading causes of morbidity and mortality in various areas. Furthermore, CAD is the leading cause of death among human adults in the United States, accounting for around one-third of all deaths in those over the age of 35 (Hadaegh *et al*., 2015). Coronary artery disease affects around 71 million people worldwide.

Coronary artery disease is responsible for almost three-quarters of all deaths from heart disease. Every year, more than 6 million cardiac catheterizations are performed in the United States (American Heart Association, 2014).

Cardiac catheterization is an invasive diagnostic and therapeutic treatment that can be used in a number of situations. It is utilized in the management of patients with heart disorders for diagnostic evaluation and therapeutic intervention. after catheterization patients transfererred to post catheterization unit, and then to wards (Smeltzer *et al*., 2014).

Cardiac catheterization is another crucial procedure for testing and learning more about the anatomy and physiology of the heart, valves, and coronary arteries.

The left and right sides of the heart, as well as the coronary arteries, are all examined during this operation (Mohammed *et al*., 2013, Ahmed, 2015).

The right side of the heart is examined for tricuspid and pulmonary valve function, as well as pressures in the right atrium, ventricle, and pulmonary artery and blood samples from the right atrium, ventricle, and pulmonary artery. Catheterization of the left side of the heart is done through an artery to check the blood flow of the coronary arteries, the operation of the mitral and aortic valves, and the left ventricle (Anderson K *et al*., 2005).

Cardiac catheterization has few contraindications; nonetheless, any treatable sickness or condition should be addressed before to catheterization to ensure the procedure's safety. Uncontrolled ventricular irritability, uncorrected electrolyte hypokalemia or digitalis toxicity, decompensated congestive heart failure and severe renal insufficiency, active gastrointestinal bleeding, active infection, and severe uncontrolled hypertension are all examples of these diseases (Suzanne, 2016).

If proper measures are taken, cardiac catheterization is a safe technique. Although problems are uncommon, they do happen and can be fatal. Hemorrhage or blockage of the artery utilized for catheter entry are the most common complications. Hematoma development, cardiac arrhythmia, allergic reaction, myocardial infarction, vasovagal attack, and renal failure are all unusual complication (American Heart Association 2014).

Nurses must assess and care for patients who have undergone cardiac catheterization procedures, as well as monitor patients for any negative signs of a change in condition, ensure safe transport, administer medication, assist with basic personal needs, and control bleeding, as well as maintain haemostatis. Patients over the age of 70, who were female, had renal failure, and had undergone percutaneous coronary intervention had a higher risk of vascular complications (Dumont J. P 2006).

In Sudan Cardiac Center for example roughly 3800 cardiac catheterization operations are performed each year. Only 3% of these are done as emergency procedures, while the rest are done on a voluntary basis. At the University of Virginia Medical Center, the recommended time in bed after percutaneous transluminal coronary angioplasty has been decreased to 4 hours, the same period required for patients undergoing cardiac catheterization (Keeling AW 2000).

Early sheath removal, minimizing venous sheath placement, and limiting heparin dosing to minimize excessive active of clotting times can all help to reduce vascular access site problems (Mandak JS 1998).

1.2 Problem statement:

Protecting and caring for the patient after cardiac catheterization is an important topic that one needs to be aware of, especially since its complications may lead to death, and since Merowe Medical City contains a cardiac catheterization department, it is necessary to know the extent of the nurses' knowledge about patient care after cardiac catheterization.

Everyone has the right to get good health care the nurse is responsible for providing this care, especially after cardiac catheterization, as he is more in contact with the patient, so he must have knowledge of the proper ways to protect the patient from complications of cardiac catheterization that may sometimes lead to death.

METHODOLOGY:

Study Design:

Hospital based descriptive study design.

Study Area:

The study was done in the Merowe medical city Merowe city, which is located in the northern state of the Sudan. It is 423 km away from the capital, Khartoum, and about 40 km, or approximately 45 minutes, from Merowe Dam .It is bordered on the north by the locality of Al-Dibba, on the south by the locality of Omdurman, on the east by the locality of Abu Hamad, and on the west by the Bayouda desert.

Aldaman hospital was built in 2007 and operated in 2016 in the name of Al-Daman Hospital. It treated 270 Yemeni wounded, and therapeutic services for Sudanese patients were operated by the end of 2016. It contains several sections, such as. Department of Accidents and Traumatology, Obstetrics and Gynecology, Hemodialysis, Oncology Department,. Internal Medicine, General Surgery, Orthopedics, urology, Intensive and intermediate care, Cardiac and cardiac catheterization unit, cardiac care unit, Imaging and diagnostic radiology, dermatology, as well as a fully equipped pharmacy and laboratory

It also has a building for doctors' housing, a building for nurses' housing, a building for co patients, a water treatment plant, a sewage treatment plant, in addition to the mortuary and the mosque.

Study Population: The study were included all nurses in al-daman hospital (Merowe medical city).

Inclusion Criteria: All nurses in all departments

Exclusion Criteria:

Nurses who not present during the study or nurses unable to fulfill the questionnaire or disagree to participate in the study**.**

Sampling:

Sample size:

All nurses in Merowe medical city (is about 35 nurses)

Sampling technique:

I will be use systemic random sampling.

Data collection:

The data was collected by using self administer questionnaire (close end question) which include personal data (like age and gender….etc) and knowledgeable question about safety of patient after cardiac catheterization.

Data analysis: I were analysis the data by using SPSS and with help of statistician.

Ethical considerations;

The study had obtained the ethical clearance from ethical committee at merowe University No (54-654) before data collection. No potential identifiers such as name, email or phone no. At the outset of the

questionnaire, participants were questioned for their agreement.

Explaining the major aim of the research was discussed at the beginning of the survey in order to give the participants clarifications about the research. By agreeing to answer the survey, that has considered as approval of the participants to involving in the study. Additionally, all of the collected data were kept with the researchers in order to protect persons' confidentiality who involved in this study.

Acknowledgement: The authors would like to acknowledge merowe university and all study participant.

Author Contributions: All searches have been performed by the researcher

Funding: This study has not received any external funding

Conflict of Interest: The authors declare that there are no conflicts of interests

RESULTS

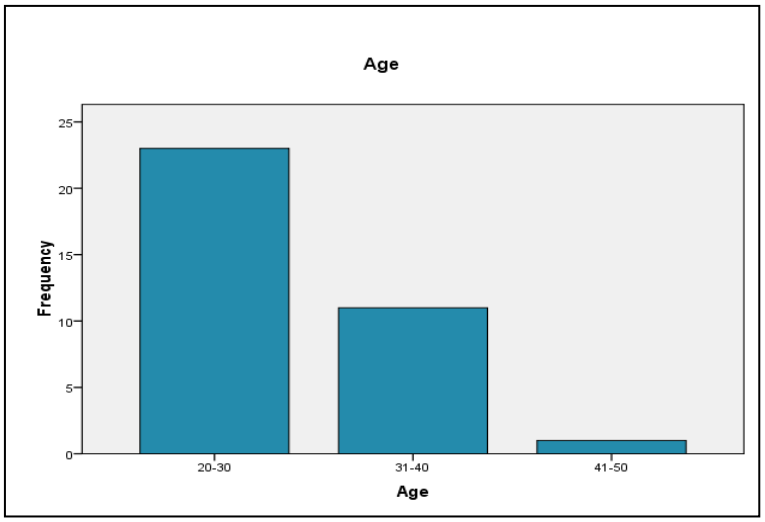

Figure 4.1: Distribution of participant's age

Figure 4.1 show that 65.7% of participants were (20-30 years old), while 31.4% of them were (31-40 years old And only 2.9% of them were (41-50 years old).

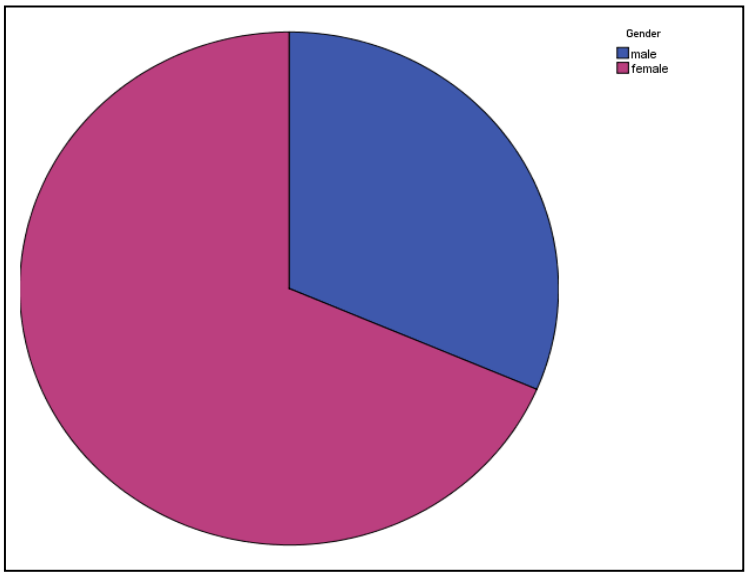

Figure 4.2: Distribution of participants with respect to gender

This figure shows most 68.6% were female and 31.4% were male.

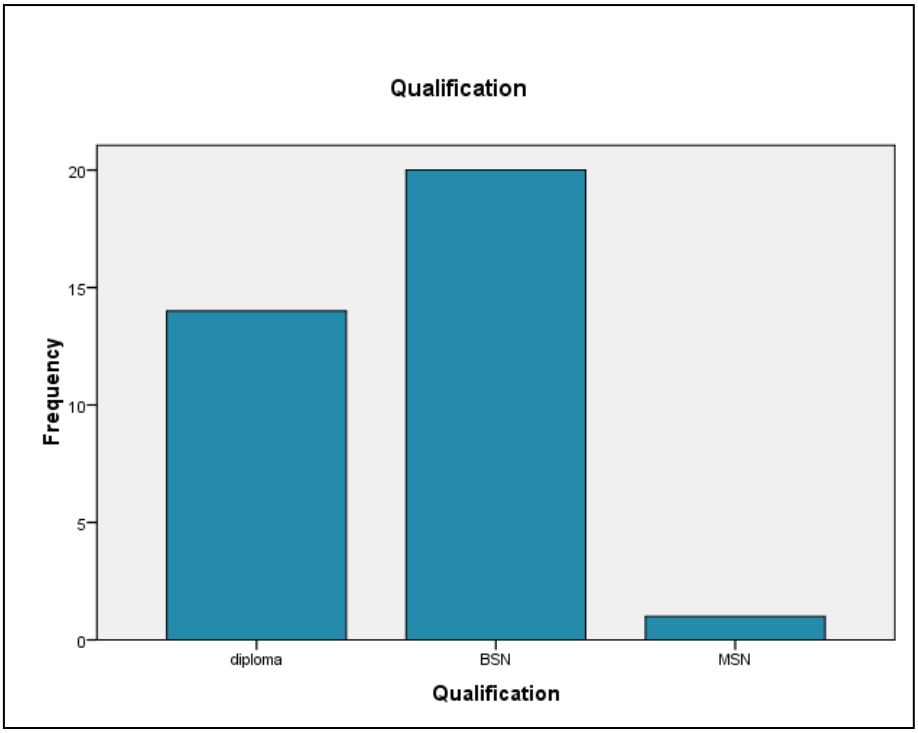

Figure 4.3: Distribution of participants with respect to qualification

This figure show that only 2.9% of participants their qualification were MSc, while 57.1% of them were have BSc, since 40% were diploma.

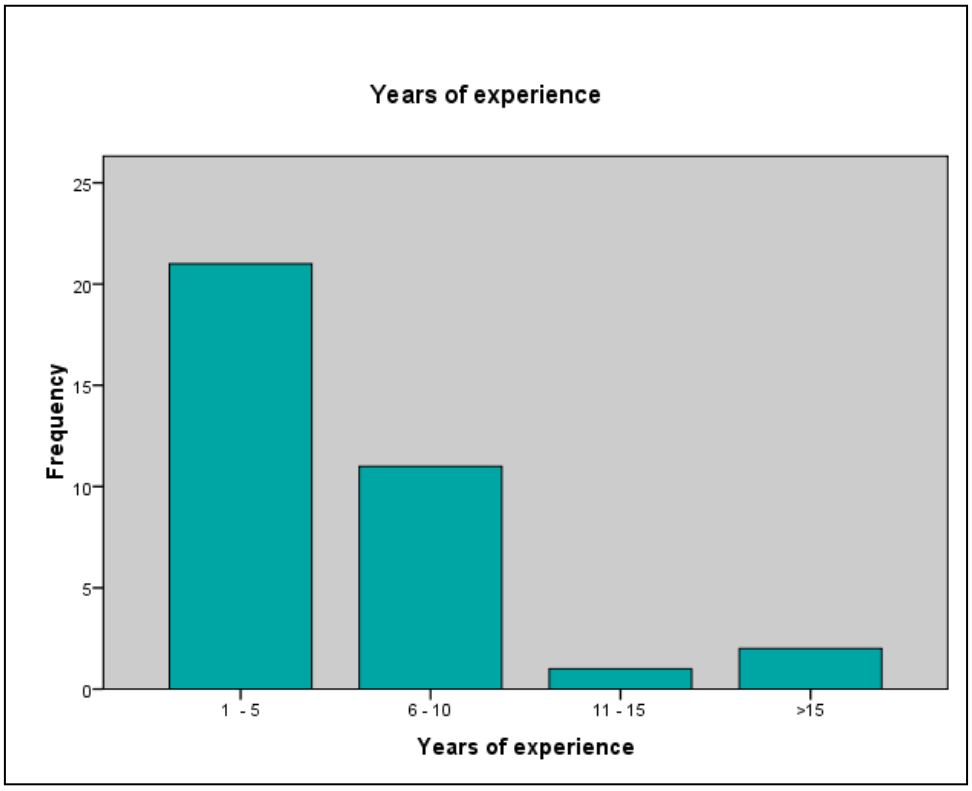

Figure 4.4: Distributon of participants with respect to years of experience

This figure show that most 60% of participants have (1-5) years of work experience, while 31.4% have (6-10) years of work experience and only 2.9% of them have (11-15) years of experience and 5.7% have >15 years of experience.

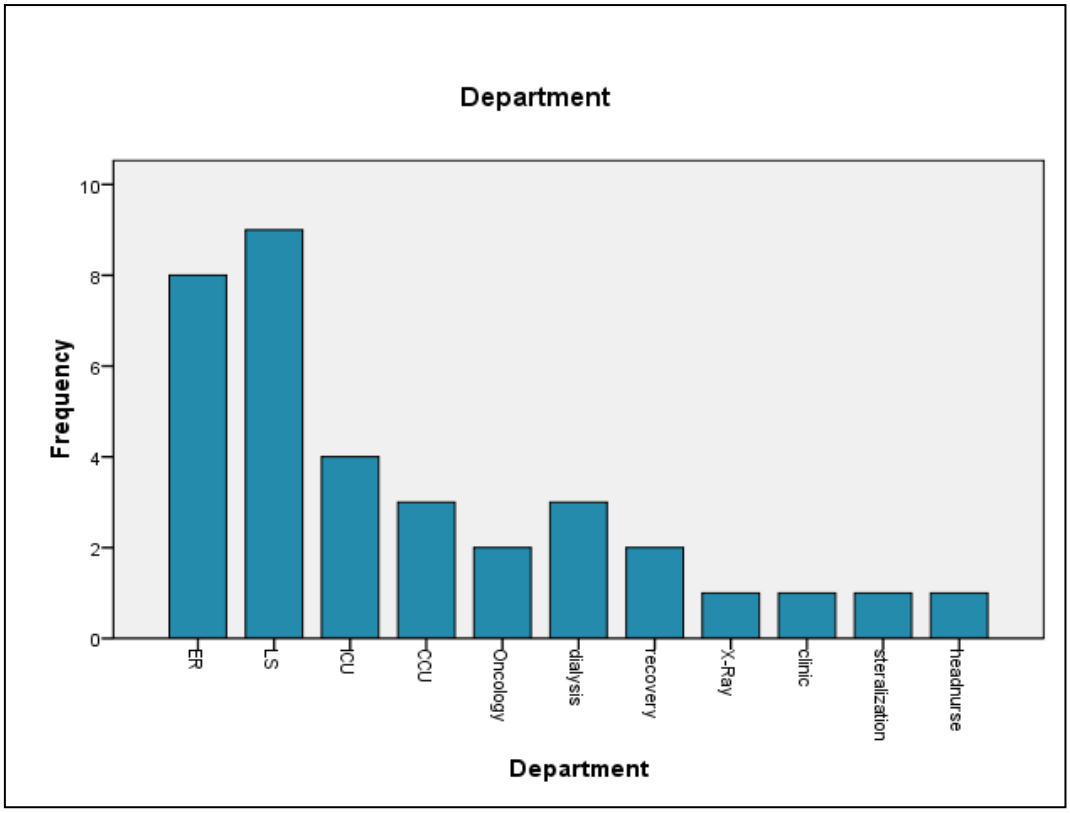

Figure 4.5: Show distribution of participants with respect to department

This figure show that most 25.7% of participants worked in LS, 22.9% of participants worked in ER, 11.4% of participants worked in ICU, 8.6% of participants worked in CCU, 8.6% of participants worked in Dialysis, 5.7% of participants worked in Oncology center, 5.7% of participants worked in Recovery, and only 2.9% of participants worked in X-ray, 2.9% of participants worked in Clinic, 2,9% of participants worked in Sterilization, since 2.9% of participants was Head nurse.

Table 4.1: Knowledge regard cardiac catheterization as a procedure

		Responses	
		N	**Percent**
What do you know about cardiac catheterization	Invasive, diagnostic, therapeutic	12	34.3%
	Diagnostic + therapeutic	7	20.0%
	Therapeutic + invasive + diagnostic	16	45.7%
Total		35	100.0%

This table show knowledge regard cardiac catheterization as a procedure 45.7% of participants were full knowledge and choose all possible answers, while 20% of them were moderate knowledge and choose 2 out of 3 possible answers, since 34.3% of them were less knowledge and choose 1 out of 3 possible answers .

Table 4.2: Type of cardiac catheterization

		Responses	
		N	**Percent**
type of cardiac catheterization	Diagnostic or therapeutic	9	25.7%
	therapeutic and diagnostic	25	71.4%
	I don’t know	1	2.9%
Total		35	100.0%

This table show that most 71.4% of participant were good knowledge about type of cardiac catheterization and choose all possible answers, since 25.7% of them were less knowledge and choose 1 out of 2 possible answers, and only 2.9% of them said that they don't know about cardiac catheterization.

Table 4.3: Type of anesthesia used for cardiac catheterization

		n	Percent
Valid	Local anesthesia	35	100.0

This table show that all participant were good knowledge about type of anesthesia used for cardiac catheterization with 100% said that it is local anesthesia.

Table 4.4: Artery for inserting cardiac catheterization

		Responses	
		N	Percent
arteries can insert cardiac catheterization in it	Femoral and radial	10	28.6%
	radial or femoral brachial	25 0	71.4%
Total		35	100.0%

This table show that 10 participants with 28.6% choose 2out of 3possible answers regard main artery for inserting cardiac catheterization, while 25 of them with 71.4% choose only 1out of 3possible answers regard main artery for inserting cardiac catheterization ,since no one choose all possible answers with 0% knowledge about brachial artery.

Table 4.5: Complication of cardiac catheterization

		Responses	
		N	Percent
complication of cardiac catheterization	Bleeding + hematoma +renal failure	3	8.6%
	Hematoma +bleeding	20	57.1 %
	Renal failure or hematoma or renal failure	12	34.3%
Total		35	100.0%

This table show that most 20 participants with 57.1% choose 2out of 3 possible answers regard complication of cardiac catheterization, while only 3 participants with 8.6% were good knowledge and choose all possible answers regard complication of cardiac catheterization, since 12 participants with 34.3% choose only one answer regard complication of cardiac catheterization.

Table 4.6: Peripheral vascular complication

		Responses	
		N	Percent
peripheral vascular complication	Hematoma + pseudo aneurysms +acute arterial occlusion	3	8.6%
	Hematoma or pseudo aneurysms or arterial occlusion	27	77.1%
	Hematoma and Acute arterial occlusion	1	2.9%
	I don’t know	4	11.4%
Total		35	100.0%

This table show that only 3participants with 8.6%were good knowledge regard peripheral vascular complication and choose all possible answers, while most 27 participants with 77.1% choose 1 out of 3 possible answers regard peripheral vascular complication and only one of them with 2.9% choose 2 out of 3 possible answers, since 4 participants said they don't know about peripheral vascular complication.

Table 4.7: Increasing of complication in elderly

		Frequency	Percent
Valid	Yes	32	91.4
	No	3	8.6
	Total	35	100.0

This table show that most 32 participants with 91.4% said that complication of cardiac catheterization is increased in elderly patients since only 3 participant with 8.6% said that complication of cardiac catheterization doesn't increase in elderly patients.

Table 4.8: Time of ambulation after cardiac catheterization

		Responses	
		N	**Percent**
when can start ambulation after Cardiac catheterization	90min or 3-4 h or 6 h	30	85.7%
	(3h - 4h and 6h) or (90min and 3-4h)	4	11.4%
	I don't know	1	2.9%
Total		35	100.0%

This table show that most 30 participants with 85.7%choose only 1 out of 3 possible answer regard time of ambulation after cardiac catheterization, while 4 participants with 11.4% were better knowledge and choose 2out of 3 possible answers regard time of ambulation after cardiac catheterization, since only one participant doesn't have knowledge regard time of ambulation after cardiac catheterization.

Table 4.9: Responsibility of sheath remove

		Frequency	**Percent**
Valid	Cardiac nurse	34	97.1
	Medical	1	2.9
	Total	35	100.0

This table show that most 34 participants with 97.1% choose the correct answer and said that the cardiac nurse is one who is responsible of removing of sheath while only 1 participant said it's medical's responsibility.

Table 4.10: Pressure over artery after sheath remove

		Frequency	**Percent**
Valid	YES	34	97.1
	NO	1	2.9
	Total	35	100.0

This table show that most 34 participants with 97.1% choose the correct answer and said that it is important to do pressure over artery after remove of sheath while only 1 participant said it is not important to do pressure.

Table 4.11: Time of sheath remove in patient with high blood pressure

		Frequency	**Percent**
Valid	At any time	4	11.4
	At immediately	1	2.9
	After stable and decrease blood pressure	29	82.9
	I don't know	1	2.9
	Total	35	100.0

This table show that most 29 participants with 82.9% have good knowledge and said in patient with high blood pressure sheath is removed after stable and decrease blood pressure, while 4 of them said it removed at any time, since only 1 of them said it removed immediately and only 1 participant don't have knowledge regard removing of sheath in patient with high blood pressure.

Table 4.12: Complication of sheath remove

		Responses	
		N	**Percent**
complication of sheath remove	(Hemorrhage +air embolism + thrombus formation)	4	11.4%
	(Air embolism + thrombus formation) or(hemorrhage +air embolism) or (thrombus + hemorrhage)	9	25.7%
	Hemorrhage or Thrombus formation or air embolism	21	60%
	I don't know	1	2.9%
Total		35	100.0%

This tables show only 4 of participant with 11.4%have good knowledge about complication of sheath remove while 9 of them with 25.7% have less knowledge and choose 2out of 3 possible answers, since most 21 of participant with 60% choose only 1out of 3 possible answers about complication of sheath remove

and only one participant doesn't have knowledge regard complication of sheath remove.

Table 4.13: Patient discharge after cardiac catheterization

		Responses	
		N	**Percent**
when patient discharge	4h	16	45.7%
	immediately after Cardiac catheter	5	14.3%
	90min	7	20.0%
	I don't know	7	20.0%
Total		35	100.0%

This table show that 16 participant with 45.7% said that patient is discharge after 4h of cardiac catheterization, while 5 participants with 14.3% said that patient is discharge immediately after cardiac catheterization, since 7 participants with 20% said that patient is discharge after 90 min of cardiac catheterization, and 7 participants don't have knowledge regard patients discharge.

Table 4.14: Health education for patient after discharge

		Responses	
		N	**Percent**
health education after discharge	Time of Medication + follow up+ nutrition	20	57.1%
	(follow up + time of medication)or (follow up + nutrition) or (nutrition + time of medication)	6	17.1%
	Nutrition or time of medication or follow up	9	25.7%
Total		35	100.0%

This table show that most 20 participants with 57.1% have good knowledge and choose all possible answers, while 6 of them choose 2 out of 3 possible answers with 17.1%, since 9 of them have less knowledge and choose only 1 out of the 3 possible answers with 25.7%.

Analysis of the results:

Table 1: The risk of bleeding and its relationship to educational level

Variables	**cumulative (R^2)**	**calculated t**	**P. Value**
Diploma	0.091	**4.525	0.604
Bachelor's degree	0.538	**4.106	
Master's	0.614	0.764	

** Statistically significant at the level of significance (α) (<0.05).

1. From the percentage of bachelor graduates in the qualification, we are assured that the distributors in the departments are qualified and fully aware of their interfaces.

Table 2: Walking time after cardiac catheterization

Variables	**cumulative (R^2)**	**calculated t**	**P. Value**
Diploma	0.392	1.032	0.486
Bachelor's degree	0.347	3.724	
Master's	0.292	2.611	

** Statistically significant at the level of significance (α) (<0.05).

2. Although the majority of the sample surveyed have a bachelor's degree, the walking time after cardiac catheterization did not succeed in answering the ideal, which confirms the need to train cadres and increase their qualification.

Table 3: Time to remove the sheath of a hypertensive patient:

Variables	**cumulative (R^2)**	**calculated t**	**P. Value**
It is removed after it settles	0.506	4.008	0.591
Remove it at any time	0.685	4.521	
Remove it immediately	0.647	5.432	

** Statistically significant at the level of significance (α) (<0.05).

3. Through the response of the respondents at the time of removing the sheath of the patient with high blood pressure, the majority of the research sample said that the patient with high blood pressure is removed after stabilization and low blood pressure, and this confirms the experience of the respondents in this aspect.

DISCUSSION

Though cardiac catheterization is considered the most relevant standardized protocol of diagnosis, evaluation, and treatment of many cardiovascular diseases, it may lead to several minor and serious complications which may lead to morbidity and mortality Nurses need to advance their knowledge and evidence based practice when providing care for patients after cardiac catheterization (Ahmed, 2015).

Regarding to Socio demographic data, the present study showed that the mean age of the sample was in ranged between (20-30) years old. This result disagreed with Ali *et al.*, (2015) who studied nurses' knowledge and practice regarding implantable device in Egypt and found that most of the participants were aged between 31 and 35 years old, but these findings agreed with Al-Ftlawy (2014) who studied nurses' knowledge toward care provided to patients with acute myocardial infarction in Al-Najaf City and found that 49% of the age group was (23-27) years old.

Regarding the gender, the present studyrevealed that highest percentage (68.6%) of the study sample were female and remaining (31.4%) were male. This results disagreed with the finding of Al-Ftlawy (2014) who concluded that the majority of study nurses were male but agreed with the finding of Parajulee and Selvaraj (2011) and Ali *et al.*, (2015) showed in their studies most nurses were female gender Regarding to educational level the majority of sample had bachelor degree of nursing. This result agreed with Ali *et al*., (2015) who studied nurses' knowledge and practice regarding implantable device in Egypt and found majority of the sample had bachelor of nursing, but disagreed with Abudahi, Fekry, & Abdelwahab (2012) who revealed that the great majority of their studied samples were diploma nurse

Regarding to years of experience the majority of the sample ranged in between [1-5] years. this result agreed with Randa A (2017) who studied nurse's knowledge about patient's safety after cardiac catheterization in Sudan cardiac center and found 80% of the investigated participants had an experience of 5 years or less.

The majority of sample according to the place of work showed that (25.7%) of participants are working in the long stay. this disagreed with Randa A (2017).

Regarding to nurses' knowledge about cardiac catheterization procedure, the majority of sample showed that 45.7% of participants were good knowledge this is agreed with (Hadi, 2016) which found good knowledge about cardiac catheterization.

In relation to cardiac nurses' knowledge regarding post cardiac catheterization complications was assessed it found (34.3%) of the sample had poor knowledge, This result agreed with study of Ali *et al*., (2015) who studied nurses' knowledge and practice regarding implantable device in Egypt and revealed that the majority have an unsatisfactory knowledge level with the mean 20.927 ±3.696 out of 34 scores.

With regard to the knowledge about increasing risk for developing complication in elderly, nurses showed good knowledge (91.4%) this disagreed with Randa A (2017). Which found only 30% of nurses are knowledgeable about complication in elderly.

Regarding the knowledge of time for the patient to be kept immobilized, majority of the nurses 85.7% poor knowledge, this result disagreed with Randa (2017) which found good knowledge regard bed time.

The participants were assessed about their knowledge of the complications of delayed sheath removal and found were poor knowledge .this result disagreed with Randa A (2017) which found all participants have good knowledge about all complication of delayed sheath removal.

The study findings revealed that there were significant statistical differences among nurses' educational levels regarding knowledge as baccalaureate nurses had higher knowledge scores than diploma. This is reflected in Al-Ftlawy's (2014) study on nurses' knowledge towards care provided to patients with acute myocardial infarction in Al-Najaf City, which revealed a significant relationship between nurses' level of knowledge and education. Alternatively, the present study finding contradicts Thomas' (2013) findings which revealed that there was no significant association between knowledge scores and educational qualifications.

In this study which is conducted among nurses of Merowe Medical City Based on the finding of this study it was conclude that most nurses had good knowledge regarding cardiac catheterization, poor knowledge about cardiac catheterization complication, poor knowledge about time of ambulation and good knowledge about time of sheath removal.

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