

Radial Versus Femoral Access For Coronary Angiography or Intervention And The Effect on The Nurses, Patients And Relatives' Satisfaction

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Abstract: Trans-femoral approach for cardiac catheterization has typically been more prevalent. But, radial access has expanded in popularity due to lower complications rate. **Aim of the study:** Assess radial versus femoral access for coronary angiography or intervention and the effect on the nurses, patients and relatives' satisfaction. **Subjects and methods:** Descriptive design was utilized. The study was conducted in the Cardiac Catheterization Lab and Cardiology Department at Assiut University Hospital. All available nurses (30), in addition to (200) adult male and female patients, scheduled for coronary angiography or intervention and (200) members of their relatives. Patients were assigned into two groups (femoral and radial). Tools: Three structured interview questionnaire sheet were utilized for nurses, patients, and patients' relatives. **Results:** two third of nurses (66.7%) and the highest percentage of femoral and radial groups patients and their relatives (63% & 100% respectively) and (55% & 100% respectively) preferred and satisfied with the radial access than femoral access. Also, the largest percentage of femoral and radial groups patients and their relatives (100% & 74% respectively) and (81% & 51% respectively) had unsatisfactory level of knowledge about types of vascular access. **Conclusion:** The highest percentage of nurses, patients, and relatives preferred and satisfied with radial access than femoral access. The majority of the studied patients and their relatives had unsatisfactory level of knowledge about vascular access types. **Recommendations:** Equip the cardiac catheterization unit with simple illustrated guidelines cover vascular access types. Cardiologist should share nurses, patients, and relatives' opinions about vascular access types to maintain satisfaction and help in improving the quality of care.

Keywords: vascular access, coronary angiography, percutaneous coronary intervention, satisfaction and relatives.

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I. Introduction

Cardiac catheterization is a general term for some procedures. These procedures can be diagnostic or therapeutic. For example, coronary angiography is a diagnostic procedure that permits the cardiologist to visualize the coronary vessels. Percutaneous coronary intervention (PCI) however, includes the utilization of mechanical stents to increase blood flow to blocked vessels. Endovascular procedure could be performed through femoral artery, brachial artery or radial artery (Kern et al., 2016 & Kasper et al., 2015).

Trans-femoral approach is recognized to be the route of choice for coronary angiography. Contrarily, it carries a significant risk of access-site bleeding specially in elderly and obese patients. Also, retroperitoneal hemorrhage is a possible complication. Pseudo-aneurysms and hematomas at the access site are common and often painful complications of femoral access that considered less common with radial access (Askari et al., 2012). Trans-femoral approach requires the patient to tolerate a supine position for broadened time post procedure to achieve hemostasis. Trans-radial approach obviates the need for post procedural supine position and patients have the ability to ambulate immediately following the procedure (Abu-Fadel, 2016). Furthermore; Trans-radial approach has the possibility to decrease procedural expenses, fewer complications associated with shorter hospital stay, and less staffing is necessary to care for patients (Watson & Gorski, 2012).

Occlusion of radial artery is a possible complication with radial access which can limit future radial access and decrease utility of radial artery for hemodialysis or for coronary artery bypass, so efforts to avoid occlusion should be made. Hand ischemia is an extremely rare complication after trans-radial angiography (Butera et al., 2014).

Literature suggests that patients should be involved in a brief discussion with the cardiologist regarding the potential vascular access options. As vascular access is a preference-sensitive-decision this confuses comparing benefits and harms of procedure. So, incorporation of patient preferences, along with professional expertise, can provide directions for choosing procedural options and planning care services (DosReis et al., 2014). Patient satisfaction is used to measure outcomes of health care. Patient satisfaction is used as an indicator for guiding quality improvement projects in an organization (Press, 2008). Viewing the fact that nurses have a vital role in patients' experiences during hospitalization, satisfaction of patients with nursing care constitutes an important part of the overall satisfaction with the provided services (Han et al., 2003).

Families can have a role in patients' recovery. Patients get better faster when the family is happy with the services a patient is receiving, so patient and family satisfaction becomes a very important key in treatment and recovery. Availability of physicians for giving the information to the family in addition to efforts of nurses to provide understandable explanations will increase family satisfaction (Fumis et al., 2008).

Finally, it seems that recognizing the problems and the factors causing dissatisfaction among patients and their relatives is pivotal, which not only improves the quality of services, but also increases satisfaction and promotes knowledge. Also, nurses spend a lot of time with patients and families and they are in a proper position to assess their needs and satisfaction. Therefore, this study was conducted to assess nurses, patients, and relatives' satisfaction regarding types of vascular access.

Significance of the study

In Cardiac Catheterization Lab of Assiut University Hospital, 150 cases / week perform either diagnostic or interventional cardiac catheterization (Hospital record, 2017). The type of vascular access used is determined by physician only without participation from the nurses, patients, or relatives. Therefore, this study was the first study in this geographical location which assessed nurses, patients, and relatives' satisfaction regarding types of vascular access used. Additionally, study results may be useful for cardiologists during choosing vascular access route bearing in mind satisfaction of nurses, patients, and relatives.

Aim of the study: This study aimed to assess radial versus femoral access for coronary angiography or intervention and the effect on the nurses, patients and relatives' satisfaction.

Research question:

- 1- Which vascular access-route is more satisfying for nurses, patients, and relatives?
- 2- What is the level of patients and relatives' knowledge about types of vascular access?

Operational definition:

Vascular access: Coronary angiography with or without intervention is accomplished mainly with vascular access obtained via radial artery or femoral artery (Bertrand et al., 2010).

Coronary angiography: A procedure that permits x-ray examination of the heart and coronary arteries after injection of radiopaque substance (Kasper et al., 2015).

Percutaneous coronary intervention: A cardiac intervention in which the blocked artery is dilated, using a balloon catheter to flatten the plaque and open the vessel. (Pursnani et al., 2012).

Satisfaction: is conceptualized as an active optimization process between a person and environment. It is to fulfill the desires, expectations, needs, or demands of a person (Shin, 2016).

Relatives: First degree relative (father, mother, sister, brother, son, daughter, husband, and wife).

II. Subjects And Methods

Research design: Descriptive design was used for achieving the aim of the study.

Setting: The study was conducted in the Cardiac Catheterization Lab and Cardiology Department at Assiut University Hospital.

Sample: All available nurses (30) working in Cardiac Catheterization Lab at Assiut University Hospital. In addition to (200) adult male and female patients, aged from (18-65) years old, scheduled for coronary angiography or intervention, and (200) members of their relatives (one family member with each patient). Patients were assigned into two groups (femoral and radial).

The following criteria were used for patients' selection:

- Normal prothrombin time (10-14 seconds) (Urden et al., 2006)
- Normal renal function test (BUN is 5 to 25 mg/dl, creatinine is 0.5 to 1.5mg/dl) (Urden et al., 2006)
- Hemodynamically stable (without any complications).

Exclusion criteria:

- Patients having emergency coronary artery stent.

Tools: Data were collected, utilizing the following tools:

Tool I: Structured interview questionnaire sheet for nurses: This tool was designed by the researchers to assess nurses' preference and satisfaction regarding vascular access types. It included two parts:

Part 1: Demographic data of the nurses such as: age, gender, qualification, years of experience, marital status, and residence.

Part 2: Nurses' preference and satisfaction regarding vascular access types used in cardiac catheterization. It included 6 questions.

Tool II: Structured interview questionnaire sheet for patients: This tool was designed by the researchers to assess knowledge, preference and satisfaction of patients regarding vascular access types. It involved three parts:

Part 1: Patients' demographic data such as: age, gender, educational level..... etc.

Part 2: Knowledge of patients about vascular access types. Five list questions were involved, concerned with types of cardiac catheterization, ways to perform a cardiac catheterization, vascular access types, advantages, and harms.

Part 3: Preference and satisfaction of patients regarding vascular access types. It included 2 questions.

Tool III: Structured interview questionnaire sheet for patients' relatives: This tool was designed by the researchers to assess patients' relatives' knowledge, preference and satisfaction regarding vascular access types. It included three parts:

Part 1: Patient's relatives demographic data such as: age, gender, educational level, marital status, residence, and degree of relationship to the patient.

Part 2: Knowledge of patients' relatives about vascular access types. Five list questions were involved, concerned with types of cardiac catheterization, ways to perform cardiac catheterization, vascular access types, advantages, and harms.

Part 3: Patients' relatives' preference and satisfaction regarding vascular access types. It involved 3 questions.

Scoring system: Each question has three answers from 0:2

(0: if the answer is incorrect, 1: if the answer is incomplete correct, 2: if the answer is complete correct). Patients or relatives who got less than (50%) were considered having unsatisfactory level of knowledge, while patients or relatives who got more than (50%) were considered having satisfactory level of knowledge.

Method:

Administrative approval: An official permission was obtained from the responsible hospital authorities of the Catheterization Lab and Cardiology Department at Assiut University Hospital.

Tools content validity: Five experts (included 3 professors of Medical-Surgical Nursing and two professors of Cardiology) reviewed the tools for clarity, comprehensiveness, applicability, and easiness for administrative, minor modifications were required. Reliability was assessed by using Cronbach's test, the tools proved to be reliable (0.79).

Ethical consideration: The study was approved by the ethical committee of the faculty of nursing. An oral permission for voluntary participation was obtained from study subjects, after explaining the nature and purpose

the study. Study subjects were informed that they can participate or withdraw from this study without any rational. Confidentiality and anonymity were assured through data coding.

Pilot study: It was applied on (10%) of sample to test the applicability and clarity of the study tools. Analyses revealed that minimal modifications were needed. Modifications were done and the subjects who were included in the pilot study were excluded from this study.

Procedure:

1. Sampling was started and completed within 3 months from January 2017 to March 2017. This study was carried out at morning and afternoon shifts.
2. Nurses were visited by researchers in Catheterization Lab to start line of communication, clarify the purpose of the study and fill out tool (I). The number of sessions was 5 sessions for 5 weeks (1 session/week), every session contain 6 nurses in different times according to their work schedule. The detectable length of time of session was about 30 minutes.
3. Each patient and his/her relative involved in the study (femoral and radial groups) were interviewed by the investigators post cardiac catheterization in Cardiology Department before their discharge, to initiate line of communication, explain the purpose of this study and fill out tool (II and III). These continue for 3 months until the selected sample was finished.

Statistical design:

Data obtained and analyzed. Descriptive statistics were done through using computer program SPSS version (22). Results were interpreted to suit the research problem under investigation and were summarized in appropriate tables and charts. The following tests for significance were used, mean, standard deviation, and percentage. T-test for comparison of means.

III. Results

Table (1): This table shows that the mean age of nurses was (28.46 ± 6.52), the highest percentage of them was females (70%), married (76.7%), had 1- 5 years of experience (70%), and from rural areas (73.3%). As regarding nursing qualification less than half of them (43.3%) graduated from technical institute.

Table (2): This table demonstrates that two third of nurses (66.7%) prefer and satisfy with the radial access method because it is safer (70%) and less in complications after catheterization (70%). About three quarters of nurses (73.3%) mentioned that the femoral access requires a longer period of stay in the hospital so; bed occupancy rate was high and requires more nursing care (96.7%).

Table (3): This table reflects that the mean age of femoral and radial groups patients was (54.96 ± 9.09 and 49.60 ± 8.51 respectively), the highest percentages of them were males, married, and from rural areas, (73% and 61%), (50% and 100%), and (50% and 94%) respectively. Also, more than third of femoral group patients were from high school (38%) and most of them were literate (97%), while (50%) of radial group patients were illiterate and house wife (39%). As regarding types of procedure done more than half of femoral group patients and more than two thirds of radial group patients their type of procedure was coronary intervention (59% and 71% respectively).

Figure (1): This figure shows that all femoral group patients (100%) and the majority of radial group patients (74%) had unsatisfactory level of knowledge about vascular access types used in cardiac catheterization.

Table (4): This table demonstrates that the large percentage of femoral group patients and all radial group patients (63% and 100% respectively) preferred and satisfied with radial access than femoral access because of ease of movement individually.

Table (5): This table shows that the mean age of femoral and radial groups patients' relatives was (37.31 ± 10.09), the highest percentages of them were males and coming from rural areas (54% and 50%), and (50% and 94%) respectively. Also about third of femoral group patients' relatives have university education (35%) and about half of them were un-employed (51%), while (28%) of radial group patients' relatives were read and write and were employee (66%). As regarding degree of kinship about half of femoral group patients' relatives were daughter and son (49%), and about third of radial group patients' relatives were brother and sister (34%).

Figure (2): This figure reflects that the vast majority of femoral group patients' relatives (81%) and more than half of radial group patients' relatives (51%) had unsatisfactory level of knowledge about vascular access types used in cardiac catheterization.

Table (6): This table demonstrates that more than half of femoral group patients' relatives and all radial group patients' relatives (55% and 100% respectively) preferred and satisfied with radial access than femoral

access because of ease of movement individually, also, the majority of them considered the radial access is the better for their patients (77% and 100 respectively).

Table (7): This table shows a significant statistical difference ($P < 0.001$) between level of patients' knowledge about vascular access types and their level of education in both femoral and radial groups.

Table (8): This table shows that there was a significant statistical difference ($P < 0.001$) between level of patients' relatives knowledge about vascular access types and their level of education in both femoral and radial groups.

Table (1): Frequency distribution of demographic characteristics of nurses.

Variables	Nurses (n= 30)	
	NO.	%
Age in years:		
- 18 - 25	21	70.0
- 26 - 35	3	10.0
- 36 - 50	6	20.0
Mean±SD	28.46±6.52	
Gender:		
- Male	9	30.0
- Female	21	70.0
Marital status:		
- Single	7	23.3
- Married	23	76.7
- Divorced	0	0.0
- Widowed	0	0.0
Nursing Qualification:		
- Diploma nursing	12	40.0
- Technical institute	13	43.3
- Bachelor of nursing	5	16.7
Years of experience:		
- 1-5 years	21	70.0
- 5-10 years	6	20.0
- >10 years	3	10.0
Mean±SD	8.96 ± 7.53	
Residence:		
- Urban	8	26.7
- Rural	22	73.3

Table (2): Frequency distribution of nurses' satisfaction regarding radial versus femoral access for coronary angiography or intervention.

Variables	Nurses (n=30)			
	Radial access		Femoral access	
	No.	%	No.	%
- In your opinion, which of the two methods of vascular access are:	21	70.0	9	30.0
1. Safer for the patient?	8	26.7	22	73.3
2. Requires a longer period of stay in the hospital so, bed occupancy rate is high?	1	3.3	29	96.7
3. Requires more nursing care?	21	70.0	9	30.0
4. Less in complications after catheterization?	20	66.7	10	33.3
5. Which of the two methods of vascular access do you prefer and satisfy with?				
6. Why?	Ease of movement of the patient after cardiac catheterization individually, more safer, and early hospital discharge.			

Table (3): Frequency distribution of demographic characteristics of patients.

Variables	Patients with femoral access (n= 100)		Patients with radial access (n= 100)	
	NO.	%	NO.	%
Age in years:				
- 18- 25	0	0.0	0	0.0
- 26-35	4	4.0	11	11
- 36-50	19	19	42	42
- 51-65	77	77	47	47
Mean ±SD	54.96 ± 9.09		49.60 ± 8.51	
Gender:				
- Male	73	73	61	61
- Female	27	27	39	39
Marital status:				
- Single	50	50	0	0.0
- Married	50	50	100	100
- Divorced	0	0.0	0	0.0
- Widowed	0	0.0	0	0.0
Level of education:				
- Illiterate	26	26	50	50
- Reads and writes	15	15	12	12
- Basic education	21	21	7	7.0
- high school education	38	38	15	15
- University education	0	0.0	16	16
Occupation:				
- Employee	0	0.0	37	37
- Literal	97	97	10	10
- House wife	2	2.0	39	39
- Not work	1	1.0	14	14
Residence:				
- Urban	50	50	6	6.0
- Rural	50	50	94	94
Type of procedure done:				
- Diagnostic	41	41	29	29
- Intervention	59	59	71	71

Figure (1): level of satisfaction regarding knowledge about vascular access types used in cardiac catheterization among femoral and radial groups patients.

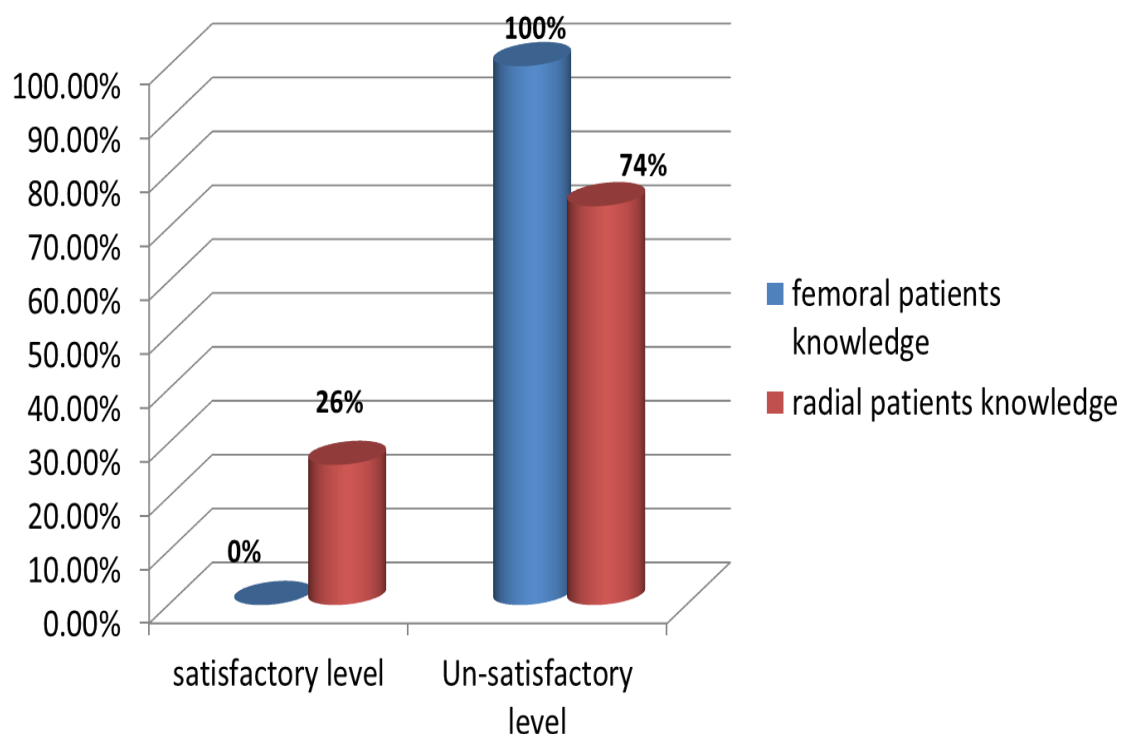


Table (4): Frequency distribution of patients' satisfaction regarding radial versus femoral access for coronary angiography or intervention among femoral and radial groups patients.

Items	Femoral group (n=100)				Radial group (n=100)			
	Radial access		Femoral access		Radial access		Femoral access	
	NO.	%	NO.	%	NO.	%	NO.	%
1. In your opinion, which of the two methods of vascular access do you prefer and satisfy with?	63	63	37	37	100	100	0	0.0
2. Why?	Ease of movement after cardiac catheterization.			Ease of movement after cardiac catheterization.				

Table (5): Frequency distribution of demographic characteristics of patients' relatives.

Variables	Relatives of patients with femoral access (n= 100)		Relatives of patients with radial access (n= 100)	
	NO.	%	NO.	%
Age in years:				
- 18--25	9	9.0	0	0.0
- 26-35	27	27	38	38
- 36-50	53	53	44	44
- 51-65	11	11	18	18
Mean ±SD	37.31±10.09		37.31±10.09	
Gender:				
- Male	54	54	50	50
- Female	46	46	50	50
Level of education:				
- Illiterate	10	10	20	20
- Read and write	18	18	28	28
- Basic education	10	10	0	0.0
- High school education	27	27	26	26
- University education	35	35	26	26
Occupation:				
- Employee	49	49	66	66
- Unemployed	51	51	34	34
Residence:				
- Urban	50	50	6	6.0
- Rural	50	50	94	94
Degree of kinship:				
- Wife or husband	10	10	24	24
- Brother or sister	23	23	34	34
- Daughter or son	49	49	33	33
- Father or mother	18	18	3	3.0
- Others	0	0.0	6	6.0

Figure (2): level of satisfaction regarding knowledge about vascular access types used in cardiac catheterization among femoral and radial groups patients' relatives.

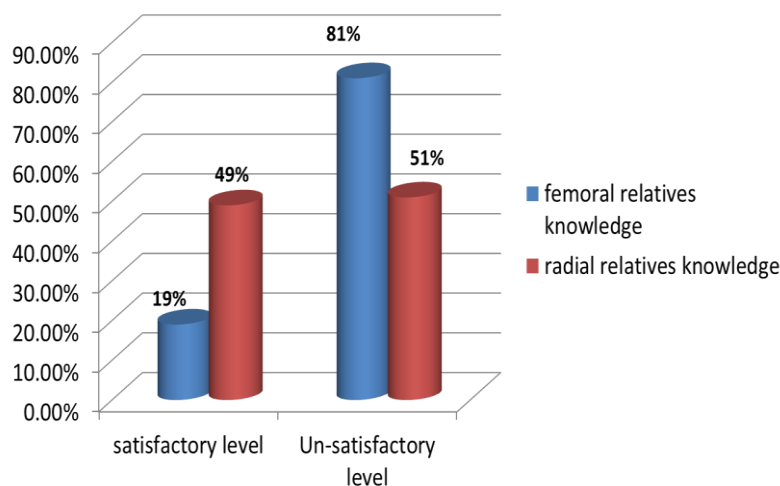


Table (6): Frequency distribution of patients relatives' satisfaction regarding radial versus femoral access for coronary angiography or intervention.

Items	Femoral group patients' relatives (n=100)				Radial group patients' relatives (n=100)			
	Radial access		Femoral access		Radial access		Femoral access	
	NO.	%	NO.	%	NO.	%	NO.	%
- In your opinion,								
1. Which do you prefer and satisfy with?	55	55	45	45	100	100	0	0.0
2. Which better for your patient?	77	77	23	23	100	100	0	0.0
3. Why?	Ease of movement after cardiac catheterization.			Ease of movement after cardiac catheterization.				

Table (7): Relation between level of education and level of knowledge satisfaction among femoral and radial groups patients.

Variables	Femoral group (n=100)						Radial group (n=100)					
	Illiteracy NO. (26)	Read and write NO. (15)	Basic education NO. (21)	High school NO. (38)	University education NO. (0)	P value	Illiteracy NO. (50)	Read and write NO. (12)	Basic education NO. (7)	High school education NO. (15)	University education NO. (16)	P- value
	%	%	%	%	%		%	%	%	%	%	
- Satisfactory level of knowledge	0.0	0.0	0.0	0.0	0.0		6.0	2.0	0.0	14	14	0.000
- Unsatisfactory level of knowledge	26	15	21	38	0.0	0.00	44	10	7.0	1	2.0	

Table (8): Relation between level of education and level of knowledge satisfaction among femoral and radial groups patients' relatives.

Variables	Femoral group patients' relatives (n=100)					P value	Radial group patients' relatives (n=100)					P- value
	Illiteracy NO. (10)	Read and write NO. (18)	Basic education NO. (10)	high school education NO. (27)	University education NO. (35)		Illiteracy NO. (20)	Read and write NO. (28)	Basic education NO. (0)	high school education NO. (26)	University education NO. (26)	
	%	%	%	%	%		%	%	%	%	%	
- Satisfactory level of knowledge	0.0	1.0	1.0	7.0	10	0.000	5.0	8.0	0.0	16	20	0.000
- Unsatisfactory level of knowledge	10	17	9.0	20	25		15	20	0.0	10	6.0	

IV. Discussion

The field of interventional cardiology has seen a dramatic increase in procedural success and declines in ischemic and bleeding complications. The search for a procedural approach to bleeding reduction coupled with the goal of improving patient comfort, has led to a renewed interest in radial artery access, as opposed to the traditional femoral artery access for coronary catheterization and intervention (Adler, 2014 & Dauerman, 2011). regarding demographic data the present study revealed that the largest percentages of the patients with femoral and radial access were in age group between (51 to 65) years and were males, this can be attributed to the higher exposure to life stress, and female hormones that protect female from coronary artery diseases (CAD). This agreed with Andrea et al. (2010) who found that the largest numbers of patients submitted to PCI were males and the mean age for them was 59.7 years. Also, Kral et al. (2014) found that the prevalence of coronary plaque was higher in men than women and that volume of plaque increased with age.

This study presented that half of patients with radial access and all patients with femoral access were married. This result from the researchers' opinion is due to the high level of daily life stressors on married patients than single one and that stress is one of the most aggravating factors for CAD. This finding supported by Basuny (2009) who reported that most of studied sample was married in his study about the effect of position changing post coronary angiography on patient's outcomes.

As regard nurses preference and satisfaction; the present study showed that the highest percentage of nurses preferred and satisfied with radial access than femoral access because of, ease of movement of the patients individually, safer, and early hospital discharge. From the researchers point of view nurses on the front line caring for patients before, during and after cardiac catheterization and they play a key role in the prevention of complications, so it will be better if the physicians take in consideration the nurses satisfaction which may be a factor that helps in improving the patient care.

Results of the current study demonstrated that the greatest percentage of nurses had seen that radial access less in complications than femoral access. This agreed with Jolly et al. (2009) who stated that radial approach decreased bleeding and the ischemic events compared to femoral approach, in their study about the effect of radial versus femoral rout for coronary angiography or intervention on bleeding and ischemic events. Also, Pandie et al. (2015) found that radial approach decreased major vascular complications compared with femoral approach.

The present study demonstrated that the majority of nurses informed that the femoral access requires a longer period of stay in the hospital and the rate of occupancy of bed is larger than radial access. These results were in the same line with Franchi et al. (2009) who showed that radial access yielded a trend toward a decreasing rate of local complications and a significant reduction in time to ambulation and time to discharge with respect to femoral access.

Regarding patients and relatives knowledge; the current study results showed that majority of patients and their relatives in both groups (femoral and radial) had unsatisfactory level of knowledge about types of vascular access used in cardiac catheterization. Also in comparison between both of them, relatives were more knowledgeable than their patients, this may be due to decrease the mean of relatives' ages and because of the

high percentage of them has university education, so they have a desire to learn new knowledge either through reading or through media.

In this regard Rao et al. (2010) stated that the usual patient-physician consultation about vascular access options should comprise a brief explanation on types, benefits and risks of arterial access options. DosReis et al. (2014) added that information exchange from patient to physician is valued as it may result in a more individualized care plan that increases the legitimacy and the accountability of the vascular decision.

Similarly, Reed et al. (2008) studied the effect of giving information to patients on their fear and satisfaction level. The findings showed a reduction in the patient level of anxiety pre cardiac catheterization through education. Also, Aiello and Morris (2003) added that patient satisfaction is positively related to nursing care which includes giving information to patients and families. If nurses cover patients' needs, patients and their families will be willing to be involved in decision-making.

As regard patients and relatives' preference and satisfaction; the present study illustrated that majority of patients and their relatives in both groups (femoral and radial) preferred and satisfied with radial access than femoral access. Perhaps this is because the cardiologists not taking into account the preferences and satisfaction of patients regarding their own treatment options and the incorporating of their choice into health care.

Congruent with the current study Cooper et al. (1999) conducted a comparative study about the effect of radial route on quality of life and cost. Results revealed that a significant amount of patients had a strong preference for radial catheterization than femoral. Also, according to a study of Jolly et al. (2011) the vast majority of patients who underwent the radial route, preferred the radial access, and more than half of those who underwent the femoral route, preferred the radial route too.

Fens (2015) disagreed with the results of the current study; he evaluated the patient preferences for vascular access by coronary angiography or intervention. The results revealed that patients were slightly in favor of the femoral approach than radial approach, except from those who experienced both vascular routes, as they were in favors of the radial approach.

V. Conclusion

Based on the results of the present study it can be concluded that the highest percentage of nurses, patients, and relatives preferred and satisfied with radial access than femoral access. The majority of the studied patients and their relatives had unsatisfactory level of knowledge regarding the difference between cardiac catheterization using femoral or radial access.

VI. Recommendations

- Equip the cardiac catheterization unit with simple illustrated guidelines cover vascular access types, advantages, and harms of each type.
- Cardiologist should share nurses, patients, and relative's opinions about vascular access type used during cardiac catheterization to maintain satisfaction and help in improving the quality of care.
- Further research studies about using the radial access more than femoral access due to the great benefits for the patients according to many studies in this regard.
- Further research studies on a larger sample acquired from different geographical areas in Egypt for generalization the results.

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