

Effectiveness of Nursing Intervention on Physiological Status for Patients Undergoing Coronary Catheterization

فاعلية التداخل التمريضي على الحالة الفسيولوجية للمرضى الخاضعين للقسطرة التاجية

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الخلاصة:

خلفية البحث: تتطلب الرعاية التمريضية للمرضى الذين يخضعون لقسطرة القلب كادر تمريضي خبير ومتخصص يفهم أنواع المضاعفات التي يمكن أن تحدث، وكذلك مهارات التقييم لاكتشافها. يهدف الجمع بين المعرفة والمهارات التمريضية خلال فترة ما قبل وبعد قسطرة القلب إلى ضمان عملية قسطرة آمنة ودقيقة، وكذلك لتحسين الصحة البدنية والعقلية.

الهدف: تهدف هذه الدراسة إلى ايجاد فاعلية التداخل التمريضي على الحالة الفسيولوجية للمرضى الخاضعين لقسطرة الشريان التاجي من خلال استخدام استمارة فحص المعلمات الفسيولوجية وهي (ضغط الدم الانقباضي / الانبساطي ، معدل ضربات القلب ، معدل التنفس ، و تشبع الاوكسجين).

المنهجية: أجريت دراسة سريرية عشوائية في مركز النجف لجراحة القلب والقسطرة القلبية ، وقد أجريت للفترة من خلال الفترة 14 \ حزيران \ 2019 إلى 29 \ كانون الثاني \ 2020. لقد تم بناء التداخل التمريضي والارشادات من قبل الباحث لغرض انجاز الدراسة. عينة الدراسة تكونت من (100) مريض تم إحالتهم لإجراء قسطرة الشرايين التاجية الاختيارية إلى مركز النجف لجراحة القلب وقسطرة القلب. خلال فترة الدراسة، تم اختيار المرضى من خلال عينة غرضية غير احتمالية وتم تقسيمهم عشوائيا إلى مجموعتين. المجموعة التجريبية تكونت من (50) مريض تخضعوا للتدخل التمريضي و المجموعة الضابطة تكونت ايضا من (50) مريض لم يخضعوا الى التدخل التمريضي. لقياس فاعلية التدخل التمريضي على المرضى الذين خضعوا لقسطرة الشرايين التاجية استخدم الباحث استمارة اختبار المعارف والتي تضمنت (10) فقرات. استمارة المعلمات الفسيولوجية تضمنت (4). تم تنظيم طرق جمع البيانات على النحو التالي: (أسلوب المقابلة ، والملاحظة لقياس المعلمات الفسيولوجية. تم تحديد ثبات اداة القياس من الاختبار وإعادة الاختبار وحددت المصادقية الاداة من خلال عرضها على مجموعة من الخبراء تتكون من (11) خبيراً. تم استخدام (الاحصاء الوصفي) التكرار ، النسب المئوية ، الوسط الحسابي ، الانحراف المعياري ، عرض الرسوم البيانية) ، وباستخدام الاحصاء الاستدلالي (الفا كروباخ ، مربع كاي، اختبار t مستقل ، اختبار t مقترن ، اختبار انوفا ، واختبار ذات الحدين).

النتائج: أظهرت نتائج الدراسة أن متوسط معدل الضغط الانقباضي والانبساطي ومعدل ضربات القلب في المجموعة التجريبية يعود إلى المستويات الطبيعية بعد قسطرة الشريان التاجي حتى الخروج من المستشفى؛ في حين تدهور معدل الانقباضي والانبساطي ومعدل ضربات القلب في المجموعة الضابطة بعد قسطرة الشريان التاجي حتى الخروج من المستشفى.

الاستنتاج: وجدت الدراسة أن المرضى في المجموعة التجريبية يعودون إلى طبيعتهم خلال فترة القياسات في حين تدهور المرضى في المجموعة الضابطة خلال فترة القياسات.

التوصيات: يجب استخدام إجراءات التمريض الموحدة لتوجيه لمرضى/المرضات في التعامل مع مرضى قسطرة الشرايين التاجية.

ABSTRACT:

Background: Nursing care for patients undergoing cardiac catheterization requires an expert nurse who understands the types of complications that can occur, as well as the assessment skills to spot them. The combination of nursing knowledge and skills during the period before and after cardiac catheterization aims to assure safe and accurate procedure, and improving physical and mental health.

Aim of the study: To evaluate the effectiveness of nursing intervention on the physiological status for patients undergoing coronary catheterization through utilization of physiological parameters check list such as (systolic/diastolic blood pressure, heart rate, respiratory rate, and O2 saturation).

Methodology: randomized clinical trial (RCT) was conducted for patients' undergoing coronary catheterization at Al Najaf Center for Cardiac Surgery and Cardiac Catheterization, the study has been carried out during the period 14 \ June \ 2019 to 29 \ January \ 2020. The sample consisted of (100) patients have been randomly divided into two groups of 50 patients each. The experimental group consisted of 50 patients who are exposing to nursing interventions by the researcher. The groups who have not to expose to nursing interventions by the researcher, are considering the control group. The instrument construction and consisted of three parts, (part I): the socio-demographic characteristics and comprised of (8) items, (part II): the clinical characteristics (part III): physiological parameters checklist for patients undergoing coronary catheterization (physiological parameters: a bedside monitor is used to measure (heart rate, respiratory rate, systolic blood pressure, diastolic blood pressure, and O2 saturation) for each patient .

Results: The result of present study demonstrated that the number of abnormal cases less in experimental group than control group related to the heart rate, respiratory rate, systolic blood pressure, diastolic blood pressure in the period of measurements.

Conclusions: The study stated that the patients in experimental group who receiving the nursing intervention had decrease in the (heart rate, and blood pressure) compared to the control group

Recommendations: standardized nursing procedures should be used to guide the nurses in dealing with patients with coronary catheterization, and the standards bill of for such practices should be created and presented to all ties in which such practices are performed.

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INTRODUCTION

Atherosclerosis produces discrete (confined) or scattered areas of blockage within a coronary artery. When the blockages are large enough, they reduce blood supply to heart muscle and produce ischemia. The tests used to make the diagnosis of coronary artery disease and its medical treatment have been discussed elsewhere ⁽¹⁾. Some patients with coronary artery disease may require surgery. Many patients with serious disease or those who fail on medical therapy are treated with a "needle hole" or "percutaneous" (through the skin) procedure that is performed in the cardiac catheterization laboratory ⁽²⁾. Coronary artery disease (CAD), which is also known as coronary heart disease (CHD), ischemic heart disease (IHD), and atherosclerotic heart disease, is the most common type of heart disease, (43% of total cardiovascular disease) and it is considered as the highest cause of death globally ⁽³⁾. This condition is caused by a build-up of plaque along the inner walls of the arteries of the heart, which reduces blood flow to the heart by narrowing or closing the arteries, resulting in various clinical symptoms, such as angina, arrhythmia, myocardial infarction, congestive heart failure, and even sudden cardiac death ⁽⁴⁾. Approximately 3 million cardiac catheterizations are coronary artery disease is one of the most common reasons of death all over the world ⁽⁵⁾. The Global Burden of Diseases (GBD) study (2016), reported the estimated mortality from coronary heart disease (CHD) in India at 1.6 million in the year 2000. Nearly 64 million cases of cardiovascular diseases (CVD) are likely in the year 2015, of which nearly 61 million would be CHD cases (the remaining would include stroke, rheumatic heart disease and congenital heart diseases). Deaths from this group of diseases are likely to amount to be a staggering 3.4 million ⁽⁶⁾.

Cardiac catheterization still presents potential risks, such as arrhythmias, embolism, neurologic alterations, and vasovagal changes, in addition to ischemic, allergic and vascular complications ⁽⁷⁾. In addition, the complications can include bleeding, infection, pain where the catheter was inserted, and damage to blood vessels. Other less common complications of the procedure include an arrhythmia, damage to the kidneys, blood clots, and heart attacks ⁽⁸⁾. Thus, in addressing the link with complications of cardiac catheterization are usually temporary and may include minor infections, bleeding, abnormal heartbeats, and reaction to medications or dye. There is also a possibility that more serious but rare problems may develop during the procedure. These major cardiac catheterization complications include heart, lung kidney, or brain problems ⁽⁹⁾. The advances in medical technology, with the development of hemodynamic studies and interventional and diagnostic techniques, the mortality rate of coronary heart diseases decreased significantly ⁽¹⁰⁾. It would be for this reason that cardiac nurses are responsible for providing patient's safety and minimizing complications after cardiac catheterization procedures. They should be aware about the guidelines for providing safety for the patient. Each nurse should know the high-risk patient, safe practices for handling and maintenance of homeostasis. Patient safety in minimizing complications is increasingly recognized as essential in practice of coronary care unit. Individual have right to safe and effective quality health care ⁽¹¹⁾. Nurses play a vital role in educating, preventing complications and managing the patient during and after the cardiac catheterization. Therefore, that nurses needs to have sound knowledge and competent skills to care for patients undergoing C.C. As patient's advocates and the primary care givers there should be a standardized education provided for the nurses to prevent complications, smooth and easy recovery and to reduce the hospital stay in patients ⁽¹²⁾. The objective of the this study was to evaluate the effectiveness of nursing intervention on the physiological status for patients undergoing coronary catheterization through utilization of physiological parameters check list such as (systolic/diastolic blood pressure, heart rate, respiratory rate, and O2 saturation).

AIM OF THE STUDY

To evaluate the effectiveness of nursing intervention on the physiological status for patients undergoing coronary catheterization through utilization of physiological parameters check list such as (systolic/diastolic blood pressure, heart rate, respiratory rate, and O₂ saturation).

METHODOLOGY

To achieve the aims of this study, this randomized clinical trial (RCT) was conducted for patients' undergoing coronary catheterization at Al Najaf Center for Cardiac Surgery and Cardiac Catheterization, the study has been carried out during the period 14\ June\ 2019 to 29\ January\ 2020. Al-Najaf Center for Cardiac Surgery and Cardiac Catheterization was the designated site for data collection. The sample consisted of (100) patients has been randomly divided into two groups of 50 patients each. The experimental group consisted of 50 patients who are exposed to nursing interventions by the researcher. The group that who has not to expose to nursing interventions by the researcher, is considered the control group. The specific criteria for including patients undergoing coronary catheterization, (1) Patients who underwent elective diagnostic cardiac catheterization for the first time, (2) Sheath size 6 French (2mm). (3) No history of diabetes associated with sensory problems, on the risk of peripheral arterial disease. (4) No history of back pain, (5) no history of urination discomfort and (6) free from any psychiatric disease.

Exclusion Criteria: (1) Patients who use Anticoagulant within (24) hours prior to the procedure, (2) impaired skin integrity at the access site, (3) Patients with diastolic or systolic blood pressure higher than (100) and (180) (mmHg), (4) Patients with complications and need for cardio-pulmonary resuscitation during cardiac catheterization, (5) Patients with a history of coagulation and bleeding diseases, and (6) Patients with emergency angiography and / or with Percutaneous coronary intervention during the period of the study.

The steps of the study: consisted of the following steps: (first step): the construction of nursing intervention the nursing intervention designed based on the results of patients' needs assessment, information gained from reviewing that relative scientific literature, previous studies, and researcher experiences. The contents of the nursing intervention were evaluated by experts in different field, second step the instrument construction, (part I): socio-demographic characteristics for patients undergoing coronary angiography which is comprised of (8) items including such as (gender, age, level of education ,occupation, household monthly, marital status, smoking status, number of years of smoking and alcohol status). (Part II): clinical characteristics for patients undergoing coronary angiography which include past medical history including (Hypertensive, diabetic, IHD), and past medication history which include (anti-platelets, anticoagulation, analgesia agent, anti-hypertension, vasodilator. (part III): physiological parameters checklist for patients undergoing coronary catheterization (physiological parameters: a bedside monitor is used to measure (heart rate, respiratory rate, systolic blood pressure, diastolic blood pressure, and O₂ saturation) for each patient.

The researcher check physiological parameter for both experimental and control groups and measured at CCU and medical wards; which are applied on the 24 hours before the coronary catheterization, post procedure (1-2 hours, 3-4 hours, 5-6 hours, and pre discharge from the center. Time for checking each patients' physiological parameters about (10-15) minutes, the statistical data analysis approach includes the measurements of the following: (Frequencies, Percentages, mean of score (M.S) with their standard deviation (S.D). ANOVA test (analysis of variance) is used to compare multiple (three or more) samples with a single

test; binominal test for testing the different of distribution of the observed frequencies of two categories nominal scale and their non-restricted of an expected outcome at 50%).

RESULTS:

Table (1): Distribution of Socio-Demographic Characteristic for both Experimental and Control Groups

Variables	Groups	Experimental		Control		P-value C.S.
		Freq.	%	Freq.	%	
Gender	Male	36	72	38	76	Binomial Test P = 0.276 NS
	Female	14	28	12	24	
	Total	50		50		
Age Groups	30-39	0	0	1	2	$\chi^2= 6.302$ P = 0.613 NS
	40-49	8	16	9	18	
	50-59	28	56	15	30	
	60-69	10	20	17	34	
	70-79	4	8	8	16	
	Total	50		50		
	$\bar{x} \mp S.D.$	55.3 $\mp$ 1.02		61.5 $\mp$ 1.52		
Education level	Illiterate	12	24	8	16	$\chi^2= 16.362$ P = 0.175 NS
	Read&write	6	12	4	8	
	Primary school	7	14	14	28	
	Intermediate school	7	14	10	20	
	Secondary school	4	8	3	6	
	Institute graduate	2	4	2	4	
	University graduate	12	24	9	18	
	Total	50		50		
Occupation	Housewife	15	30	12	24	$\chi^2= 8.196$ P = 0.085 NS
	Self-Employee	21	42	28	56	
	Retired	7	14	7	14	
	Governmental Employee	7	14	3	6	
	Total	50		50		
Marital status	Single	0	0	1	2	$\chi^2= 1.457$ P = 0.962 NS
	Married	46	92	48	96	
	Widowed	3	6	0	0	
	Divorced	1	2	1	2	
	Total	50		50		
Household monthly income	Less than 300,000	0	0	1	2	$\chi^2= 7.572$ p-value = 0.304 NS
	300,000-600,000	7	14	9	18	
	601.000-900.000	26	52	15	30	

	901.000-1.200.000	10	20	17	34	
	1.201.000-1.500.000	4	8	8	16	
	1,501.000 or more	3	6	0	0	
	Total	50		50		
Smoking	None	21	42	23	46	$\chi^2= 3.787$ $p = 0.436$ NS
	Active	26	52	27	54	
	Passive	3	6	0	0	
Smoking duration / years	6-10	2	4	1	2	$\chi^2= 3.158$ $p = 0.206$ NS
	11-15	6	12	10	20	
	16-20	5	10	4	8	
	20 and more	16	32	12	24	
Alcohol	Drinking	7	14	0	0	Binomial p-value = 0.607 NS
	No-drinking	43	86	50	100	

(%) = percentage, freq. = frequency, χ^2 = chi-square value, p- value= probability value, NS= non-significance.

Table (1) presented that 36 (72%) of patients in the experimental group and 38 (76%) in the control group were male. On the other hand, table (4.1) showed that 28 (56%) of patients in the experimental group and 15 (30%) in the control group with age group (50-59) years, with mean age for the experimental group was (55.3±1.02), and mean age for the control group was (61.5 ±1.52). Regarding educational level, the table (4.1) demonstrated that 12 (24%) in the experimental group and 8 (16%) in the control group were illiterate. In addition to, the table demonstrated 21 (42%) in experimental group and 28 (56%) in control group were self-employee. Concerning marital status; the majority of the patients in the experimental and control groups 46 (92%), 48(96%) were married. Regarding smoking; more than half of the patients 26 (52%) in experimental group and 27 (54%) in control group have active smoking. The majority of patients 43(86%) non-drinking alcohol in experimental group and the entire patient in control group 50 (100) were non-drinking alcohol.

Table (2): The Distribution of the Clinical Characteristic for both Experimental and Control Groups

Variables	Rating	Study		Control		P-value C.S.
		Freq.	%	Freq.	%	
Hypertensive	No	12	24	16	32	Binomial p-value = 0.61 NS
	Yes	38	76	34	68	
	Total	50		50		
Diabetic	No	13	26	20	40	Binomial p-value = 0.092 NS
	Yes	37	74	30	60	
	Total	50		50		
Ischemic Heart Disease	No	31	62	39	78	Binomial p-value = 0.12 NS
	Yes	19	38	11	22	
	Total	50		50		
	Blood thinner					

Past Medication History	(Anti-Platelet drugs, Anticoagulants)	42	84	36	72	$\chi^2= 4.58$ p = 0.126 NS
	Analgesic Agent	13	26	7	14	
	Sedative Agent	47	94	48	96	
	Anti-hypertension	38	76	34	68	
	Vasodilator	8	16	14	28	

(%) = percentage, freq. = frequency, χ^2 = chi square value, p- value= probability value, NS= non-significance

Table (2) demonstrated that 38 (76%) patients of experimental group and 34 (68%) patients in control group had hypertension, while (74%) of experimental group patients and, (60%) of control group patient with diabetes mellitus. In addition to 19 (38%) of patients in experimental group and, 11 (22%) of patients in control group had ischemic heart disease. Concerning past medications history, the majority of experimental and control groups 42 (84%), 36 (72%) using blood thinner, while (94%) of patients in experimental group and (96%) of patients in control group were use the sedative agent. Related the anti-hypertensive 38 (76%) of patients in the experimental group and 34 (68%) patients in control group used anti-hypertensive.

Table (3): Mean Difference (ANOVA) between The Patients' Physiological Parameters (Vital Signs) for Experimental

Parameters	Periods of measurement	Experimental group			
		Mean	Std. Deviation	F	p-value
Heart rate Beat / minute	1-2 hrs.	61.08	10.05	58.15	.0001 HS
	3-4 hrs.	80.26	5.89		
	5-6 hrs.	75.66	4.66		
	pre-discharge	77.42	9.72		
	Total	73.60	10.83		
Respiratory rate Breath /minute	1-2 hrs.	14.14	1.65	100.69	.0001 HS
	3-4 hrs.	18.94	0.42		
	5-6 hrs.	18.56	2.39		
	pre-discharge	19.12	1.611		
	Total	17.69	2.65		
Systolic blood pressure Mm/hg	1-2 hrs.	120.46	7.78	8.13	.0001 HS
	3-4 hrs.	120.48	4.67		
	5-6 hrs.	123.62	2.63		
	pre-discharge	124.26	3.30		
	Total	122.20	5.27		
Diastolic blood pressure Mm/Hg	1-2 hrs.	78.96	5.96	15.9	.0001 HS
	3-4 hrs.	85.04	3.84		
	5-6 hrs.	82.18	3.41		
	pre-discharge	83.52	4.68		
	Total	82.42	5.07		
Oxygen Saturation	1-2 hrs.	96.40	12.54	.734	.533

	3-4 hrs.	97.90	1.32		NS
	5-6 hrs.	98.12	1.31		
	pre-discharge	97.70	1.34		
	Total	97.53	6.36		

(%) = percentage, freq. =frequency, p-value= probability, F= fisher value NS= non-significance, HS= high significance, hrs. =hour

Table (3) illustrated that there was significant difference between period of measurements of (heart rate, respiratory rate, systolic blood pressure, and diastolic blood pressure) at p-value (0.05) (i.e. the mean difference indicated that the vital signs in experimental group return to normal levels after the procedure until discharge.

Table (4): Mean Difference (ANOVA) between The Patients' Physiological Parameters (Vital Signs) for Control groups

Parameters	Periods of measurement	Control group			
		Mean	Std. Deviation	F	p-value
Heart rate Beat / minute	1-2 hrs.	59.90	10.88	28.12	.0001 HS
	3-4 hrs.	76.40	16.27		
	5-6 hrs.	73.94	14.45		
	pre-discharge	84.74	12.87		
	Total	73.74	16.33		
Respiratory rate Breath /minute	1-2 hrs.	13.84	1.788	21.691	.0001 HS
	3-4 hrs.	17.88	3.95		
	5-6 hrs.	18.72	4.67		
	pre-discharge	19.34	3.98		
	Total	17.44	4.30		
Systolic blood pressure Mm/hg	1-2 hrs.	119.76	14.94	4.656	.004 HS
	3-4 hrs.	119.20	11.48		
	5-6 hrs.	120.34	10.18		
	pre-discharge	126.98	10.44		
	Total	121.57	12.24		
Diastolic blood pressure Mm/Hg	1-2 hrs.	77.76	8.27	11.939	.0001 HS
	3-4 hrs.	83.64	9.11		
	5-6 hrs.	80.84	6.07		
	pre-discharge	86.74	7.65		
	Total	82.24	8.48		
Oxygen Saturation	1-2 hrs.	96.80	1.85	4.918	0.003 HS
	3-4 hrs.	97.30	1.82		
	5-6 hrs.	98.06	1.64		
	pre-discharge	97.74	1.65		
	Total	97.47	1.79		

(%) = percentage, freq. =frequency, p-value= probability, F= fisher value NS= non-significance, HS= high significance, hrs. =hour

Table (4) showed that there was highly significant difference between period of measurements of heart rate, systolic blood pressure, and diastolic blood pressure at p-value (0.05) (i.e. the mean difference indicated that the vital signs in control group deteriorated to abnormal levels after the procedure until discharge.

Table (5): Assessment of Patients' Physiological Parameters at Period of Measurements for both Experimental and Control groups

Physiological parameters	Intervals	Statistics	Groups									
			Exprmtl	ctrl	Exprmtl	ctrl	Exprmtl	ctrl	Exprmtl	ctrl	Exprmtl	ctrl
			Pre-test		1-2 hours		3-4 hours		5-6 hours		Before discharge	
Heart rate	Between 60-100	Freq.	37	42	46	31	49	40	49	46	50	41
		%	74.0%	84.0%	92.0%	62.0%	98.0%	80.0%	98.0%	92.0%	100.0%	82.0%
	More than 100	Freq.	13	8	1	3	1	2	1	2	0	2
		%	26.0%	16.0%	2.0%	6.0%	2.0%	4.0%	2.0%	4.0%	.0%	4.0%
	Less than 60	Freq.	0	0	3	16	0	8	0	2	0	7
		%	0.0%	0.0%	6.0%	32.0%	.0%	16.0%	.0%	4.0%	.0%	14.0%
Respiratory rate	Between 14-24	Freq.	34	48	48	47	49	48	48	48	49	48
		%	68.0%	96.0%	96.0%	94.0%	98.0%	96.0%	96.0%	96.0%	98.0%	96.0%
	More than 24	Freq.	11	1	2	1	1	0	2	1	1	1
		%	22.0%	2.0%	4.0%	2.0%	2.0%	.0%	4.0%	2.0%	2.0%	2.0%
	Less than 14	Freq.	5	1	0	2	0	2	0	1	0	1
		%	10.0%	2.0%	.0%	4.0%	.0%	4.0%	.0%	2.0%	.0%	2.0%
Systolic blood pressure	Between 120-129	Freq.	28	32	41	20	45	26	46	32	46	31
		%	56.0%	64.0%	82.0%	40.0%	90.0%	52.0%	92.0%	64.0%	92.0%	62.0%
	More than 129	Freq.	17	18	4	14	5	13	4	12	2	12
		%	34.0%	36.0%	8.0%	28.0%	10.0%	26.0%	8.0%	24.0%	4.0%	24.0%
	Less than 120	Freq.	5	0	5	16	0	11	0	6	2	7
		%	10.0%	.0%	10.0%	32.0%	.0%	22.0%	.0%	12.0%	4.0%	14.0%
Diastolic blood pressure	Between 80-89	Freq.	31	40	39	27	45	33	46	39	45	36
		%	62.0%	80.0%	78.0%	54.0%	90.0%	66.0%	92.0%	78.0%	90.0%	72.0%
	More than 89	Freq.	11	8	2	6	3	6	2	5	1	6
		%	22.0%	16.0%	4.0%	12.0%	6.0%	12.0%	4.0%	10.0%	2.0%	12.0%
	Less than 80	Freq.	8	2	9	17	2	11	2	6	4	8
		%	16.0%	4.0%	18.0%	34.0%	4.0%	22.0%	4.0%	12.0%	8.0%	16.0%
O2 saturation	Between 94-100	Freq.	50	49	50	49	50	49	50	49	50	49
		%	100.0%	98.0%	100.0%	98.0%	100.0%	98.0%	100.0%	98.0%	100.0%	98.0%

	Less than 90%	Freq.	0	1	0	1	0	1	0	1	0	1
		%	.0%	2.0%	.0%	2.0%	.0%	2.0%	.0%	2.0%	.0%	2.0%

(%) = percentage, freq. =frequency.

Table (5) showed that the number of abnormal cases in experimental and control groups related to the heart rate in the period of measurements respectively were (13, 4, 1, 1, 0) and (8, 19, 10, 4, 9), Related to respiratory rate respectively were (16, 2, 1, 2, 1) and (2, 3, 2, 2, 2), related to systolic blood pressure respectively were (22, 9, 5, 4, 4) and (18, 30, 24, 18, 19), related to diastolic blood pressure respectively were (19, 11, 5, 4, 5) and (10, 23, 17, 11, 14), and related to oxygen saturation respectively were (0, 0, 0, 0, 0) and (1, 1, 1, 1, 1).

DISCUSSION

Coronary catheterization is a common interventional diagnostic procedure used in patients with (ACS). It can cause several complications that have to be identified and treated after the test. Taking into account possible complications, nurse's pays close attention to their patients after CC.

The result of present study demonstrated that the number of abnormal cases less in experimental group than control group related to the heart rate, respiratory rate, systolic blood pressure, diastolic blood pressure in the period of measurements (table 5). Also; the research finding of present study illustrated; there was significant difference between period of measurements of (heart rate, respiratory rate, systolic blood pressure, and diastolic blood pressure) at p-value (0.05) in experimental group (i.e. the mean difference indicated that the vital signs in experimental group return to normal levels after the procedure until discharge) (table 3). While regrinding the control group there was significant difference between period of measurements of heart rate, systolic blood pressure, and diastolic blood pressure at p-value, (0.05) (i.e. the mean difference indicated that the vital signs in control group deteriorated to abnormal levels after the procedure until discharge) (table 4). Goudarzi et al., (2018) mentioned that there were significant differences between interventional group patients' parameter patients and control group patients' parameter patients' pre and post cardiac catheterization. The result confirming with a study done by Tahmasbi and Hasanino, (2016) stated; that the Comparison of the (heart rate, respiratory rate, systolic and diastolic blood pressure) before and after the intervention was indicative of significant differences in patients of the interventional group ($P < 0.0001$)⁽¹³⁾.

Forooghy et al., (2015) reported that, before the intervention, the study groups did not differ significantly regarding hemodynamic parameters ($P > 0.05$), confirming the similarity of the groups before the study. Moreover, the study groups did not differ significantly in terms of hemodynamic parameters at different measurement time-points⁽¹⁴⁾. This study result came Compatible to present study result. A study done in Iran to evaluate the "Effects of a Multimodal Preparation Package on Vital Signs of Patients Waiting for Coronary Angiography" by Hajbaghery et al., (2014) the study finding shows non-significant difference was observed between the mean of SBP in the intervention and control groups one day before the angiography ($P = 0.82$). However, a significant difference was found between the mean of SBP in the intervention and control group at 30 minutes before angiography, with values of 123.36 mmHg and 128.85 mmHg in the intervention and the control group, respectively ($P = 0.03$). Also, a significant difference was observed between the mean of SBP in the two groups 30 minutes after the procedure, with values of 126.45 mmHg in the intervention group and 132.85 mmHg for the control group ($P = 0.03$)⁽¹⁵⁾.

Iranian study done by Jamshidi et al., (2013) their study result revealed that the experimental group showed a statistically significant decrease in the heart rate and blood pressure after the educational intervention compared to the control group. The patients in the

experimental group had significantly higher levels of comfort, satisfaction, and tolerability than the control group ($P < .001$)⁽¹⁶⁾. Finding is in contrast to that of Adaryani et al., (2009) who showed that mean arterial pressure and heart rate at 6 and 8 h after catheterization were significantly higher in the control group than those in the intervention groups. The researcher confirm that the patients in (experimental group) who received nursing intervention had decreased in heart rate and blood pressure after instructional activity, and nursing intervention compared to (control group)⁽¹⁷⁾. Patients who wait for coronary angiography are often worried and anxious. They experience significant negative emotions before the procedure, which may lead to an increase in blood pressure, heart rate and respiratory rate, in the other meaning; the difference in physical parameters between pre and post procedure for interventional group due the efficacy of interventional program and decrease in the post procedure anxiety level. Further, the change in the physical parameters for control group was related to decrease in patients' knowledge and the anxiety level.

CONCLUSION

The patients in experimental group who are receiving the nursing intervention had decrease in the (heart rate, and blood pressure) compared to the control group.

RECOMMENDATION:

1. The study that the replication of the study on a larger probability sample selected from different geographical areas in Iraq is recommend to obtain more generalizable data, and make a database for furthers researchers.
2. Standardized nursing procedures should be using to guide the nurses in dealing with patients with coronary catheterization.
3. The standards bill of for such practices should be created and presented to all ties in which such practices are performed.

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