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RESEARCH ARTICLE

Effectiveness of an Instructional program on patients' knowledge about exercises to prevent coronary artery disease progression after percutaneous coronary intervention (PCI)

Halla fadhel Abdul-Ameer[1], Khalida Mohammed Khuder[2] *

1. *Ministry of Health, Wasit health directorate, Iraq;*
2. *Department of Adult Nursing, College of Nursing, University of Baghdad, City of Baghdad, Iraq.*

Corresponding author: Halla fadhel Abdul- Ameer
Email: hala.fadhel1202a@conursing.uobaghdad.edu.iq

ABSTRACT
Pre-experimental design (one group pretest-posttest) A non-probability (purposive) sample of 35 patients who have coronary artery disease and are being treated with percutaneous coronary intervention to manage coronary artery occlusions. The study started from November 2021 to May 2022.The data was collected using sociodemographic, the clinical characteristics of the client, and the Coronary Artery Disease Education Questionnaire Short Version (CADE-SV), and lifestyle compliance items after PCI: Physical activity. The collected data were statistically analyzed using SPSS software version 26. The study result revealed that the majority of CAD patients are males with age 48 and above, married, secondary school graduates, and housewives. More than half of the study sample had risk factors for coronary artery disease, except for the patient's own smoking. Patients with coronary artery disease had a low degree of knowledge about healthy lifestyles before beginning the program, and significant improvement in patients' knowledge regarding healthy lifestyles after giving the program also presented a significant difference in all items about physical activity for patients with percutaneous coronary intervention. The finding presented that there were significant differences in post-test knowledge of all items about physical activity for patients with percutaneous coronary intervention after completing the program. There is a need to instruct patients following PCI by offering pamphlets, books, and brochures about healthy lifestyle aspects (especially exercise). Conducting a relatively large nursing health education program for patients after PCI to see how the program affects patients' understanding of healthy lifestyles. Also, suggest that all CHD patients have a full understanding and practice of exercise.

Keywords: *Exercise, Coronary artery disease, Exercise, Coronary artery disease, percutaneous coronary intervention.*

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INTRODUCTION

Coronary heart disease (CHD) is the greatest cause of death worldwide, with more people dying each year from it than from any other cause. Patients with CHD have a higher risk of recurrent heart attacks and mortality. People who have had a stroke have a 4-6 times greater chance of dying abruptly, according to various studies. CHD had been an issue for a long time. Controlling CHD Risk factors will lower the number of hospital admissions. Patients' quality of life will be improved, as well (WHO, 2017).

Percutaneous coronary intervention (PCI) is a frequent interventional procedure used to treat CHD. This procedure can widen a stenotic or occluded coronary artery, alleviate clinical symptoms, and effectively save the patient's life (Tamburino et al., 2010; Higami et al., 2015). ISR is a tough challenge in PCI-based CHD treatment, as well as a hotspot and difficult area of the current study. The etiology of ISR following PCI is not well known at this time. According to a recent study, the putative pathogenic mechanism is vascular intimal growth and infiltration of local inflammatory cells (Buccheri et al., 2016). "Neoatherosclerosis" is the name given to a novel type of atherosclerotic process.

In-stent restenosis (ISR) after PCI has steadily gained clinical attention (Murata et al, 2018)[5].ISR refers to plaque that is within 5 mm of the stent's edge after PCI and has stenosis of more than 50%. ISR occurs 15–30% of the time with stents (Alfonso et al., 2018). The widespread use of drug-eluting stents and anti-proliferative medications such as rapamycin, everolimus, and other anti-proliferative agents has increased the success rate of interventional therapy, but the ISR problem has not been totally cured. As a result, identifying ISR-related risk variables is critical in order to give evidence for ISR prevention. We sought to assess the qualities as well as the risk (Picard et al, 2017).

Stent thrombosis (ST) is a very dangerous clinical incidence that often progresses to ST-elevation myocardial infarction in the vast majority of instances, fatality rates are high. up to 20%–40% (Schulz et al., 2009). However a, comprehensive discussion of ST care most ST databases state that thrombus extraction and balloon angiography are frequently used, with repeated stenting in 30–50% of patients (Kimura et al., 2010).

Decades of research have looked at the function and efficacy of educational interventions in improving a patient's understanding of and ability to manage CAD risk factors. Patient education advocates in primary care have advocated a shift away from a basic approach to improving patient health status through information and toward "high-quality health education." With the purpose of assisting the patient in taking ownership of their personal health and welfare, a formal and well-organized mode of delivery has become the ideal design of an educational approach. Reduced healthcare costs and enhanced wellness outcomes are also desirable results of a successful teaching strategy. Previous research has looked at the effects of educational intervention on knowledge and health (Guzek et al., 2019).

Weight loss and improved physical exercise are the foundations of treatment for high triglyceride levels. Regular, moderate physical exercise raises high-density lipoprotein (HDL) levels while lowering triglyceride levels, lowering the risk of coronary events and overall mortality. Most individual adults should do at least 150 minutes of moderate-intensity aerobic activity per week and 75 minutes of vigorous-intensity aerobic activity per week. They should also do muscle- strengthening activities that train all major muscle groups two or more days per week. (CDC, 2015).

METHOD

Pre-experimental design (one group pretest-posttest). The study was conducted in the cardiac catheterization unit at Al-Zahraa teaching hospital in AL-Kut City. This study started from November 2021 to May 2022 after getting approval from the hospital. A non-probability (purposive) sample of 35 patients who have coronary artery disease and are being treated with percutaneous coronary intervention to manage coronary artery occlusions. The data was collected using sociodemographic, the clinical characteristics of the client, Coronary Artery Disease Education Questionnaire Short Version (CADE-SV), and lifestyle compliance items after PCI: Physical activity A self-administered questionnaire was created, and by using structured interviews for the clients that not able to read and write.

Section 1: Demographics: Section 1 Had questions regarding the socio-demographics of the participants including age, gender, marital status, level of education, and occupation.

Section 2: Clinical Characteristics of the participants: It consists of five variables, which include; body mass index, hypertension history, diabetes mellitus history, hyperlipidemia history, and smoking history.

Section 3: the Coronary Artery Disease Education Questionnaire Short Version (CADE-SV) which comprised 16 items.

Scoring for (CADE-SV) assessed by Yes=3, not sure =2, No=1

Section 4: lifestyle compliance items after PCI: Physical activity: comprised of 5 items.

Physical activity domain scored as follows: light (less than 3), neutral (3-5), strong (5-7)

RESULTS

Table (4.1.) presented that 77.1 percent of the study sample were within age group 48 years and more. Moreover, 62.9 percent of the study sample were males, and 85.7 percent were married. The highest percent 28.6 were secondary school graduate. In addition, 34.3 percent of the study sample were housewives as the highest percent of the study sample.

Table (4.2.) presented that more than half of the study sample (54.3) percent were overweight, 60 percent of them have hypertension, 57.1 percent have diabetes mellitus, and 62.9 percent have hyperlipidemia. In relation to smoking, 85.7 percent of the study sample do not smoke, and 37.1 percent have other person smoke at home.

Table (4.3.) presented that there were significant differences were happened at the knowledge of patients related to a healthy lifestyle about percutaneous coronary intervention.

Table (4.4) presented that there were significant differences in all items about physical activity for patients with percutaneous coronary intervention

Results:

Table (1): Distribution of Socio-Demographic Characteristics of study sample

Variable	Groups	Study Sample (35)	
		Freq.	%
Age groups	18-27	0	0
	28-37	1	2.9
	38-47	7	20
	48 and more	27	77.1
	Total	35	100
	$\bar{x} \mp SD$	55.6 +_ 9.95	
Gender	Male	22	62.9
	Female	13	37.1
	Total	35	100
Marital status	Married	30	85.7
	Single	0	0
	Divorced	1	2.9
	Widowed	4	11.4
	Total	35	100
Level of education	Do not read and write	3	8.6
	Read and write	5	14.3
	Primary	9	25.7
	Secondary	10	28.6
	Academic	8	22.9
	Total	35	100
Job	Governmental employee	7	20
	Retired	7	20
	Retired and work	0	0
	Free work	9	25.7
	Housewife	12	34.3
	Total	35	100

-frec=frequency, % = percentage, $\bar{x} \mp SD$ = arithmetic Mean ($\bar{x}$) and Standard Deviation (S.D.)

Table (2): Distribution of Clinical Characteristics of Study Sample

Clinical Characteristics	Groups	Study Sample (35)	
		Freq.	%
Body Mass Index	BMI less than 18.5 (Underweight)	0	0
	BMI 18.5 – 24.9 (Normal)	1	2.9
	BMI 25 – 29.9 (overweight)	19	54.3
	BMI 30 or higher (obese)	15	42.9
	Total	35	100
(hypertension)	Yes	21	60
	No	14	40
	Total	35	100
(Diabetes mellitus)	Yes	20	57.1
	No	15	42.9
	Total	35	100
Hyperlipidemia	Yes	22	62.9
	No	13	37.1
	Total	35	100
Smoking	Yes	5	14.3
	No	30	85.7
	Total	35	100
No. of smoking per day	20	2	5.6
	30	1	2.9
	40	1	2.9
	60	1	2.9
	No	30	85.7
	Total	35	100
Other person smoking at home	Yes	13	37.1
	No	22	62.9
	Total	35	100

Freq.= frequency, % = percentage

Table (3): Comparison between Patients' Knowledge (pre-post) test toward healthy lifestyle after percutaneous coronary intervention

Items	Pre-test			Post-test		
	F	T	As	F	T	As

	No	Not sure	Yes			No	Not sure	Yes		
Heart disease only happens in older people who smoke or have high cholesterol?	15	1	19	2.11	M	35	0	0	3	H
Percutaneous coronary intervention, also known as coronary angioplasty, is a non-surgical technique for treating obstructive coronary artery disease, including angina, myocardial infarction and multi vascular coronary diseases	0	1	34	2.97	H	0	0	35	3	H
Medication such as aspirin help prevent blood clot from forming	0	1	34	2.97	H	0	0	35	3	H
Stop taking anticoagulant medications when you feel better	22	5	8	1.6	L	32	3	0	2.91	H
Increase more than the prescribed dose when your health condition worsens	25	5	5	1.42	L	34	1	0	2.97	H
Lifestyle changes like healthy eating can lower your chances of developing heart disease?	0	0	35	3	H	0	0	35	3	H
To help control your blood pressure, eat less salt and exercise regularly	0	0	35	3	H	0	0	35	3	H
Stick to a vegetarian diet and avoid eating eggs to control cholesterol	2	11	22	2.57	H	0	1	34	2.97	H
Resistance training (lifting weights or using elastic bands) can strengthen your muscles and help lower your blood sugar	3	18	14	2.31	M	1	8	26	2.71	H
Warm - up before exercising raises your heart rate and lowers your chance of getting angina	1	11	23	2.6	H	0	4	31	2.88	H
Increase the speed while walking when feeling chest pain to see if it will disappear or not	28	3	4	1.31	L	35	0	0	3	H
Doing exercise to increase physical activity at least half an hour a day every day for five days or most days of the week	2	1	32	2.85	H	0	0	35	3	H
Eating more meat and milk products is a good way to add more fiber to your diet	20	8	7	1.62	L	0	0	35	3	H
Prepared or processed foods such as canned soup, usually have a lot of salt (sodium)	3	11	21	2.51	H	0	1	34	2.97	H
Trans fat is an unhealthy type of fat that is often found in baked or fried foods	2	4	29	2.77	H	0	0	35	3	H
coronary artery disease may occur again	0	3	32	2.9	H	0	0	35	3	H
Total score	0	11	24	2.68	H	0	11	24	2.68	H

Ass. = Asymptomatic significant; H = High (2.34 – 3), M = Moderate (1.67 – 2.33), L = Low (1 – 1.66).

Table (4): Comparison between healthy lifestyle of patients with percutaneous coronary intervention (physical activity)

tems	Pre-test					Post-test				
	F/ times a week			Total MS	Ass.	F/ times a week			Total MS	Ass
	Light (less than 3)	Neutral (3 - 5)	Strong (5 - 7)			Light (less than 3)	Neutral (3 - 5)	Strong (5 - 7)		
1. Do exercise such as walking or jogging slowly for at least 20-30 minutes	1	6	28	2.77	S	0	0	35	3	S

2. riding a bicycle for 20 minutes	12	8	15	2.08	N	2	8	25	2.65	S
3. walking at work or holiday days for 30 minutes	2	5	28	2.74	S	0	0	35	3	S
4. doing housework such as arrangement, cleaning , children rearing and kitchen works	1	5	29	2.8	S	0	0	35	3	S
5. working in the garden of the house for 20 minutes	10	14	11	2.02	N	0	0	35	2.77	S
Total score	2	6	27	2.71	S	1	6	28	3	S

Ass. = Asymptomatic significant; S = Strong (2.34 – 3), N = Neutral (1.67 – 2.33), L = Light (1 – 1.66).

DISCUSSION

The result in the table (4-1) concerning socio-demographic characteristics presented that more than half of the study sample were within the age group 48 years and more, male, married, had a primary school education, and housewife. This finding was supported by (Mousa, 2020) who illustrated in his study in Iraq at Baghdad city to Evaluate the "Effectiveness of an Instructional Program on Patients' Knowledge and Attitudes concerning Healthy Lifestyle after Percutaneous Coronary Intervention at Cardiac Centers in Baghdad City" that majority of samples in study and control groups were male, with the mean age (56-63) married, primary school graduate

Table (4-2) presented that more than half of the study sample were overweight, suffer from hypertension, have diabetes mellitus,have hyperlipidemia, and most of the study participants

do not smoke but had other person smoke at home. Hamid (2016) find that HT&DM have the highest incidence in our patients but smoking is less prevalent in our study. This is consistent with the current study.

Table (4.3) there was a big difference in the knowledge of patients about some areas such as (Heart disease only happens in older people who smoke or have high cholesterol, Stop taking anticoagulant medications when you feel better, Increase more than the prescribed dose when your health condition worsens, Resistance training (lifting weights or using elastic bands) can strengthen your muscles and help lower your blood sugar, Increase the speed while walking when feeling chest pain to see if it will disappear or not, Eating more meat and milk products is a good way to add more fiber to your diet). This result comes into agreement with the finding of (Kittan & Hamza, 2020),who stated that after using an Instructional Programs on Patient's Knowledge Regarding Self-Care Management after Ischemic Heart Disease, there was a highly significant link between (Pre & Post-test case groups) at (p-value = 0.000).

Tables (4-4), presented that there were significant differences in post-test knowledge of all items about physical activity for patients with percutaneous coronary intervention after completing the instructional program. The results demonstrated that in some areas of exercise an acceptable level respectively pre-implementation program. This encompasses the following questions which are (riding a bicycle for 20 minutes, working in the garden of the house for 20 minutes). While the percentage of these answers increased after the application of the program and became a high level. This means that the patients benefited from the educational lectures given to them. The researcher agrees with the recommendations in the guidelines. Exercise is a very important measure that everyone should do on a regular basis, especially people with IHD because evidence and guidance show that it has a significant physiological benefit.

This finding is backed up by (Al - Tamimi et al, 2017), who conducted a descriptive pilot study in Oman to assess the amount of knowledge about lifestyle habits in thirty patients with CAD. According to the findings, only about a third of the overall sample exercises less than twice per week, and only about half of the sample exercises more than five times per week.

CONCLUSIONS

The majority of CAD patients are males with age 48 and above, male, married, secondary school graduates, and housewives, more than half of the study sample had risk factors for coronary artery disease, except for the patient's own smoking, Patients with coronary artery disease had a low degree of knowledge about healthy lifestyles before beginning the instructional program.A significant improvement in patient's knowledge regarding healthy lifestyles after giving them the instructional program

ETHICAL CONSIDERATIONS COMPLIANCE WITH ETHICAL GUIDELINES

This study was completed following obtaining consent from the University of Baghdad.

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AUTHOR'S CONTRIBUTIONS

Study concept, Writing, Reviewing the final edition by all authors.

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