Effectiveness of an educational program on patient's dietary knowledge after recovery from myocardial infarction

Sabri Shather Hadi[1*] and Khalida Mohammed Khudur[2]

[1] Assistant Lecturer, Department of Adult Nursing, College of Nursing, Al-Qadisiyah University, Al-Diwaniyah, Iraq

[2] Professor, Department of Adult Nursing, College of Nursing, University of Baghdad, Baghdad, Iraq

Correspondence Author: Sabri Shather Hadi

Received 4 Apr 2024; Accepted 1 May 2024; Published 6 May 2024

Abstract

Background: Acute myocardial infarction is one of the most common health problems in the world and the leading cause of death, it represents a clinical condition characterized by rapidly developing critical myocardial ischemia. This indicates the requirement that MI patients need to adherence of a healthy diet and receive required education on changing dietary pattern, dietary regimens, including the composition, calorie intake, and feeding patterns, represent major factors affecting of myocardial infarction patients.

Aim of this study: The study aims to evaluate the patient's dietary knowledge after recovery from myocardial infarction, and to find out the association between the effectiveness of educational program and patient's socio-demographic characteristics (age, gender, level of education, occupational status and residential area).

Methodology: The quasi-experimental design has been carried out to evaluate the patient's dietary knowledge after recovery from myocardial infarction, in the cardiac outpatient clinic at Al-Diwaniyah teaching hospital for the period from 17th January 2023 to 3th May, 2024. Non probability (purposive) sample of (60) patients were selected who are recovery from myocardial infraction for at least four weeks and they had attended of cardiac outpatient clinics of AL Diwaniyah teaching hospital, the sample was divided into two groups each one consisted of (30) patients as study and control group. The study instrument comprised of (3) parts: Part I- demographical characteristics of the patient which consist of (7) items. Part II- Clinical characteristics data which consists of (3) items and Part III- Patient's Dietary Knowledge which consists of (20) close-ended statements.

Results: Results of the study shows the patient's dietary knowledge at post-test were improved to good dietary patients' knowledge in mean (2.35) regarding study group. While the dietary patients' knowledge at the Pre-Test and Post-Test Measurements for the control group were poor in pre-test (1.62), and post-test (1.61).

Conclusions: The researcher concludes that the educational program was effective in improving the patient's dietary knowledge about DASH diet, and there were statistical significant differences between the study and control group at post-test measurements regarding dietary patients' knowledge at *p* value <0.05.

Keywords: educational program, patient's dietary knowledge, myocardial infarction, DASH diet

Introduction

Cardiovascular diseases (CVDs) are among the highest three causes of mortality and morbidity in the worldwide. Along with increase in life expectancy, an increase in prevalence of chronic diseases has taken place and death rate due to heart diseases crossed 25% line in the late 20th century and this figure is expected to be at 35-60% range by 2025. In addition, along with changes in lifestyle, non-communicable diseases have become the main cause of mortality (Jeihooni, *et al*., 2018) [1]. The most common type of CVDs is Myocardial Infarction (MI), which is the outcome of coronary vessels occlusion and ischemia of myocardium, MI is a major cause of mortality among heart patients (Behnam, *et al*., 2014) [2]. In Iraq, Yemen, Egypt, Lebanon, and Jordan, there is a relatively high mortality rate from CVDs especially acute MI, the Age standardized of cardiovascular death rates are more than twofold in comparison with the United States. According to mortality estimate, approximately 25%-40% of deaths in these countries are due to cardiovascular diseases (Finegold, *et al*., 2013) [3]. There are several causes and risk factors attributed to the manifestation and progression of CVDs, these relate to both modifiable and non-modifiable risk factors. Non-modifiable risk factors relate to inherited syndromes, and genetic components, it cannot be controlled (Dichgans, *et al*., 2019) [4]. Modifiable risk factors tend relate to lifestyle and behaviors including unhealthy diet, physical inactivity, smoking, and alcohol consumption. The evidence shows that approximately 80% of CVDs can be attributed to these modifiable behavioral risk factors. Consequently, in order to address the growing burden of CVDs, the most logical intervention is the development of prevention strategies to control CVDs modifiable risk factors (Roth, *et al*., 2017) [5]. Diet play a vital role in the development and prevention of cardiovascular diseases, which is the leading contributor to mortality worldwide, while traditional epidemiological research has largely focused on single nutrients or foods, the more new studies of dietary program have allowed for reflection on both the complexity and the synergies of food and nutrient intake (Townsend, *et al*., 2015) [6]. Dietary Approaches to Stop Hypertension (DASH) diet originated in the 1990. In 1992 developed by the National Institute of Health for the United Kingdom started funding several research projects to see if specific dietary interventions

were useful in preventing hypertension and CVDs (Jones, *et al*., 2018) [7]. DASH considered a dietary pattern rich in fruits, vegetables, whole grains, low-fat dairy products and focus on plant-based rather than animal protein. DASH was originally developed for blood pressure management in people with hypertension, but is nowadays more widely recommended for populations with high risk of CVDs. Although the benefits of the DASH diet with regards to blood pressure and body weight reduction are well established, there have been no long-term clinical trials that assessed the effects of the DASH diet on risk of recurrent cardiovascular events or mortality (Said, *et al*., 2021) [8]. The DASH diet is one of such healthy dietary patterns, it is rich in many protective nutrients as high calcium, magnesium, potassium, fiber and low saturated fat with lower intake of refined carbohydrates. Moreover, it is reported that it can improve and manage different risk factors for CVD such as hypertension, dyslipidemia, and glucose intolerance (Machado, *et al*., 2016) [9].

Objectives of the study

The study aims to-

- Evaluate the patient's dietary knowledge after recovery from myocardial infarction.
- Find out the association between the effectiveness of educational program and patient's socio-demographic characteristics (age, gender, level of education, occupational status and residential area).

Methods and material

Study design

The quasi-experimental design has been carried out to evaluate the patient's dietary knowledge after recovery from myocardial infarction, with application of pre and post-test approach for the study and control group in assessing their patient's dietary knowledge regarding myocardial infarction (MI) and DASH diet. which has been achieved for the period from 17th January 2023, to 3th May, 2024.

Study setting

The study has been carried out in Al-Diwaniyah Health Directorate at Al-Diwaniyah teaching hospital in the cardiac outpatient clinics.

Study sample

A non-probability (purposive) sample of (60) patients were selected. The patients who are recovery from myocardial infraction for at least four weeks, and they had a medical records and they attended cardiac outpatient clinics at Al-Diwaniyah teaching hospital. The sample was divided into two groups each one consisted of (30) patients as study and control group.

Instrument construction

For the purpose of the present study, a questionnaire was designed and developed by the researcher, the questionnaire was constructed reviewing previous literature and related studies for myocardial Infarction and the DASH diet. The study instrument comprised of (3) parts:-

Part I: (Socio-demographic characteristics data): It consists of (7) items, related to the Socio-demographic characteristics of these patients which include: age, gender, residential area, marital status, socio- economic status, educational level, and occupational status.

Part II: (Clinical characteristics data): this part is concerned with data obtained from myocardial Infarction patients by observation and interview. The data consists of (3) items: Medical history, Medical family history about myocardial Infarction, and The recovery period from myocardial infarction.

Part III: (Patient's Dietary Knowledge): This part enquires about the patients' knowledge regarding myocardial infarction (MI) and DASH diet through 20 close-ended statements related to AMI, Healthy diet, Obesity and reduction of sodium, for each participant in the study and control group (pre and post the program). The instrument which used to patient's dietary knowledge developed from (DASH Guideline National Heart, Lung, and Blood Institute, 2017) and (Rastogi, *et al*, 2004).

Data collection

The data collection was carried out through the interview and intervention technique for each participant in the study and control group (pre and post the program), the participants in the study group were exposed to educational program, while the control group was not exposed to such an educational program. The Participants rate their level and degree of knowledge according to a three- Likert scale consisting of the following responses (I know, Uncertain and I do not know). To determine the overall evaluation of dietary patients' knowledge by calculated cut off points (give 3 point for I know, 2 point for uncertain, and 1 point for I don't know) for each participant regarding educational program, which assessed by cutoff point (0.66) due to scores (1, 2 and 3) respectively. Scores of responses are categorized according to the following level of dietary patients' knowledge: (1-1.66) = poor level of knowledge, (1.67-2.33) = fair level of knowledge and (2.34 and more) = good level of knowledge., the data were collected for the study sample in the period from 2nd July 2023, to 9 of November 2023**.**

Statistical data analysis

The following statistical data analysis approaches is used in order to analyze the data of the study under application of the statistical package of social science (SPSS) version (26), and the Microsoft excel (2016):

- **Descriptive data analysis:** Tables (Frequencies and Percentages).
- **Inferential data analysis:** This approach used to accept or reject the statistical hypothesis, which includes: Chi-Square test for testing the independency distribution of the observed frequencies, and for measuring the association between the studies variables according to its type; In addition, the comparison significant for this study the significant p-value ≤ 0.05.

Results of the study

Table 1: Distribution for both groups according to socio-demographic characteristics (N=60)

Socio-demographic Characteristics		Study G (n=30)		Control G (n=30)	
		F	%	F	%
Age (years)	35 – 44	5	16.7	5	16.7
	45 – 54	11	36.7	12	40
	55 – 64	6	20	6	20
	65 +	8	26.7	7	23.3
	Mean ±SD	55.1 ± 9.43		54.73 ± 8.94	
Gender	Male	19	63.3	19	63.3
	Female	11	36.7	11	36.7
Residential Area	Rural	8	26.7	10	33.3
	Urban	22	73.3	20	66.7
Marital Status	Single	0	0	3	10
	Married	24	80	22	73.3
	Divorced	0	0	1	3.3
	Widow	6	20	4	13.3
Socio-economic Status	Satisfied	8	26.7	4	13.3
	Satisfied to Some Extent	11	36.7	12	40
	Unsatisfied	11	36.7	14	46.7
Education Level	Read and Write	6	20	10	33.3
	Primary School	11	36.7	10	33.3
	Intermediate School	5	16.7	2	6.7
	Secondary School	2	6.7	1	3.3
	Diploma	3	10	5	16.7
	Graduate	3	10	2	6.7
Occupational Status	Government Employed	9	30	8	26.7
	Self Employed	3	10	6	20
	Unemployed	0	0	2	6.7
	Retired	12	40	3	10
	House wife	6	20	11	36.7

*F=frequency, %= percentage

Table 2: Distribution for both groups according to clinical data (N=60)

Clinical Data				Study G (n=30)		Control G (n=30)	
				F	%	F	%
Medical History	Hypertension	Yes		30	100	30	100
		No		0	0	0	0
	Diabetes	Yes	Type 1	2	6.7	2	6.7
			Type 2	13	43.3	13	43.3
			Total	15	50	15	50
		No		15	50	15	50
Medical Family History	Yes	First Degree		15	50.0	14	46.7
		Second Degree		8	26.7	7	23.3
		Total		23	76.7	21	70
	No			7	23.3	9	30
Recovery Period from Myocardial Infarction	4-5w			0	0	2	6.7
	6-7w			8	26.7	11	36.7
	8-9w			15	50.0	11	36.7
	10-13w			7	23.3	6	20

*F=frequency, %= percentage

Table (2) illustrates the clinical data of study sample. The study results about medical history (hypertension and diabetes), indicate that all the participant in the study (100%) had hypertension; with diabetes in 50% in all of them (study and control groups). Relevant medical family history, the first degree of family had equal to have percent in study and control group (50%; 46.7%) respectively. Regarding recovery period from myocardial infarction the result of this table in study group, 50% had (8-9w interval); in the control group (36.7%) had two period of recovery (6-7 w; 8-9 w) interval respectively.

Table 3: Overall evaluation of patient's dietary knowledge at the pre-test and post-test measurements (study group n=30)

Periods	Levels	Frequency	Percent	Overall mean	Overall evaluation
Pre-test	Poor	18	60.0	1.62	Poor
	Fair	12	40.0		
	Good	0	0		
Post-test	Poor	1	3.3	2.35	Good
	Fair	9	30		
	Good	20	66.7		

Cutt off point (0.66); Poor (1-1.1.66); Fair (1.67-2.33); Good (2.34 and more)

Table (3) shows that the overall evaluation of patient's dietary knowledge at the Pre-Test and Post-Test Measurements for the study group were poor in pre-test (1.62), while after application of educational program, the dietary patients' knowledge at post-test were improved to good dietary patients' knowledge in mean (2.35).

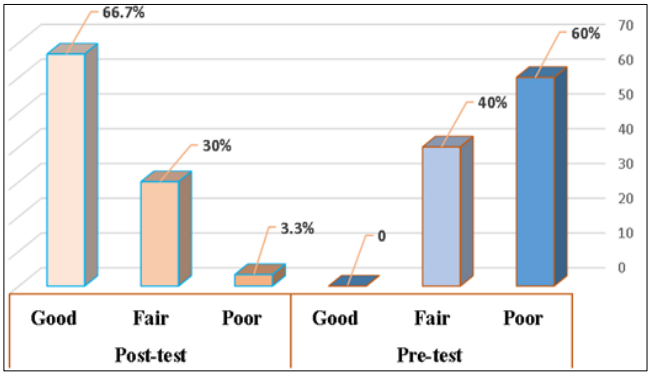

Fig 1: Overall evaluation about dietary patients' knowledge at the pre-test and post-test measurements.

Table 4: Overall evaluation of dietary patients' knowledge at the pre-test and post-test measurements (control group n=30)

Periods	Levels	Frequency	Percent	Overall mean	Overall evaluation
Pre-test	Poor	21	70	1.62	Poor
	Fair	9	30		
	Good	0	0		
Post-test	Poor	20	66.7	1.61	Poor
	Fair	10	33.3		
	Good	0	0		

Cutt off point (0.66); Poor (1-1.66); Fair (1.67-2.33); Good (2.34 and more)

Table (4) shows that the overall evaluation of dietary patients' knowledge at the Pre-Test and Post-Test Measurements for the control group were poor in pre-test (1.62), and post-test (1.61).

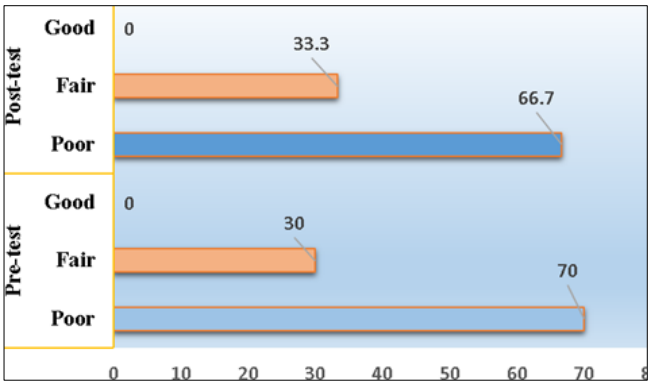

Fig 2: Overall Evaluation of Dietary Patients' knowledge at the Pre-Test and Post-Test Measurements (Control Group n=30)

Table 5: Mean difference (independent sample t-test) between the study and control group at pre-test and post-test measurements according to dietary patients' knowledge (n=60)

Periods of measurements	Groups	N	Mean	Std. Deviation	t-value	d.f	*p*-value
Pre-test	Study	30	1.620	0.221	0.031	58	0.975
	Control	30	1.621	0.191			
Post-test	Study	30	2.351	0.291	12.18	58	0.001
	Control	30	1.610	0.162			

*Sig. $p \leq 0.05$

Table 5 shows that there were statistical significant differences Between the Study and Control Group at Post-Test Measurements regarding dietary patients' knowledge at P. value <0.05.

Discussion

Part I: Discussion of patients' socio-demographic characteristics of the study sample (table 1)

According to (table 1) in the results, revealed that the majority of sample were at same age group (45-54) years old (36.7%) in study group and (40%) in control group. These results agree with the result of a previous studies of (Khaleel and Hakima, 2011) [14] and (Abdul-Ameer and Khuder, 2022) [15] who find 36.7% was within the age group (40-49) and (50-59) years respectively, in study and control group. These results are also match with the result of a previous study of (Al-Ganmi, *et al.*, 2020) [13] who find the most frequent age group is (45 years old and more). Concerning gender, (63.3%) in study sample were male, (36.7) female in both groups, this result agree with the result of (Mohammed and Narmen, 2014) [19] who find the majority of the study samples were male, also (Hussein and Widad, 2022**)** [10] who indicate that the male is the dominant gender for both the study and control groups (63.3% and 70%) respectively.

About marital status the result of table indicate the two groups were married in percent (80%; 73.3%) study and control group respectively, this result similar to a previous study of (Khasal and Atiyah, 2019) [16] who find the majority of the study subjects are married. These results are also consistent with the result of a previous study of (Mansour, 2014) [11] who find the most frequent of the study subjects are married. Regarding residential area, (73.3%) of the study group and (66.7%) of the control group live in an urban resident. This result agree with the results of a previous study of (Aldaggistany, *et al.*, 2023) [12] and (Kittan and Rajha, 2020) [20], these results indicate that the majority of subjects are urban residents rather than the countryside.

In socio-economic status, in study group (satisfied to some extent; unsatisfied) had equal result (37.7%), were the control group equal to half (46,7) of them had unsatisfied response. These results are consistent with the result of a previous study of (Herliani *et al.*, 2019) [21] and (Kittan and Rajha, 2020) [20] who find the most frequent of the study groups have insufficient monthly income.

Concerning educational level, the results indicate that (36.7%) of the study group are primary school, while for the control group the results indicate that (33.3%) of them are read and write. These results are match with the result of a previous study of (Khasal and Atiyah, 2019) [16] and (Ose *et al.*, 2012) [22] who find the majority of the study subjects can read & write and primary school graduates. Relative to the occupational status, the results show that (40%) of the study group are retired, while (36.7%) of the control group are housewives respectively. These results are consistent with the result of a previous study of (Zaitsu, *et al.*, 2019) [23] and (Kittan and Rajha, 2020) [20] who find the most frequent of the study groups are retired.

Part II: Discussion of the clinical characteristics data related to myocardial infarction patients for the study sample

According to (table 2), the study results about medical history (hypertension and diabetes), indicate that all the participant in the study (100%) had hypertension; with diabetes in 50% in all of them (study and control groups). These results are consistent with the result of a previous study of (Abdul-hussain and Huda, 2020) [17] who find the majority of the study samples are increase of blood pressure (the risky stage of hypertension). These results are also agreement with the result of a previous study of (Kiani, *et al*., 2016) [24] who indicated that the majority of study participants' were suffers from diabetes.

Relevant medical family history, the first degree of family had equal to have percent in study and control group (50%; 46.7%) respectively. These results are match with the result of a previous study of (Kadhim, *et al.*, 2022) [25] and (Sharif and Samir, 2021) [26] who shown that over than half of the people in the study group and the control group have first-degree relatives who suffer from MI.

Regarding recovery period from myocardial infarction the result of this table in study group, 50% had (8-9 w interval); in the control group (36.7%) had two period of recovery (6-7 w; 8-9 w) interval respectively. These results are consistent with the result of a previous study of (Atrous, *et al.*, 2020) [27] who indicated that the recovery period (2-3 months) are the best among MI patients who received the dietary program than patients who received dietary care in the hospital.

Part III: Discussion of dietary patients' knowledge

According to table (3) shows that the overall evaluation of

dietary patients' knowledge at the Pre-Test and Post-Test Measurements for the study group were poor in pre-test (1.62), while after application of educational program, the dietary patients' knowledge at post-test were improved to good dietary patients' knowledge in mean (2.35).

Table (4) shows that the overall evaluation of dietary patients' knowledge at the Pre-Test and Post-Test Measurements for the control group were poor in pre-test (1.62), and post-test (1.61). These results are consistent with the result of a previous studies of (Atrous, *et al*., 2020) [27] and (Abdul-hussain and Huda, 2020) [17], who conducted that there were improve in patient's dietary knowledge and their adherence toward DASH regimen at post-test of program. Also these results are supported by the results of (Paswan, 2018) [18], and **(**Khasal and Atiyah, 2019) [16], who conducted that no significant differences are accounted in controlled group at *p* value <0.05.

Table (5) shows that there were statistical significant differences Between the Study and Control Group at Post-Test Measurements regarding dietary patients' knowledge at P. value <0.05. These results are consistent with the result of a previous studies of (Abdul-Ameer and Khuder, 2022) [15] and (Khaleel and Hakima, 2011) [14], who conducted that there were significant differences in post-test knowledge measurements of all items about healthy diet for patients with AMI after completing the educational program.

The researcher's opinion that application of educational program on the study group through the program's lectures, booklet and continuous follow-up of patients in study group has contributed effectively about improving their patients' information regarding myocardial infarction (MI) and Healthy diet system (DASH diet).

Conclusions

According to the present study results, the researcher can mention the following conclusions:

- The educational program was effective in improving the patient's dietary knowledge about DASH diet.
- There were statistical significant differences between the study and control group at post-test measurements regarding dietary patients' knowledge at P. value <0.05.

Recommendations

Based on the study results discussion and conclusions, the study has Recommended the following:

- Including the DASH diet program in the curriculum of nursing colleges, through which the nursing student becomes wholly aware of the details related to this system.
- Increase the patients' knowledge and awareness regarding DASH diet by mass media and printing educational brochures to explain the importance DASH regimen and adherence to it.

References

1. Jeihooni AK, Fereidouni Z, Harsini PA, Kavi E, *et al*. "Effect of Educational Program on Lifestyle of Myocardial Infarction Patients in Iranian Population." Journal of Clinical & Diagnostic Research, 2018, 12(9). Doi.org/10.7860/JCDR/2018/36113.11990.
2. Behnam Moghadam M, Behnam Moghadam A, Yarian S, *et al*. "Predicting the Quality of Life Based on Public Health, Social Support and Self Efficacy in Cardiovascular Patients." Armaghane danesh. 2014;19(7):633-642.
3. Finegold Judith A, Perviz Asaria, Darrel P Francis. "Mortality from ischemic heart disease by country, region, and age: statistics from World Health Organization and United Nations." International Journal of Cardiology. 2013;168(2):934-945. Doi.org/10.1016/j.ijcard.2012.10.046.
4. Dichgans Martin, Sara L Pulit, Jonathan Rosand. "Stroke genetics: discovery, biology, and clinical applications." The Lancet Neurology. 2019;18(6):587-599. Doi.org/10.1016/S1474-4422(19)30043-2
5. Roth GA, Johnson C, Abajobir A, *et al*. "Global, regional, and national burden of cardiovascular diseases for 10 causes, 1990 to 2015". Journal of the American College of Cardiology. 2017;70(1):1-25. Doi.org/10.1016/j.jacc.2017.04.052
6. Townsend N, Nichols M, Scarborough P, *et al*. Cardiovascular disease in Europe-epidemiological update 2015. Eur Heart J. 2015;36(40):2696-2705. Doi.org/10.1093/eurheartj/ehv428.
7. Jones NR, Forouhi NG, Khaw KT, *et al*. "Accordance to the dietary approaches to stop hypertension diet pattern and cardiovascular disease in a British, population-based cohort." European Journal of Epidemiology. 2018;33(2):235-244. Doi.org/10.1007/s10654-017-0354-8.
8. Said MS, El Sayed IT, Ibrahim EE, Khafagy GM. Effect of DASH diet versus healthy dietary advice on the estimated atherosclerotic cardiovascular disease risk. Journal of Primary Care & Community Health, 2021, 12. Doi.org/10.1177/2150132720980952.
9. Machado JC, Cotta RM, Moreira TR, Silva LS. Adherence to non-pharmacological treatment: analysis of the impact of three health educational and nutritional strategies in hypertensive patients. Rev Nutr. 2016;29:11-22. doi.org/10.1590/1678-98652016000100002.
10. Hussein Zainab Kadhim, Widad K Mohammed. "Association between Enhancing Learning Needs and Demographic Characteristic of Patients with Myocardial Infarction." Iraqi National Journal of Nursing Specialties, 2022, 35(2). doi.org/10.58897/injns.v35i2.528.
11. Mansour Khalida A. "Assessment of the Risk Factors of Coronary Artery Diseases in Al-Nasiriyah City." Iraqi National Journal of Nursing Specialties. 2014;27(1):38-46. Doi.org/10.58897/injns.v27i1.192.
12. Aldaggistany, Zina S Abdulrahman, Ihab S Ahmed, Zuhair Al-Johar. "Prevalence and Demographic characteristics of Metabolic Syndrome in Iraqi Patients with Acute Coronary Syndrome". Journal of the Faculty of Medicine Baghdad. 2023;65(1):8-14. Doi.org/10.32007/jfacmedbagdad.6511951.
13. Al-Ganmi, Ali Hussein Alek, *et al*. "Medication adherence and predictive factors in patients with cardiovascular disease: A cross-sectional study." Nursing & Health Sciences. 2020;22(2):454-463. Doi.org/10.1111/nhs.12681.

14. Khaleel Maher, Hakima S Hassan. "Effectiveness of a dietary education program upon hypertensive clients' information." Iraqi National Journal of Nursing Specialties. 2011;24(2):33-43. Doi.org/10.58897/injns.v24i2.103.
15. Abdul-Ameer HF, Khuder KM. Effectiveness of a Diet Exercise Educational Program on Patient's Knowledge to Prevent Coronary Artery Disease Progression After Percutaneous Coronary Intervention. Pakistan Journal of Medical & Health Sciences. 2022;16(05):753-753. Doi.org/10.53350/pjmhs22165753.
16. Khasal QA, Atiyah HH. Effectiveness of an Education Program on Life-Style of Patients with Myocardial Infarction in Al Nasiriyah Hospitals. Indian Journal of Forensic Medicine & Toxicology. 2019;13(1):307-313. h/doi.org/10.5958/0973-9130.2019.00061.6.
17. Abdul-hussain Mustafa, Huda B Hassan. "Effectiveness of an Instructional Program Concerning Non-Pharmacological Guideline on Controlling Essential Hypertension among Patients at AL-Sader Hospital in AL-Najaf AL-Ashraf City". Iraqi National Journal of Nursing Specialties. 2020;33(1):93-103. Doi.org/10.58897/injns.v33i1.407.
18. Paswan Vaishali. "To assess the effectiveness of Self Instructional Module (SIM) on knowledge regarding life style modification among Myocardial Infarction patients admitted in selected hospitals in Vidarbha Region." Asian Journal of Nursing Education and Research. 2018;8(2):247-267.
19. Mohammed Abbas Jaber, Narmen Badri Tawfiq. "Construction Of Nursing Assessment Rehabilitation Tool For Cardiac Medical Ward Patients At Baghdad Hospitals". Journal of Kufa for Nursing Science, 2014, 4(1). Doi.org/10.36321/kjns.vi20141.2450.
20. Kittan, Ahmed Abdul-Hussein, Rajha Abdul Hassan Hamza. "Effectiveness of an Instructional Programs on Patient's Knowledge Regarding Self-Care Management after Ischemic Heart Disease." Indian Journal of Forensic Medicine & Toxicology. 2020;14(1):1111-1116.
21. Herliani YK, Rahayu U, Purba CIH, *et al*. "Patients' needs on nutritional counseling and risk factor management among myocardial infarction patients in cardiac rehabilitation". Journal of Nursing Care, 2019, 2(2). Doi.org/10.24198/jnc.v2i2.22082.
22. Ose D, Van Lieshout J, Campbell SM, *et al*. "Identifying factors associated with experiences of coronary heart disease patients receiving structured chronic care and counseling in European primary care". BMC Health Services Research. 2012;12(1):1-11. Doi.org/10.1186/1472-6963-12-221.
23. Zaitsu M, Kato S, Kim Y, *et al*. "Occupational Class and Risk of Cardiovascular Disease Incidence in Japan: Nationwide, Multicenter, Hospital-Based Case-Control Study". Journal of the American Heart Association, 2019, 8(6). Doi.org/10.1161/JAHA.118.011350.
24. Kiani, Fatemeh, Nasrin Hesabi, Azizollah Arbabisarjou. "Assessment of risk factors in patients with myocardial infarction". Global Journal of Health Science. 2016;8(1):255. Doi.org/10.5539/gjhs.v8n1p255
25. Kadhim, Miaad Hussein, Sabri Khalf Shikho, Yousif Mohammed Younis. "Knowledge and Life-Style Changes for Patients with Myocardial Infarction after Percutaneous Coronary Intervention". Journal of Duhok University. 2022;25(2):283-290. Doi.org/10.26682/sjuod.2022.25.2.26.
26. Sharif, Bayan Omar, Samir Y Lafi. "Common Risk Factors of Myocardial Infarction and Some Socio Demographic Characteristics in Sulaimani City." Kurdistan Journal of Applied Research, 2021, 136-143. Doi.org/10.24017/science.2021.2.13.
27. Atrous AEH, Hassan M, Shaban Mosa HE, *et al*. "Dietary Rehabilitation Effectiveness on Coronary Artery Diseases Patient's Outcomes". Systematic Reviews in Pharmacy, 2020, 11(12).