# Effectiveness of Daily Living Activities Program on Total Cholesterol, Low-Density Lipoprotein, and High-Density Lipoprotein of Patients with coronary artery disease

# فاعلية برنامج النشاطات الحياتية اليومية على مستوى الكوليسترول و البروتين الدهني منخفض الكثافة والبروتين الدهني مرتفع الكثافة لمرضى الشرايين التاجية

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**الخلاصة:**

**خلفية البحث:** تعد المستويات العالية من الكوليسترول الكلي والبروتين الدهني منخفض الكثافة وانخفاض مستويات البروتين الدهني عالي الكثافة من عوامل الخطر للمرضى الذين يعانون من مرض الشريان التاجي. كما تعتبر الأنشطة اليومية مهمة جدًا لمرضى أمراض القلب التاجية نظراً لتأثيرها على تحسين وظائف القلب وملف الدهون وتقليل عوامل خطر الإصابة بأمراض القلب التاجية وانخفاض معدل حدوث أمراض الشرايين التاجية ومعدل تكرارها.

**الاهداف:** لمعرفة فاعلية برنامج الأنشطة الحياتية اليومية على مستويات الكوليسترول الكلي والبروتين الدهني منخفض الكثافة و البروتين الدهني عالي الكثافة لمرضى الشرايين التاجية.

**المنهجية:** دراسة تجريبية تم اجراؤها خلال الفترة من 20 / كانون الأول / 2020 إلى 4 / نيسان / 2021، في مركز الناصرية للقلب بمدينة الناصرية على 40 مريضاً بأمراض الشرايين التاجية تم اختيارهم باستخدام طريقة العينة غير الاحتمالية العشوائية. تتكون أداة الدراسة من 4 محاور، المحور الأول: شمل الخصائص الديموغرافية، والمحور الثاني: يخص التاريخ السريري و السلوكيات غير الصحية للمريض، والمحور الثالث: يخص فحص مستويات الكوليسترول الكلي، والبروتين الدهني منخفض الكثافة، ومستويات البروتين الدهني عالي الكثافة، اما المحور الرابع: فيتكون من جزئيين متعلقين باستجابات المرضى فيما يتعلق بعوامل الخطر وأهمية النشاط والنظام الغذائي الصحي وإدارة التوتر.

**النتائج:** اشارت الدراسة الى أن (50.0٪) من المشاركين في عينة الدراسة ضمن الفئة العمرية (56- 66) سنة، وأن (57.5٪) من المشاركين في عينة الدراسة هم من الإناث، و (82.5٪) من عينة الدراسة متزوجون و (85.0٪) من سكان الحضر، (35.0٪) من عينة الدراسة تخرجوا من المرحلة الإعدادية، و (52.5٪) من عينة الدراسة كانوا ربات بيوت، و (52.0٪) منهم من ذوي الدخل الكافي، و (55.0٪) منهم لديهم من (7- 9) أفراد في أسرهم. وأظهرت النتائج وجود فروق ذات دلالة إحصائية بين الاختبار القبلي والبعدي لقيمة البروتين الكلي (p. value 0.044)، وقيمة البروتين الدهني عالي الكثافة (p. value (0.00، وقيمة البروتين الدهني منخفض الكثافة (p. value (0.006. كما أظهرت النتائج التغيرات في الكوليسترول الكلي والبروتين الدهني منخفض الكثافة ومستويات البروتين الدهني عالي الكثافة بين فترة ما قبل الاختبار وما بعده، حيث كان مستويات الكوليسترول الطبيعي (2.5٪) ثم تغيرت إلى (12.5٪) في الاختبار البعدي. وكان مستوى الحد العالي (97.5٪) ثم تغير إلى (87.5٪) في الاختبار البعدي، والبروتين الدهني عالي الكثافة الطبيعي كان (00.0٪) ثم تغير إلى (17.5٪) في الاختبار البعدي؛ ومستوى الحد العالي كان (12.5٪) ثم تغير إلى (37.5٪) في الاختبار البعدي؛ وكان المستوى المرتفع (87.5٪) ثم تغير إلى (45٪) في الاختبار البعدي، وكان البروتين الدهني منخفض الكثافة الطبيعي بنسبة (00.0٪) في الاختبار القبلي ثم تغير إلى (17.5٪) في الاختبار البعدي؛ ومستوى الحد العالي كان (100٪) ثم تغير إلى (82.5).

**الاستنتاج:** خلصت الدراسة إلى أن البرنامج الارشادي للنشاطات الحياتية اليومية كان فعالاً في تحسين مستويات الكوليسترول الكلي والبروتين الدهني منخفض الكثافة ومستويات البروتين الدهني عالي الكثافة لعينة الدراسة بعد تنفيذ البرنامج الارشادي.

**التوصيات:** توعية مرضى الشرايين التاجية بآثار فرط الدهون في الدم على صحة شرايينهم التاجية، وكذلك تشجيعهم على المشاركة في الأنشطة اليومية. وزيادة وعي المريض باستخدام وسائل الإعلام الجماهيرية حول أهمية التمارين الرياضية ونمط الحياة الصحي وأثره على تحسين ملف الدهون وتقليل معدل حدوث وتكرار أمراض الشرايين التاجية.

**الكلمات المفتاحية:** أمراض الشرايين التاجية، النشاطات الحياتية اليومية، الكوليسترول، البروتين الدهني علي الكثافة، البروتين الدهني منخفض الكثافة.

**ABSTRACT:**

**Background:** High levels of total cholesterol, low-density lipoprotein (LDL), and low levels of high-density lipoprotein (HDL) are risk factors for patients with coronary artery disease (CAD). Daily activities are very important for CAD patients due to their effect on improving heart functions, lipid profile, reduced risk factors, decreased incidence and the recurrence rate of CAD.

**Aims of the study:** To find out the effectiveness of daily living activities program on Total Cholesterol, LDL, and HDL of Patients with coronary artery disease.

**Methodology:** A pre-experimental study design was implemented from the 20th of December 2020 to the 4th of April 2021.The study was carried out in AL-Nasiriya Heart Center in AL-Nasiriya city on 40 coronary artery disease patients selected by using A non-probability (purposive) sampling method was used for selecting the study sample. The study instrument is composed of 4 parts. The first is demographic characteristics, the second part is the clinical history of patient and unhealthy behaviors, the third part is about investigation of total cholesterol, low-density lipoprotein, and levels of high-density lipoprotein, and the fourth part consists of two items related to patients' responses regarding risk factors, importance of activity, healthy diet, and stress management.

**Results:** The study reveals that (50.0%) of the participants in the study sample at age group (56–66) years old, and (57.5%) of the participants in the study sample are females, (82.5%) of study sample is married and (85.0%) was from urban resident, (35.0%) of the study sample was Graduated from middle school education, (52.5%) of study sample was housewives, and (52.0%) of them are In Sufficient income, also (55.0%) of them have (7-9)

persons in their family. The results indicate that there is significant statistically differences between pre and post-test for total cholesterol p value (0.044), high density lipoprotein p value (0.00), and low density lipoprotein p value (0.006). Also showed that the cholesterol normal category was (2.5%) changed to (12.5%); Borderline high category was (97.5%) decreased to (87.5%) at post-test, high density lipoprotein normal category was (00.0%) changed to (17.5%); borderline high category was (12.5%) changed to (37.5%); high category was (87.5%) changed to (45%) at post-test, low density lipoprotein normal category was (00.0%) increased to (17.5%); borderline high category was (100%) changed to (82.5).

**Conclusion:** The study concluded that the instructional program of daily living activities was effective in improving the levels of total cholesterol, low-density lipoprotein (LDL), and levels of high-density lipoprotein (HDL) of the study sample after the program implementation.

**Recommendations:** Educating coronary patients on the effects of hyperlipidemia on the health of their coronary arteries, as well as encouraging them to participate in daily activities. Increase patient awareness by using Mass Media about the importance of exercise and a healthy lifestyle and its impact on the lipid profile to reduce the incidence and the recurrence rate of CHD.

**Keywords:** Coronary Artery disease, Daily Living Activities, Total cholesterol, Low-density lipoprotein (LDL), and High-density lipoprotein (HDL).

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## INTRODUCTION

Coronary artery disease is a serious cardiovascular illness that affects people all over the world. This disease has been identified as the top cause of death in both developed and developing countries. Lifestyle, environmental, and hereditary variables all have a role in cardiovascular disease. The prevalence of risk factors among healthy people predicts a rise in CAD incidence in the near future. Coronary artery disease is caused by a combination of variables including diabetes, hypertension, smoking, hyperlipidemia, obesity, inactivity, homocystinuria, and psychological stress [(1)].

Controlling cardiovascular risk factors can slow the course of CAD and reduce the risk of future coronary events while also improving patient satisfaction. This is performed by the use of disease-modifying drugs, as well as a standardized fitness regimen and lifestyle adjustments. Overall and cardiovascular mortality, as well as hospital admissions, have been demonstrated to be reduced by exercise [(2)].

High-density lipoprotein (HDL) cholesterol levels are reduced by sedentary life style. When HDL levels are down, there is less good cholesterol available to remove bad cholesterol from your arteries. Physical activity is important for maintaining good health. At least 150 minutes of moderate-intensity aerobic exercise a week will help to reduce cholesterol and high blood pressure. There are several choices, including brisk walking, swimming, bicycling, and even yard work [(3)].

Hyperlipidemia is described as an abnormally high level of lipids and lipoproteins in the blood. Lipoproteins transport cholesterol across the body. Low-density lipoproteins are the main carriers of cholesterol. Since LDLs accumulate cholesterol on artery walls, high levels of LDL cause atherosclerosis. By transferring cholesterol to the liver for excretion, high-density lipoproteins (HDLs) help remove cholesterol from the arteries. HDL levels above 0.4 mmol/L have a protective effect, lowering the risk of coronary heart disease; HDL levels below 0.4 mmol/L, on the other hand, are linked to a higher risk of coronary heart disease. Fatty acids bonded to glycerol form triglycerides. They are borne by very low-density lipoprotein molecules and are used by the body for fat storage. Triglycerides that are too high are linked to an increased risk of heart disease [(4)].

Physical inactivity is very common around the world, despite the advantages of daily exercise for the prevention and treatment of cardiovascular disease. Regular exercise can

enhance cardiovascular health by non-traditional pathways in addition to simply modifying well-known risk factors for systemic CVD. Understanding the processes by which exercise affects various physiological systems is crucial, as it could lead to new therapeutic methods for treating CVD pathophysiological mechanisms. Regular exercise enhances cardiac parasympathetic regulation, which protects against malignant arrhythmias and also protects against ischemia–reperfusion injury. Exercise, in part by stimulating circulating antigenic cells, may enhance myocardial regeneration ability [(5)].

Physical activity during leisure time is helpful in the primary prevention of cardiovascular disease, with a dose–response relationship that results in a 20% decrease in cardiovascular events and a 5-year improvement in life expectancy. High cardiovascular fitness as a result of strenuous activity appears to be more essential than overall activity duration in this regard. Exercise training improves endothelial function and slows the progression of coronary stenosis in secondary prevention, partly through ant atherosclerotic effects on platelets and leukocytes [(6)].

## AIMS OF THE STUDY

The study aims to evaluate the effectiveness of daily living activities instructional program on Total Cholesterol, LDL, and HDL of Patients with coronary artery disease.

## METHODOLOGY:

- **Study Design**

A pre-experimental study design was implemented from the 20th of December 2020 to the 4th of April 2021.

- **Study Setting**

The study was carried out in AL-Nasiriya Heart Center in AL-Nasiriya city.

- **Study Sample**

A non-probability (purposive) sampling method was used for selecting the study sample of 40 coronary artery disease patients were attending to the AL-Nasiriya Heart Center. The sample was collected according to the following criteria:

1. Adult patients with coronary artery disease.
2. Females and males patients.
3. The patients who are eligible for participation in the program.
4. Patient who is agreeable to comeback on the post-test period.
5. Patients who conducted cardiac catheterization.

- **Study Instrument**

The study instrument is composed of 4 parts. The first is demographic characteristics, the second part is the clinical history of patient and unhealthy behaviors, the third part is about investigation of total cholesterol, low-density lipoprotein, and levels of high-density lipoprotein, and the fourth part consists of two items related to patients' responses regarding risk factors, importance of activity, healthy diet, and stress management.

- **Program Implementation**

The patients who participated in the present study were dealt with the instruction program to improve their total cholesterol, LDL, and HDL levels by exercise and knowledge regarding the risk factors, importance of daily activities, healthy diet, and stress management. The instruction program included the emphasis on the importance of daily activities for coronary artery patients and its effect on the lipid profile. The exercises are also explained that included aerobic, resistance, and stretching exercise and how to do them in practice. The researcher distributed a leaflet about the instruction program, including illustrations of the exercises in pictures. The total cholesterol, LDL, and HDL were investigated before and after 6 weeks of the instruction program in the laboratory of the AL-Nasiriya Heart Center.

## RESULTS:

**Table (1):** Distribution of the Study Sample according to their Socio-Demographic characteristics (No=40).

| Sample Socio-Demographic Characteristics | | | | | |
|---|---|---|---|---|---|
| **Gender** | | | **Residency** | | |
| | **No.** | **%** | | **No.** | **%** |
| Male | 17 | 42.5% | Urban | 34 | 85.0% |
| Female | 23 | 57.5% | Rural | 6 | 15.0% |
| **Total** | **40** | **100.0%** | **Total** | **40** | **100.0%** |
| **Age** | | | **Level of Education** | | |
| | **No.** | **%** | | **No.** | **%** |
| 45-55 years | 19 | 47.5% | Secondary | 1 | 2.5% |
| 56-66 years | 20 | 50.0% | Middle school | 14 | 35.0% |
| 67≥ | 1 | 2.5% | Institute | 12 | 30.0% |
| Mean ± SD | 3.5500 ± 0.55238 | | College & more | 13 | 32.5% |
| **Total** | **40** | **100.0%** | **Total** | **40** | **100.0%** |
| **Marital Status** | | | **Monthly Income** | | |
| | **No.** | **%** | | **No.** | **%** |
| | | | Sufficient | 3 | 7.5% |
| Married | 33 | 82.5% | Barely Sufficient | 16 | 40.0% |
| Widower | 7 | 17.5% | In Sufficient | 21 | 52.5% |
| **Total** | **40** | **100.0%** | **Total** | **40** | **100.0%** |
| **Employment** | | | **Family Members** | | |
| | **No.** | **%** | | **No.** | **%** |
| Employee | 5 | 12.5% | 1-3 | **1** | **2.5%** |
| Unemployed | 9 | 22.5% | 4-6 | **14** | **35.0%** |
| Housewife | 21 | 52.5% | 7-9 | **22** | **55.0%** |
| Retired | 2 | 5.0% | 10-12 | **3** | **7.5%** |
| Free job | 3 | 7.5% | 13 or more | **0** | **00.0%** |
| **Total** | **40** | **100%** | **Total** | **40** | **100%** |

F = Frequency; % = Percentage; ≤ = Equal or More than; S.D: Standard Deviation

Table (1) reveals that 50.0% of the participants in the study sample at age group 56-66 years old, and 57.5% of the participants in the study sample was females, 82.5% of study sample is married and 85.0% from urban resident, 35.0% of the study sample was graduated from middle school education, 52.5% of study sample was housewives, and 52.0% of them was in sufficient income.

**Table (2):** Distribution of the study sample according to Unhealthy Behaviors and Clinical History

| Variables | Categories | F. | % |
|---|---|---|---|
| **Unhealthy behaviors** | | | |
| **Drink alcohol** | Yes | **0** | **0.00** |
| | No | **40** | **100** |
| **Smoking status** | Yes | **8** | **20.0** |
| | No | **32** | **80.0** |
| **Smoke hookah** | Yes | **1** | **2.5** |
| | No | **39** | **97.5** |

| | | | |
|---|---|---|---|
| **Medical history** | | | |
| **Hypertension** | Yes | **23** | **57.5** |
| | No | **17** | **42.5** |
| **Diabetes mellitus** | Yes | **30** | **75.0** |
| | No | **10** | **25.0** |
| **Family history** | | | |
| **Heart disease** | Yes | **34** | **85.0** |
| | No | **6** | **15.0** |
| **Hypertension** | Yes | **35** | **87.5** |
| | No | **5** | **12.5** |
| **Diabetes mellitus** | Yes | **34** | **85.0** |
| | No | **6** | **15.0** |

F = Frequency; % = Percentage.

Table (2) reveals that 100.0% of the participants in the study sample were not drink alcohol, 80.0% of them were not smokers, and 97.5% was not smoke hookah. Regarding the medical history the results showed that 57.5% of them have hypertension, and 75.0% of them have diabetes mellitus. According to the family history the results reveals that 85.0% of them have a family history of heart diseases, 87.5% of them have a family history of hypertension, and 85.0% have a family history of diabetes mellitus.

**Table (3):** Distribution of the study sample according to investigations of Total Cholesterol, High Density Lipoprotein, and Low Density Lipoprotein at pre and post-test

| **Variables** | **Categories** | **Pre-test** | | **Post-test** | |
|---|---|---|---|---|---|
| | | **F** | **%** | **F** | **%** |
| **Total Cholesterol** | Normal <200 | **1** | **2.5** | **5** | **12.5** |
| | Borderline high 200-239 | **39** | **97.5** | **35** | **87.5** |
| | High 240-higher | **0** | **00.0** | **0** | **00.0** |
| **High Density Lipoprotein** | Normal 50and higher | **0** | **00.0** | **7** | **17.5** |
| | Borderline high 40-49 | **5** | **12.5** | **15** | **37.5** |
| | High <40 | **35** | **87.5** | **18** | **45.0** |
| **Low Density Lipoprotein** | Normal <130 | **0** | **00.0** | **7** | **17.5** |
| | Borderline high 130-159 | **40** | **100** | **33** | **82.5** |
| | High 160-higher | **0** | **00.0** | **0** | **00.0** |

F = Frequency; % = Percentage; > = More than ; < = Less than

Table (3) Shows the changes in body mass index between pre-test and post-test period, total cholesterol normal 2.5% change to 12.5%; Borderline high was 97.5% change to 87.5%, high density lipoprotein normal was 00.0% change to 17.5%; borderline high was 12.5% change to 37.5%; high was 87.5% change to 45%, low density lipoprotein normal was 00.0% change to 17.5%; borderline high was 100% change to 82.5.

**Table (4):** Patient's Responses regarding Risk Factors and Daily Activities at Pre and Post-test

| No | Item of risk factors and daily activities | Pre test | | | | | | Post test | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | know | | Uncertain | | Don't know | | Know | | Uncertain | | Don't know | |
| | | F | % | F | % | F | % | F | % | F | % | F | % |
| 1 | High blood pressure, high blood sugar,… are risk factors for heart disease. | 18 | 45.0 | 19 | 47.5 | 3 | 7.5 | 40 | 100.0 | 0 | 00.0 | 0 | 00.0 |
| 2 | Stop smoking, and reduce the food salt reduces the risk of heart disease. | 24 | 60.0 | 10 | 25.0 | 6 | 15.0 | 40 | 100.0 | 0 | 00.0 | 0 | 00.0 |
| 3 | Eating fruits and vegetables are factors that reduce the risk of cardiovascular disease. | 11 | 27.5 | 12 | 30.0 | 17 | 42.5 | 39 | 97.5 | 1 | 2.5 | 0 | 00.0 |
| 4 | Regular physical activity promotes health, such as brisk walking (3 to 4 miles per hour) for at least 30 minutes five or more times a week. | 0 | 0 | 0 | 0 | 40 | 100 | 34 | 85.0 | 5 | 12.5 | 1 | 2.5 |
| 5 | People who go about daily activities have an increase in HDL levels. | 0 | 0 | 1 | 2.5 | 39 | 97.5 | 22 | 55.0 | 14 | 35.0 | 4 | 10.0 |
| 6 | Physical ability is the ability to perform some daily physical activities such as shopping and social visits. | 0 | 0 | 2 | 5.0 | 38 | 95.0 | 31 | 77.5 | 5 | 12.5 | 4 | 10.0 |
| 7 | One of the characteristics of aerobic exercise is that your heart rate increases for 10 minutes or more. | 0 | 0 | 1 | 2.5 | 39 | 97.5 | 32 | 80.0 | 5 | 12.5 | 3 | 7.5 |
| 8 | Moderate intensity exercise is the level of exercise intensity at which you can talk and have a conversation with another person while you exercise. | 0 | 0 | 2 | 5.0 | 38 | 95.0 | 29 | 72.5 | 8 | 20.0 | 3 | 7.5 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **9** | **The benefit of warm-up is prepare the heart and muscles for exercise. and To reduce symptoms when you exercise.** | 1 | 2.5 | 2 | 5.0 | 37 | 92.5 | 25 | 62.5 | 15 | 37.5 | 0 | 00.0 |
| **10** | **Cardiovascular endurance is the ability of the heart to provide muscles with adequate oxygen during prolonged physical activity.** | 0 | 0 | 0 | 0 | 40 | 100 | 28 | 70.0 | 12 | 30.0 | 0 | 00.0 |
| **11** | **In strength exercises, the duration of the exercise depends on the number of exercises you perform and the number of frequency each exercise** | 0 | 0 | 1 | 2.5 | 39 | 97.5 | 29 | 72.5 | 7 | 17.5 | 4 | 10.0 |
| **12** | **In an external hip stretch exercise, the knee is brought in an opposite direction shoulder.** | 0 | 0 | 1 | 2.5 | 39 | 97.5 | 18 | 45.0 | 13 | 32.5 | 9 | 22.5 |
| **13** | **In bridge exercise: lie on back, knees bent and lift hips up.** | 0 | 0 | 0 | 0 | 40 | 100 | 19 | 47.5 | 11 | 27.5 | 10 | 25.0 |
| **14** | **In shoulder press exercise put one hand up above your shoulder with the elbow bent and press one arm overhead** | 0 | 0 | 1 | 2.5 | 39 | 97.5 | 19 | 47.5 | 13 | 32.5 | 8 | 20.0 |
| **15** | **For successful exercise, a 5-10 minute warm-up, 30 to 60 minutes of aerobic exercise and 5-10 minutes of cool down is required most days of the week.** | 0 | 0 | 6 | 15.0 | 34 | 85.0 | 27 | 67.5 | 9 | 22.5 | 4 | 10.0 |
| **16** | **Physical inactivity is one of the risk factors that can be modified.** | 1 | 2.5 | 12 | 30.0 | 27 | 67.5 | 28 | 70.0 | 10 | 25.0 | 2 | 5.0 |
| **17** | **HDL is the good cholesterol and LDL the bad cholesterol.** | 0 | 0 | 5 | 12.5 | 35 | 87.5 | 31 | 77.5 | 7 | 17.5 | 2 | 5.0 |
| **18** | **Genetics and family history are non-modifiable risk factors.** | 0 | 0 | 0 | 0 | 40 | 100 | 19 | 47.5 | 16 | 40.0 | 5 | 12.5 |
| **19** | **It is best to avoid engaging in any exercises that are** | 0 | 0 | 1 | 2.5 | 39 | 97.5 | 34 | 85.0 | 5 | 12.5 | 1 | 2.5 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **difficult or intense in nature that do not suit our physical capabilities.** | | | | | | | | | | | | |
| **20** | **Aerobic exercise includes brisk walking, swimming, cycling, or the use of equipment such as a treadmill or stationary bike.** | 0 | 0 | 0 | 0 | 40 | 100 | 35 | 87.5 | 4 | 10.0 | 1 | 2.5 |
| **Total** | | | **6.87** | | **9.5** | | **83.63** | | **72.37** | | **20.0** | | **7.63** |

F = Frequency; % = Percentage

Table 4 revealed that the patient's responses regarding risk factors and daily activities was improved after implementation of instruction program which of high percent 83.63% of them was don't know, and their responses change to 72.37 at post-test.

**Table (5):** Patient's Responses regarding Healthy Diet and Stress Management at Pre and Post-test

| **No** | **Items of patient`s responses regarding healthy diet &stress management** | **Pre-test** | | | | **Post test** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Correct** | | **In correct** | | **Correct** | | **In correct** | |
| | | **F** | **%** | **F** | **%** | **F** | **%** | **F** | **%** |
| **1** | Nutrition science explains that a healthy diet includes | 0 | 0 | 40 | 100 | 33 | 82.5 | 7 | 17.5 |
| **2** | Eating fish is important for heart health, so it is recommended to | 4 | 10.0 | 36 | 90.0 | 40 | 100.0 | 0 | 00.0 |
| **3** | A healthy weight is maintained by | 1 | 2.5 | 39 | 97.5 | 35 | 87.5 | 5 | 12.5 |
| **4** | Fasting has a great benefit on heart health and the other body organs , so it is recommended to | 6 | 15.0 | 34 | 85.0 | 38 | 95.0 | 2 | 5.0 |
| **5** | Eating foods that contain hydrogenated vegetable oils leads to | 0 | 0 | 40 | 100 | 13 | 32.5 | 27 | 67.5 |
| **6** | From healthy habits that reduce stress | 4 | 10.0 | 36 | 90.0 | 40 | 100.0 | 0 | 00.0 |
| **7** | One of the causes of stress | 9 | 22.5 | 31 | 77.5 | 36 | 90.0 | 4 | 10.0 |
| **8** | Visiting quiet places or places that make you feel comfortable psychologically and spiritually. It reduces psychological | 33 | 82.5 | 7 | 17.5 | 40 | 100.0 | 0 | 00.0 |
| **9** | To reduce stress and mental fatigue, it is recommended to listen to | 38 | 95.0 | 2 | 5.0 | 40 | 100.0 | 0 | 00.0 |
| **10** | The goal of stress management techniques is | 0 | 0 | 40 | 100 | 29 | 72.5 | 11 | 27.5 |
| **Total** | | | **23.75** | | **76.25** | | **86.0** | | **14.0** |

F = Frequency; % = Percentage

Table (5): The results show that the patient's responses was improved at post-test regarding healthy diet, and stress management, which of the correct responses was 23.75% at pre-test, and change it to 86.0% at post-test.

**Table (6):** Statistical differences between pre and post-test for Total Cholesterol, High Density Lipoprotein, and Low Density Lipoprotein

| Variables | Pre -test | | Post-test | | t.test | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|
| | Mean | S.D | Mean | S.D | | | |
| **Total Cholesterol** | 1.975 | 0.15811 | 1.875 | 0.33493 | 2.082 | 39 | 0.044 (S.) |
| **High Density Lipoprotein** | 2.875 | 0.33493 | 2.275 | 0.75064 | 5.353 | 39 | 0.000 (H.S) |
| **Low Density Lipoprotein** | 2.0000 | 0.0000 | 1.825 | 0.38481 | 2.876 | 39 | 0.006 (H.S) |

Significant at P < 0.05, HS: Highly Significant at P < 0.00, df: degree of freedom, S.D: Standard Deviation

Table (6) shows high significant statistically differences between pre and post-test for high density lipoprotein p value 0.00, and low density lipoprotein p value 0.006, and a significant statistically differences for total cholesterol p value 0.044.

## DISCUSSION:

- **Discussion of the socio-demographic characteristics of the study sample table (1).**

A total of (40) coronary artery disease patient was involved in present study in order to evaluate their total cholesterol, LDL, and HDL after their participation in the daily living activities program. Socio-demographic characteristics provide a descriptive summary of the study participants. As shown in table (1) that 50.0% of the participants in the study sample at age group 56-66 years old, and 57.5% of the participants in the study sample are females. 82.5% of study sample are married and 85.0% was from urban resident. 35.0% of the study sample has had Graduate of middle school education. 52.5% of study sample are housewives and 52.0% are not sufficient income. In study conducted to evaluate the health beliefs about the secondary prevention among patients with CHD, their study characteristics was 50.0% , 53.3% of the participants in the case and control groups at age group 46-60 years old respectively, 53.3%, 66.6% of them was males and from urban resident respectively. 36.7% and 40.0% of the case and control groups respectively have had primary school education; also 36.7% of the case and 40.0% of the control group are housewives [(7)]. A study assess the functional capacity of patients with coronary artery disease at middle age, their study characteristics was (58.0%) of study sample were males at age 50-55 years old, (58.7%) continuous married, (29.3%) were Institute certificate, (52.0%) were barely sufficient income [(8)]. A randomized controlled trial which was done to compare the efficacy of intensive functional exercise training with that of usual cardiac rehabilitation (CR) in very old adults soon after coronary bypass surgery, the study relevant that (69%) of participants was female and the mean age of the group was 78.5 ± 3.2 [(9)]. A descriptive study conducted to assess compliance with therapeutic measures among CHD patients, reported that about (25 %) of CHD patients have had sixty years old or more, and (37%), (36.5%) of them within the age group of (50-59), (40-49) years respectively [(10)].

- **Discussion the unhealthy Behaviors, medical history, and family history of the study sample table (2)**

The unhealthy behaviors of the study sample were 100.0% of them are not drink alcohol, 80.0% of the participants are not smokers, and 97.5 are not smoke hookah. Across-sectional study conducted to determine the prevalence and to estimate the severity of depression, and some of socio-demographic variables among patients with ischemic heart disease, they reported that (66.6%) of their sample as unhealthy behaviors were not smoker, and 96.8 % were not drinker alcohol [(11)]. Our study shows that the percentage of healthy behaviors is high among the patients participating in the study sample, especially in the behaviors of drinking alcohol, due to the religious nature and social norms in that city.

High percent of the study sample have had Hypertension, (75.0%) of them have had Diabetes. A case–control study conducted to evaluate the risk factors of CHD among 200 adult patients in Mysan /Iraq, reported that (57%) of patients was suffering from hypertension, and 66% was having DM [(12)]. while, in a descriptive study that conducted to analyzed the association between self-reported exercise and mortality in patients with stable CHD. They found that (38.7%) of patients was Diabetes mellitus and (71.5%) of them have had hypertension [(13)]. From the above, it is clear to what extent the patient's clinical history is related to coronary artery disease, especially in patients with high blood pressure and diabetes.

High percent of patients` family 85.0% reported of heart diseases, diabetes and 87.5% of hypertension. The positive family history of heart diseases percent in present study is higher than a study that conducted to find correlation of lipid profile and diet with premature coronary heart disease in Kirkuk city-Iraq. Where they found in their study that (47.5%) of CHD patients with positive family history [(14)], while in descriptive study that conducted to assess the risk factors of coronary artery disease patients in Al-Nasiriyah City, they reported that (15.0%) of the positive family history of heart disease, (5.0%) of hypertension, and (6.0%) of family history of diabetes [(15)]. In a study conducted to examine the effectiveness of education program about the prevention of CHD, this study revealed that (53.33%) of patients had a family's history of CHD [(16)]. It's clear from this that people with one or more close relatives who have Heart disease, or hypertension, and diabetes are at risk of these disease.

- **Discussion the effectiveness of instruction program on study sample regarding risk factors and daily activities table (4)**

The instruction program was clear improved the Patient's responses related to risk factors and daily activities which of high percent 83.63% of them were don't know, and their responses change to 72.37 at post-test. Khasal, et al., (2019) implemented the education program on patients with MI related to lifestyle modification. Their finding was 79.62 of them was improved their knowledge after program [(17)]. Kittan, et al., (2020) conducted study to evaluate the effectiveness of an instructional program on patient's knowledge regarding self-care management after ischemic heart disease. They concluded positive and meaningful results in improving patients' knowledge with self-care management after implemented the instruction program [(18)]. This indicates that instruction programs are effective and efficient in improving patients' responses and awareness.

- **Discussion the effectiveness of instruction program on study sample regarding healthy diet and stress management table (5)**

The instruction program was clear improved the Patient's responses related to healthy diet and stress management which of the correct responses was 23.75% at pre-test, and changes it to 86.0% at post-test. Daniel, (2016) conducted study to assess the effectiveness of a self-instructional module on knowledge regarding life style modification for maintaining healthy heart among cardiac patients in selected hospital at Madurai. He found that the knowledge related to dietary modification & weight loss was 51.33% in pre-test, 83.6% after implementing the program, and the percent of the knowledge related to exercise & stress management was 42.66% in pre-test, 95.2% after the program [(19)].

- **Discussion of the investigations of Total Cholesterol, High Density Lipoprotein , and Low Density Lipoprotein at pre and post-test table (3) & (6**)

The results of table (5) showed that the cholesterol normal category was 2.5% changed to 12.5%; Borderline high category was 97.5% decreased to 87.5% at post-test, high density lipoprotein normal category was 00.0% changed to 17.5%; borderline high category was 12.5% changed to 37.5%; high category was 87.5% changed to 45% at post-test, low density

lipoprotein normal category was 00.0% increased to 17.5%; borderline high category was 100% changed to 82.5. Also, the results show high significant statistically differences between pre and post-test for high density lipoprotein with p value 0.00, low density lipoprotein with p value 0.006, and a significant statistically differences between pre and post-test for cholesterol level with p value 0.044. In study conducted to evaluate the effect of high intensity interval training for 8 weeks on the lipid profile, C-reactive protein, fasting blood sugar and anthropometric parameters of young women who do not exercise. Their finding showed significantly reducing the cholesterol level 184.9±17.6 before training and 173.3±19.06 after training. LDL level was 96.5±14.96 before training and 91±12.47 after training. Also the finding showed increase in HDL level 42.8±3.7 before training and 52.6±6.27 after training [(20)].

In a study conducted to determine the effects of supervised structured aerobic exercise training program on high and low density lipoprotein in patients with T2DM that the mean and standard deviation of LDL was 118.56 ± 19.17 (pre) and 102.64 ± 13.33 (post) and 42.70 ± 8.06 (pre) and 47.47 ± 7.16 (post) for HDL [(21)]. A study conducted aimed to evaluate impact of exercise training on clock genes in patients with coronary artery disease and type 2 diabetes mellitus. Their finding reported change in value of total cholesterol (mmol/l) was $4.78 \pm 1.00$ in baseline, $3.46 \pm 0.55$ after 4 weeks, and $4.37 \pm 0.53$ after 6 months. HDL (mmol/l) was $1.46 \pm 0.66$ in baseline, $1.31 \pm 0.46$ after 4 weeks, and $1.61 \pm 0.51$ after 6 months. LDL (mmol/l) was $2.24 \pm 0.93$ in baseline, $1.77 \pm 0.38$ after 4 weeks, and $2.16 \pm 0.59$ after 6 months [(22)]. A study conducted to determine the efficacy of cardiac rehabilitation after percutaneous coronary intervention. They concluded a significant improve in total cholesterol (p value 0.00), HDL level (p value 0.01), and LDL level (p value 0.00) after the program [(23)]. It is clear from the foregoing that exercise and cardiac rehabilitation programs can help patients with coronary artery disease improve their lipid profile.

## CONCLUSION

The study concluded that the instructional program of daily living activities was effective in improving the levels of total cholesterol, low-density lipoprotein (LDL), and levels of high-density lipoprotein (HDL) of the study sample after the program implementation.

## RECOMMENDATIONS

Educating coronary patients on the effects of hyperlipidemia on the health of their coronary arteries, as well as encouraging them to participate in daily activities, and Increase patient awareness by using Mass Media about the importance of exercise and a healthy lifestyle and its impact on the lipid profile to reduce the incidence and the recurrence rate of CHD.

- **Ethical Clearance:** All experimental protocol was approved under the College of Nursing, University of Kufa, Iraq and all experiments were carried out in accordance with approved guidelines.

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