The Impact of Health Education Program on Modifiable Risk Factors Amongpatients with Heart Attack

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Abstract: *Myocardial infarction is the clinical and pathologic syndrome results from ischemia and necrosis of myocardial tissue. The site of infarction depends on the vessel blocked; the size of infarction varies, and the area of muscle involved may be small or very extensive.The rehabilitation program for patients having heart attack play an important role on their modifiable risk factors, so patient education has demonstrated it's potential to change and improve risk factors. The aim of this study: To study the impact of health education designed to heart attack's patients having risk factors. Subjects and Methods: An experimental design was conducted at coronary care unit in Benha University Hospitals and Zagazic University Hospitals. The study included 60 patients suffering from heart attacks the previously mentioned settings. Tools of the study involved Arabic questionnaire sheet to collect data related to a patients' socio-demographic data, Risk factors assessment sheet to collect physical data and investigations and follow up sheet to record modification in patient's risk factors.Results: The Impact of health education on modifiable Risk Factors among Patients with Heart Attack the study revealed a statistically significant difference between study groups as compared to the control group.Conclusion & Recommendations: Patients who participated in the educational program showed an improvement in modifiable risk factors compared to the control group who did not participate in the program. Health care personnel must provide continuous patient educational program for Patients' with Heart Attack to acquire and develop the knowledge needed to modify the modifiable risk factors through the educational programs andalternative strategies.*

Keywords: *modifiable Risk Factors, Heart Attack, Patients, health education program, nursing, mortality, sudden cardiac death (SCD)*

I. Introduction

Myocardial infarctionMeans complete death of the myocardium, it is irreversible, occur in the center of affected area. ECG show deep Q and short R wave **(Downie et al., 2014).**Myocardial infarction classified according to its layer and location ,(**Luscher , 2015**)said , he also added that classification by location including: **-**Anterior MI which involves occlusion of the left anterior descending coronary artery (LAD) ,- Inferior MI occurs with occlusion of the right coronary artery (RCA) , it referred to diaphragmatic infarction ,**-** Posterior MI results from occlusion of the RCA or the circumflex branch of the left coronary artery . Most posterior infarcts also involve the lateral or inferior wall of the left ventricle, **-**Lateral MI, a myocardial infarction confined to the lateral wall is also relatively rare, it is often in combination with the anterior wall. Classification by layer includes:●Subendocardial MI in which the area of necrosis is confined to the subendocardial layer caused by a relatively insufficient coronary blood flow that lasts long enough for necrosis to develop. ●Transmural MI involves the entire thickness of the myocardium result from a process involving either complete occlusion of an artery or a very sever reduction in the lumen of the coronary vessel.

Myocardial infarction results from complete obstruction of the coronary artery **(Allen et al., 2013).** When the blood supply to a segment of myocardium is interrupted, the muscle becomes cyanotic and active contraction stop within one minute. There is onest of irreversible celluar necrosis in the subendocardial zone within 20 to 40 minutes after coronary artery occlusion. The necrosis progress out ward through the myocardium as a"wave front "to involve much of the thickness of the myocardium by four to six hours and is essentially transmural by 24 hours .Unless blood flow can be restored within minutes, some element of irreversible damage occurs **(Dean and Gallagher, 2012).**

Following recovery from a heart attack there is damage to the heart muscle, which takes some time to repair. The repair to the heart muscle is not always complete and scarring is usually present. There is always a chance of a recurrence due to the continued presence of diseased coronary arteries that caused the heart attack**(Timbyand Smith, 2010).** There is also the risk of heart failure developing over a period of weeks as the heart reacts to the injury it has sustained. For these reasons it is necessary for patients to be monitored carefully

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and to receive the appropriate treatment to reduce the risk of further disease progression and other heart attacks **(Michael, 2014).**

Men are more susceptible to MI than premenopausal women, although incidence is rising among women who smoke and take oral contraceptives. The incidence in postmenopausal women resembles that in men. Mortality from cardiac damage or complications is about 25%. However, more than 50% of sudden deaths occur within 1 hour after onset of signs and symptoms, before the patient reaches the hospital of those who recover, up to 10% die within the first year **(Donna et al., 2011)**and **(Daren and James, 2014).**

In Egypt the mortality rate caused by myocardial infarction is still high according toWorld Health Organization (WHO) estimation that estimates there will be about 20 million Cardiovascular disease (CVD) deaths in 2015, accounting for 30 percent of all deaths worldwide **(WHO, 2005).**The projected trends in CVD mortality and the expected shifts from infectious to chronic diseases over the next few decades. By 2030, researchers project that non-communicable diseases will account for more than three-quarters of deaths worldwide; CVD alone will be responsible for more deaths in low income countries than infectious diseases (including HIV/AIDS, tuberculosis, and malaria), maternal and perinatal conditions, and nutritional disorders combined **(Beaglehole and Bonita, 2013).** Thus, CVD is today the largest single contributor to global mortality and will continue to dominate mortality trends in the future **(WHO, 2014).**

Risk factors for heart attack are divided into **two categories**, risk factors that can be **modified (modifiable) include :** high blood pressure , smoking , diabetes , excessive alcohol intake, sedentary life style,high cholesterol levels , lack of physical activity , stress, obesity ((defined as having a body mass index (BMI) of 30 or above) and those that cannot **be modified (non modifiable)include:** age, gender, race, genetics ,family history of heart attack , preexisting coronary heart diseases , including a previous heart attack **(Karpman and Harold , 2012)and(Douglas, 2014) .** The presence of risk factors appears to accelerate the atherogenesis, decreasing the oxygen supply. The presence of risk factors can also increase the myocardium's demand for oxygen. Both individual risk factors and the presence of concurrent disease states influence the incidence ofCVD. Some populations have an increased occurrence of CVD because of definable characteristic and risks **(Phipps et al., 2013).**

Epidemiologic studies point to several factors that increase the probability that heart diseases will develop, the more risk factors present the greater the risk for heart diseases **(Mckinley, 2015).** Cardiac rehabilitation program provide effective secondary prevention of cardiovascular diseases. All cardiac rehabilitation programs emphasize patient and family education for risk factors reduction and lifestyle modification **(Kopp, 2015) and (Douglas, 2014).**The nurse must plan individualized teaching program to the patient and his family including control of modifiable risk factors, through developing a plan for home exercise program, healthy ways for diet and describe appropriate use of prophylactic treatment, state the signs and symptoms of common potential complications and the appropriateaction to be taken**(Martinez and House-Farcher, 2015).**

Patient education has become one of the most important roles for nurses working in any health care setting. Nurses are in key position to carry out health education. Since nurses are the health care providers who have continuous contact with patients and families, and are usually the most accessible source of information for the patients, patient teaching is likely to become an even more important function within the scope of nursing practice **(Harley, 2014) and (Smith, 2014).**

II. Material and Methods
Study Design: An experimental design was used to meet the aim of this study.
Study Location: The study was conducted at coronary care unit in Benha University Hospitals and Zagazic University Hospitals.
Study Duration: September 2016 to September 2017.
Sample size: sixty male and female patients.
Sample size calculation: It was according to power analysis using the program epi-info to estimate the sample size.

Subjects and Methods: The sample comprised of sixty male and female patients withheart attackwho admittedinthe above mentioned setting.Purposive samplingtechnique was used to select the samples.It was according to power analysis using the program epi-info to estimate the sample size.The criteria of thestudy inclusion; who has newly diagnosedheart attackbythe Consultant, Patient age between 40to 70 years old, who are ready to participate in study and gaveinformed consent,and patients were not exposed before to any health education program regarding heart disease, patients who accepted to participate in the study. They were divided into two equal control and study group (thirty patients for each). Patients and care givers were given a short orientation by the researcher to explain the aimand nature of the study.The studied patients and their caregivers

were informed that the study is harmless; all thegathered data were treated confidentially and used forresearch purpose only.

Inclusion criteria:
1- Patients with heart attack.
2- Both male and female.
3- Patient age between 40to 70 years old.
4- Who has newly diagnosedheart attackbythe Consultant.

Exclusion criteria:
1- Patients with previous history of angina, severe vascular disease, or other life threatening disease.
2- Patients were not exposed before to any health education program regarding heart disease.
3- Pregnant women.
4- Patients with genetic disorders.
5- Patients who are physically inactive.
6- Patients with a history of drug or alcohol abuse.

Significance of the study
Cardiovascular disease (CVD)is a major cause of death and disability in developed countries. Although the mortality for this condition has gradually declined over the last decades in western countries, it still causes about one-third of all deaths in people older than 35 years.This evidence, along with the fact that mortality from CVD is expected to continue increasing in developing countries, illustrates the need for implementing effective primary prevention approaches worldwide and identifying risk groups and areas for possible improvement.The Framingham Heart Study perfectly summarizes the risk factors that contribute to the development of CVD, providing critical information regarding objectives for the primary and secondary prevention of CVD.

Aim of the study
The present study aimed toassess the impact of health education program on modifiable risk factors among patients with heart attack.

Research question:
1- Does the educational program result in significant reduction in modifiable risk factors among study group patients compared to the control group?

Procedure methodology:
Administrative design
An official permission for conducting the study at coronary care unit in Benha University Hospitals and Zagazic University Hospitals.Was obtained from the hospital administration by the submission of a formal letter from the Dean of the Faculty of Nursing. Meeting and discussion was held between the researcher and the nursing administration to make them aware about aims and objectives of the study, as well as, to get better cooperation during the implementation phase of the study.Patients were interviewed individually, explanation of purpose and nature of the study was done, confidentiality and voluntary inclusion was assured.

Ethical Consideration
Human rights must be considered by explaining the aim of the study to each participant to be familiar with importance of his or her participation and assured that the information obtained will be confidential and used only for the purpose of the study. An oral approval to carry out the study wasobtained from each Patients and his/her accompanyingcaregiver as well.The researcher will assure maintaining anonymity and confidentiality of objective data. Consent will be taken from the subject that they agree to be included in the study.

Pilot study:
A pilot study was conducted on10% of patients recruited to test the clarity, applicabilityand validityof thetool. To determine the needed time for filling in application to tools. Necessary modifications have been considered. Patients involved in the pilot study will be excluded from the study.

Fieldwork:
Each subject was interviewed to obtain baseline data; pre/post knowledge test was submitted with the help of researcher to subjects of the study group to assess baseline knowledge and level of risk regarding each

modifiable risk factor. Risk assessments were assessed before implementation of the teaching session and one year after study and control group.

Research instrument (tools): Four tools were used to collect study data:

Tool 1: Consist of four items as follows:
Part (a):Demographic variables:An interviewing Questionnaire: It was developed by the researchersto collect baseline data which consist of eight items namely, age, sex, domicile, educational level, occupation, marital status, family size and income per month. **Part (b):**Patients' family medical history which consist of six items namely, present of heart disease, obesity, hypercholesterolemia, hyperglycemia, hypertension and others diseases.**Part (c):** Patients' past medical history which consist of five items namely, years that the patient complaining from heart disease, last time the patient admitted to hospital, the previous investigation made, if the patient had other diseases, if the patient had surgical interventions.**Part (d):**Patients' present medical history which include cause of last pain occurrence and pain characters. The items of this tool adopted from **(Steptoe, et al 1999) and (siero et al 2000)**

Tool 2:Structured interview schedule to assess the presence of modifiable risk factorsamong Patients with heart attack
The toolsconsist of (7 items) to assess the presence of modifiable risk factors among Patients with heart attack namely: hypertension, hyperglycemia, hypercholesterolemia, obesity, sedentary life styles, stress and smokingEach items had score to measure the level of risk of each factor and it was under theheading (0 Not at all), (1 mild)(2 moderate), (3 severe).

Tool 3: follow up tool to record the level of risk factor modified
It was developed by the researchersto record the level of risk factor modified the tool consist of (6 items) namely:blood pressure, blood glucose, cholesterol level, weight, number of cigarettes smoked, number of patients cessase the smoking habit, for both study and control group before and after implantation of the educational program.

Tool 4: Pre and post test tool to assess the effect of the program implementation
This tool was developed by the researcher the tool consist of (44) open end questions were divided under (6) main heading distributed by six teaching session, namely: basic knowledge regarding cardiac function, disease process, diagnostic and treatment modalities, modifiable and non-modifiable risk factorswhich consist of seven items namely, hypertension, diabetes, hypercholesterolemia, smoking, obesity, stress and exercising.
Scoring system: The scoring and interpretation for the program implementation was calculated as each open end question was scored as one mark for every correct point in answer with total score (117) ranked as: 0-58 unsatisfactory, > 58 satisfactory. The content of the program was adopted from**(El-Shreef, 1996), (Khela, 1997), (Mostafaa, 1997), Emam, 2001), (Williams, 2002), and (WHO, 2015).**
An extensive review of literature were carried out aboutQuality of Life and chronic osteomyelitis disease

Statistical analysis
The collected data were tabulated and analyzed using Statistical Package of Social Science (SPSS), version 8.4. A variety of statistical methods were used to analyze the data in this study asnumber and percentagedistribution., , t-test, independent t-test chi square, correlation coefficient. Meanand standard deviationwere used to estimate the statistical significance differencebetween variables of the study.

III. Result
Results of the present study divided into three parts namely, first part deals with sociodemographic characteristics, family history, disease characteristics, history of other chronic illness, investigations done, characteristics of pain, management of pain and instructions given for patients in both study and control group. Second part displays the base line risk factors assessment; illustrate difference between study and control group regarding modifiable risk factors pre and postimplementation of educational program. Third section difference between pre and post implementation of educational program level of risk factors for both control and study group.

Table no (1) shows that, a non-statistical significant difference between study and control group regarding to age, marital status, education, family size and domicile while statistical significant difference was shown between them regarding to gender and occupation.

Table no (1): Number and percentage distribution of the studied subjects according to their socio-demographic Variables (study & control group)

Variables	Group				Chi-square test	p-value
	Study (n=30)		Control (n=30)			
Age in years	Number(N)	Percentage (%)	Number(N)	Percentage (%)		
< 50	07	23.3	8	26.7		
50-	15	50.0	6	20.0		
60+	08	26.7	16	53.3		
Mean ± SD	**54.7±9.2**		**58.6±13.4**		1.32	0.19
Gender Male	24	80.0	15	50.0	5.93	0.01*
Female	6	20.0	15	50.0		
Educational level of patients Illiterate	15	50.0	13	43.3		
Primary	9	30.0	5	16.7	3.29	0.19
Intermediate/high	6	20.0	12	40.0		
Domicile (Living place) Urban	2	93.3	6	20.0	5.93	0.01
Rural	28	6.7	24	80.0		
Marital status Married	28	93.3	25	83.3		
Single / Widow	2	6.7	5	16.7	Fisher	0.42
Occupation Not work (Retired)	13	43.3	18	60.0		
Skilled worker	16	53.3	5	16.7	11.07	< 0.001*
employee	1	3.3	7	23.3		
Family size <5	8	26.7	4	13.3		
5-7	14	46.7	18	60.0	1.83	0.40
8+	8	26.7	8	26.7		
Income (EP) <300 EP	6	20.0	7	23.3		
300- EP	15	50.0	12	40.0	0.61	0.74
500+ EP	9	30.0	11	36.7		

(*) statistically significant at p< 0.05 EP =Egyptian pound.

Table no (2)reveals that there is no significant difference between study and control group regarding family history of heart disease, diabetes, obesity and other illnesses.

Table no 2: Family history of patients in the study and control group

Family history	Group				Chi-square test	p-value
	Study (n=30)		Control (n=30)			
	Number(N)	Percentage (%)	Number(N)	Percentage (%)		
Heart disease None	20	66.7	24	80.0		
Parents	3	10.0	3	10.0		
Brother/sister	4	13.3	1	3.3	1.36	0.24 **NS**
Son/daughter	1	3.3	0	0.0		
Siblings	2	6.7	2	6.7		
Diabetes None	19	63.3	22	73.3		
Parents	3	10.0	3	10.0		
Brother/sister	6	20.0	2	6.7	0.69	0.41 **NS**
Son/daughter	0	0.0	1	3.3		
Siblings	2	6.7	2	6.7		
Obesity None	26	86.7	29	96.7		
Parents	0	0.0	1	3.3		
Brother/sister	3	10.0	0	0.0	Fisher	0.35 **NS**
Son/daughter	1	3.3	0	0.0		
Other illness None	21	70.0	22	73.3		

Parents	3	10.0	8	26.7	0.08	0.78
Brother/sister	4	13.3	0	0.0		**NS**
Siblings	2	6.7	0	0.0		

NS= Non Significant

Table no 3 reveals that;a non-statistical significant difference between study and control group regarding duration of disease and admission frequency.

Table no (3) Number and percentage distribution of the studied subjects according to their history of the disease (study & control group)

	Group				Chi-square test	P-value
	Study (n=30)		**Control (n=30)**			
	Number(N)	**Percentage (%)**	**Number(N)**	**Percentage (%)**		
Duration First attack	13	43.3	5	16.7	5.17	0.08
<1y	6	20.0	10	33.3		
>1y or more	11	36.7	15	50.0		
Admission frequency First time	11	36.7	10	33.3	--	--
2	17	56.7	17	56.7		
3 or more	2	6.7	3	10.0		

(--) Statistical test not valid

N.B. For all statistical tests done; P value > 0.05 insignificant, P value < 0.05 significant, P value < 0.01 highly significant and P value < 0.001 very highly significant.

Table no 4shows that a non-statistical significant difference between study and control group regarding their history of other chronic diseases (hypertension, diabetes, renal, hypercholesterolemia, valvular disease) and surgery

Table no (4) Number and percentage distribution of the studied subjects according to their history of other chronic diseases and surgery (study & control group)

	Group				Chi-square test	p-value
	Study (n=30)		**Control (n=30)**			
	Number(N)	**Percentage (%)**	**Number(N)**	**Percentage (%)**		
Hypertension	18	60.0	20	66.7	0.29	0.59
Diabetes	15	50.0	13	43.3	0.27	0.60
Renal	1	3.3	0	0.0	Fisher	1.00
Hypercholesterolemia	1	3.3	1	3.3	Fisher	1.00
Valvular disease	0	0.0	1	3.3	Fisher	1.00
Had previous surgery	14	46.7	17	56.7	0.60	0.44

Table no 5shows that there is nosignificant difference found in investigations done to patients in the study and control group regarding to X-ray, blood picture, nuclear scan, cardiac catheterization, and stress test. While statistical significant difference was show between them regarding to ECG in previously investigations done but currently investigations done was shown a non-statistical significant difference between them regarding to blood picture, urine analysis, X-ray, ECG, stress test, Echo andcardiac catheterization.

Table no(5): Number and percentage distribution of the studied subjects regarding investigations done (Study& control group)

Investigations done	Group				Chi-square test	p-value
	Study (n=30)		**Control (n=30)**			
	Number(N)	**Percentage (%)**	**Number(N)**	**Percentage (%)**		
Previously ECG	14	46.7	22	73.3	4.44	0.04[*]
X-ray	4	13.3	4	13.3	Fisher	1.00

Blood picture	1	3.3	6	20.0	Fisher	0.10
Nuclear scan	0	0.0	1	3.3	Fisher	1.00
Cardiac catheterization	3	10.0	2	6.7	Fisher	1.00
Stress test	2	6.7	0	0.0	Fisher	0.49
Currently						
ECG	30	100.0	28	93.3	Fisher	0.49
X-ray	29	96.7	24	80.0	Fisher	0.10
Blood picture	30	100.0	30	100.0	0.00	1.00
Stress test	5	16.7	4	13.3	Fisher	1.00
Echo	23	76.7	23	76.7	0.00	1.00
Cardiac catheterization	4	13.3	3	10.0	Fisher	1.00
Urine analysis	22	73.3	17	56.7	1.83	0.18

(*) statistically significant at p < 0.05

Table no 6 reveals that;a non-statistical significant difference between study and control group regarding totiming, site of pain, severity, character,radiation to another site, duration, frequency, and while associated symptoms shows statistical significant difference between study and control group regarding touneasiness and sweating but the other symptoms remain nosignificant difference between them.

Table no(6): Number and percentage distribution of the studied subjects regarding characteristics of chest pain

The nature of pain	Group				Chi-square test	p-value
	Study (n=30)		Control (n=30)			
	Number(N)	Percentage (%)	Number(N)	Percentage (%)		
Timing of pain Irregular	0	0.0	1	3.3	Fisher	1.00
At rest	10	33.3	17	56.7	3.30	0.07
During sleep	3	10.0	4	13.3	Fisher	1.00
After effort	13	43.3	7	23.3	2.70	0.10
After stress	4	13.3	3	10.0	Fisher	1.00
After meals	0	0.0	0	0.0	0.00	1.00
Site of pain Right side	16	53.3	11	36.7	1.68	0.19
Left side	19	63.3	25	83.3	3.07	0.08
Above diaphragm	0	0.0	0	0.0	0.00	1.00
Below nipple	2	6.7	3	10.0	Fisher	1.00
Other	0	0.0	1	3.3	Fisher	1.00
Severity Very mild	0	0.0	1	3.3	--	--
Mild	1	3.3	4	13.3	--	--
Sever but bearable	25	83.3	19	63.3	--	--
Unbearable	4	13.3	6	20.0	--	--
Character of pain Heaviness	14	46.7	12	40.0	0.27	0.60
Constrictive	3	10.0	5	16.7	Fisher	0.71
Stitching	5	16.7	6	20.0	0.11	0.74
Pressing	2	6.7	3	10.0	Fisher	1.00
Other	8	26.7	7	23.3	0.09	0.77
Radiation Right shoulder	1	3.3	0	0.0	Fisher	1.00
Left shoulder	4	13.3	8	26.7	1.67	0.20
Neck	7	23.3	6	20.0	0.10	0.75
Back	20	66.7	15	50.0	1.71	0.19
Mandible	1	3.3	1	3.3	Fisher	1.00
Other	0	0.0	0	0.0	0.00	1.00
Duration of pain 10-15 minutes	30	100.0	28	93.3		
Longer	0	0.0	2	6.7	Fisher	0.49
Frequency of pain 1-2/day	29	96.7	22	73.3	--	--
3	1	3.3	7	23.3	--	--
More	0	0.0	1	3.3	--	--
Associated symptoms Dyspnea	24	80.0	20	66.7	1.36	0.24
Palpitation	0	0.0	1	3.3	Fisher	1.00
Sweating	24	80.0	10	33.3	13.30	< 0.001*
Headache	5	16.7	7	23.3	0.42	0.52
Pallor	1	3.3	1	3.3	Fisher	1.00

Nausea	0	0.0	3	10.0	Fisher	0.24
Dizziness	14	46.7	11	36.7	0.62	0.43
Uneasiness	0	0.0	6	20.0	Fisher	0.02*
Other	7	23.3	4	13.3	1.00	0.32

(*) statistically significant at p < 0.05   (--) Statistical test not valid

Table no 7shows that there is nosignificant difference between study and control group regarding management of chest pain. It also showed that (46.7%) of study group is going to hospital while (53.3%) of controls group are taking sublingual tablets as a management of chest pain.

Table no(7): Number and percentage distribution of the studied subjects regarding management of chest pain

	Group				Chi-square test	p-value
	Study (n=30)		Control (n=30)			
	Number(N)	Percentage (%)	Number(N)	Percentage (%)		
Management Sublingual tablets	12	40.0	16	53.3	1.07	0.30
Bed rest	2	6.7	7	23.3	Fisher	0.15
Sedatives	13	43.3	8	26.7	1.83	0.18
Going to hospital	14	46.7	10	33.3	1.11	0.29
Other	1	3.3	1	3.3	Fisher	1.00
Medications changed Yes	2	6.7	3	10.0	Fisher	1.00
No	28	93.3	27	90.0		

Table no 8 reveals that;a non-statistical significant difference between study and control group regarding to instruction given by health professions in respect of all items of patient education except treatment, side effects and regular follow up, there is a highly statistical significant difference.

Table no(8): Number and percentage distribution of the studied subjects regarding instruction given by health professions

	Group				Chi-square test	p-value
	Study (n=30)		Control (n=30)			
	Number(N)	Percentage (%)	Number(N)	Percentage (%)		
Health professions instructions: Nature of illness	0	0.0	4	13.3	Fisher	0.11
Means of communication in case of problems	0	0.0	5	16.7	Fisher	0.05
Treatment and side effects	3	10.0	19	63.3	18.37	<0.001*
Role of patient after discharge	0	0.0	4	13.3	Fisher	0.11
Regular follow-up	2	6.7	28	93.3	45.07	<0.001*
Benefits of regular checkup	0	0.0	3	10.0	Fisher	0.24
Sound nutrition	1	3.3	3	10.0	Fisher	0.61

Table no 9 reveals that; a non-statistical significant difference between study and control group regarding to all modifiable risk factors such as hypertension, hypercholesterolemia, diabetes, obesity, smoking and exercise, while there was a significant difference between two groups regarding stress. It was noticed that non of the patients in either of the two groups had no risk of hypertension, diabetes and stress.

Table no(9): Number and percentage distribution of the studied subjects regarding risk assessment of modifiable risk factors

Risk assessment	Group				Chi-square test	p-value
	Study (n=30)		Control (n=30)			
	Number(N)	Percentage (%)	Number(N)	Percentage (%)		
Hypertension Moderate	7	23.3	7	23.3	0.00	1.00
High	23	76.7	23	76.7		
Hypercholesterolemia No	12	40.0	11	36.7	0.37	0.83
Moderate	12	40.0	11	36.7		

High	6	20.0	8	26.7		
Diabetes Moderate	19	63.3	18	60.0	0.07	0.79
High	11	36.7	12	40.0		
Obesity No	0	0.0	2	6.7		
Moderate	17	56.7	18	60.0	2.42	0.30
High	13	43.3	10	33.3		
Smoking No	9	30.0	19	63.3		
Moderate	0	0.0	2	6.7	--	--
High	21	70.0	9	30.0		
Exercise No	27	90.0	25	83.3		
Moderate	0	0.0	1	3.3	3.46	0.18
High	3	10.0	4	13.3		
Stress level None	1	3.3	8	26.7		
Low	1	3.3	7	23.3	25.56	<0.001*
Moderate	23	76.7	4	13.3		
High	5	16.7	11	36.7		

(--) Statistical test not valid

Table no 10shows that there is nosignificant difference between study and control group regardingto blood pressure, blood sugar, serum cholesterol level and body weight.

Table no(10): Pre- program implementation levels of blood pressure, blood sugar, serum cholesterol and body weight among patients in the study and control groups.

	Group			
	Study (n=30)	**Control (n=30)**	**t-test**	**p-value**
Systolic blood pressure	160.2±27.1	162.7±29.4	0.34	0.73
Diastolic blood pressure	89.8±14.0	91.2±16.7	0.33	0.74
Blood sugar	234.7±117.7	203.5±103.6	1.09	0.28
Serum cholesterol	224.2±56.7	233.4±64.2	0.59	0.56
Body weight	95.3±11.1	91.4±13.3	1.26	0.21

(*) Statistically significant at p<0.05

Table no 11shows that there is nosignificant difference between study and control group regardingto exercise, while statistical significant difference was shown between them regarding smoking and number of cigarettes. Pre intervention of the study educational program

Table no(11): Number and percentage distribution of the studied subjects regarding Pre- program implementation prevalence of smoking, exercise and stress

	Group				Chi-square test	p-value
	Study (n=30)		**Control (n=30)**			
	Number(N)	**Percentage (%)**	**Number(N)**	**Percenta ge (%)**		
Smoking: Yes	21	70.0	11		6.70	0.01*
No	9	30.0	19			
Number of cigarettes /day (for smokers)	24.8±22.9		12.3±21.4		T=2.18	0.03*
Exercising: Yes	3	10.0	5	16.7	Fisher	0.71
No	27	90.0	25	83.3		
Stress level: High	0	0.0	8	26.7		
Moderate	0	0.0	13	43.3	--	--
Low	29	96.7	1	3.3		
None	1	3.3	8	26.7		

(*) Statistically significant at p<0.05

Table no 12 reveals that; ahighly statistical significant difference between study and control group regardingto blood pressure, blood sugar, serum cholesterol level and body weight post intervention of the study educational program.

Table no(12): Post- program implementation levels of blood pressure, blood sugar, serum cholesterol and body weight among patients in the study and control groups. (Hypothesis I)

	Group		t-test	p-value
	Study (n=30)	**Control (n=30)**		
Systolic blood pressure	134.3±15.6	159.3±27.9	4.28	<0.001*
Diastolic blood pressure	76.5±10.4	91.5±15.5	4.41	<0.001*
Blood sugar	127.9±37.7	210.3±119.4	3.61	<0.001*
Serum cholesterol	173.8±22.5	254.3±73.3	5.76	<0.001*
Body weight	83.9±9.3	92.9±11.7	3.30	<0.001*

(*) Statistically significant at p<0.05

Table no 13 reveals that; a statistical significant difference between study and control group regardingtosmoking habit and exercising.

Table no(13): Number and percentage distribution of the studied subjects regarding Post-program implementation prevalence of smoking, exercise and stress (hypothesis I)

	Group				Chi-square test	p-value
	Study (n=30)		**Control (n=30)**			
	Number(N)	**Percentage (%)**	**Number(N)**	**Percentage (%)**		
Smoking: Yes	2	6.7	11	36.7	7.95	0.005*
No	28	93.3	19	63.3		
Number of cigarettes /day (for smokers)	3.6±18.1		13.8±22.2		T=1.95	0.06
Exercising: Yes	30	100.0	5	16.7	42.86	<0.001*
No	0	0.0	25	83.3		
Stress level: High	0	0.0	8	26.7		
Moderate	0	0.0	13	43.3	--	--
Low	29	96.7	1	3.3		
None	1	3.3	8	26.7		

(*) Statistically significant at p<0.05   **(--) Statistical test not valid**

Table no 14shows thata statistical significant difference pre and post program intervention regarding to level of blood pressure, blood sugar, serum cholesterol and body weight in the study groupsubjects.

Table no(14): Pre and post program implementation levels of blood pressure, blood sugar, serum cholesterol and body weight among patients in the study group. (Hypothesis II)

	Time		t-test	p-value
	Pre (n=30)	**Post (n=30)**		
Systolic blood pressure	160.2±27.1	134.3±15.6	4.53	<0.001*
Diastolic blood pressure	89.8±14.0	76.5±10.4	4.17	<0.001*
Blood sugar	234.7±117.7	127.9±37.7	4.73	<0.001*
Serum cholesterol	224.2±56.7	173.8±22.5	4.53	<0.001*
Body weight	95.3±11.1	83.9±9.3	4.31	<0.001*

(*) Statistically significant at p<0.05

Table no 15shows thata statistical significant difference pre and post program implementation regarding to smoking habit, number of cigarettes (for smokers) and exercising in the study group subjects.

Table no(15): Number and percentage distribution of the study group regarding pre and Post-program implementation prevalence of smoking, exercise and stress (hypothesis II)

	Time				Chi-square test	p-value
	Pre (n=30)		**Post (n=30)**			
	Number(N)	**Percentage (%)**	**Number(N)**	**Percentage (%)**		
Smoking: Yes	21	70.0	2	6.7	25.45	<0.001[*]
No	9	30.0	28	93.3		
Number of cigarettes /day (for smokers)	24.8±22.9		3.6±18.1		T=3.98	<0.001[*]
Exercising: Yes	3	10.0	30	100.0	49.09	<0.001[*]
No	27	90.0	0	0.0		
Stress level: High	5	16.7	0	0.0		
Moderate	23	76.7	0	0.0	--	--
Low	1	3.3	29	96.7		
None	1	3.3	1	3.3		

(*) Statistically significant at p<0.05   **(--) Statistical test not valid**

Table no 16 reveals that;there was a non- statistical significant difference pre and post program implementation among control group regarding blood pressure, blood sugar,Serum cholesterol and body weight.

Table no(16): Pre and post program implementation levels of blood pressure, blood sugar, serum cholesterol and body weight among patients in the control group.

	Time		t-test	p-value
	Pre (n=30)	**Post (n=30)**		
Systolic blood pressure	162.7±29.4	159.3±27.9	0.45	0.65
Diastolic blood pressure	91.2±16.7	91.5±15.5	0.09	0.93
Blood sugar	203.5±103.6	210.3±119.4	0.24	0.81
Serum cholesterol	233.4±64.2	254.3±73.3	1.18	0.24
Body weight	91.4±13.0	92.9±11.7	0.48	0.63

Table no 17shows thata statistical significant difference pre and post program implementation regarding to stress level among patients in the control group.

Table no (17): Number and percentage distribution of the control group regarding pre and Post-program implementation prevalence of smoking, exercise and stress

	Time				Chi-square test	p-value
	Pre (n=30)		**Post (n=30)**			
	Number(N)	**Percentage (%)**	**Number(N)**	**Percentage (%)**		
Smoking: Yes	11	36.3	11	36.7	0.00	1.00
No	19	63.3	19	63.3		
Number of cigarettes /day (for smokers)	12.3±21.4		13.8±22.2		T=0.27	0.79
Exercising: Yes	5	16.7	5	16.7	0.00	1.00
No	25	83.3	25	83.3		
Stress level: High	11	36.7	8	26.7		
Moderate	4	13.3	13	43.3	9.74	0.02[*]
Low	7	23.3	1	3.3		
None	8	26.7	8	26.7		

(*) Statistically significant at p<0.05

Table no 17 showed that, a highly statistical significant difference regarding to study group subjects' knowledge pre and Post-program implementation.

Table no(17): Number and percentage distribution among patientsin the study group regarding pre and Post-program implementation related to knowledge about ischemic heart disease

Risk assessment	Time				Chi-square test	p-value
	Pre (n=30)		Post (n=30)			
	Number(N)	Percentage (%)	Number(N)	Percentage (%)		
Anatomy: Satisfactory	1	3.3	30	100.0	56.13	< 0.001*
Unsatisfactory	29	96.7	0	0.0		
Cause: Satisfactory	27	90.0	30	100.0	Fisher	0.24
Unsatisfactory	3	10.0	0	0.0		
Diagnosis: Satisfactory	0	0.0	29	96.7	56.13	< 0.001*
Unsatisfactory	30	100.0	1	3.3		
Risk factors: Satisfactory	1	3.3	30	100.0	56.13	< 0.001*
Unsatisfactory	29	96.7	0	0.0		
Smoking/obesity: Satisfactory	0	0.0	30	100.0	60.0	< 0.001*
Unsatisfactory	30	100.0	0	0.0		
Stress/Exercise: Satisfactory	0	0.0	30	100.0	60.00	< 0.001*
Unsatisfactory	30	100.0	0	0.0		
Total knowledge: Satisfactory	0	0.0	30	100.0	60.00	< 0.001*
Unsatisfactory	30	100.0	0	0.0		

(*) **Statistically significant at p<0.05**

IV. Discussion

The present study aims to study the impact of health education designed to heart attack's patients having risk factors and to achieve this aimone research question were formulated; does the educational program result in significant reduction in modifiable risk factors among study group patients compared to the control group?This discussion of the results will be presented in three sections;First section will high light the socio-demographic characteristics,family history, disease characteristics, history of other chronic illness, investigations done, characteristics of pain, management of pain and instructions given for patients in both study and control group.,the second section will conducted the studying of modifiable risk factors among patients in the study and control groups' pre and post of implementation of the educational program, Third section will concerned with the difference between pre, post and follow up program scores of the study group.

I- Demographic characteristics, Medical history & physical examination of the sample:

Heart attack's considered as a major health problem in different parts of the world and threatens peoples' health. Its morbidity and mortality stand high as compared to many other serious diseases**Pollock (2013)**.Our study shows no statistical significant difference was shown between two groups regarding age, marital status, level of education, family size, income, family history, duration of illness, their history of other chronic diseases or surgical interventions and chest pain which confirm the compatibility of the two group, the study also revealed that a mean age of the study group and the control group which is in agreement with **lawlor (2011)**who reported the prevalence rate of heart diseases.Referring to the number of males was two third the studied group as compared to female subjects, but it could not be ignored that this small female number may convey that the women are at high risk for heart attacks' development after forty years,This analysis is in agreement with previous studies by **Stevenson et al., (2014)**who stated that women lose their relative protection at menopause when decreased estrogen production causes a gradual rise in cholesterol level (LDL) (low density of lipoprotein).Also **Hatchett et al., (2015)**mentioned thatmen are at significantly greater risk for heart attack' than women, the difference progressively declining with advancing age. The current study revealed that more than half of the study group subjects were skilled workers whose job require a rather mental effort than physical effort, this may explain the role of physical inactivity as a risk factor for heart attack this finding is supported by**Brian et al., (2014)**who stated thatthe physical fitness is an integrated measure of cardiorespiratory and neuromusculo-skeletal function,oxygen transport and delivery and psychological drive. Accordingly, high physical fitness requirethat all these important body functions function normally, while low physical fitness suggests malfunction of one or more of them.As to who affected from family member by heart attack our study shows one third of the study group sample and one fifth of the controls had one or more family member who affected by heart attacks',this may spot the light on the role of positive family history on development of heart

attacks' in other family member.This finding in contrast with**Cohn et al.,(2014)**whois reported that,there was no any association between family history of premature heart diseases before the age of [50 years]and risk of heart attack after controlling other risk factors. There is controversy in another study by **Chan (2011)**who stated that family history of heart diseases may influence atheroscleroticrisk early in infancy, their studies on 136 infants aged less than one year, main luminal narrowing in the left coronary artery was 1.4 times greater in infants with a family history of coronary artery diseases than in infants with no family history of coronary artery diseases, which was a statistically significant difference.

II- Modifiable risk factors among two groups'pre and post of implementation of the educational program of patients with heart attacks:

The study revealed that, before implementation of the program no significantassociation between the two groups   regarding most of the modifiable risk factors that are (systolic and diastolic blood pressure, blood sugar, serum cholesterol, body weight, smoking and exercising) which reflects the role played by education in reducing the modifiable risk factors for heart attacks**Ahmed (2004)**, while after implementation of the program, there wasstatistically significant difference and the levels of modifiable risk factors were improve among study group subjects compared to the control groups, **hypothesis (1).**This finding is supported by**Ahmed (2004)and Hampton (2013)**who stated that a statistical significantdifference between two groups afterimplementation of the educational program regarding modifiable risk factors for coronary artery disease patients.**Hypothesis (2),** in the present studyrevealed that, after implementation of the program, the levels of modifiable risk factors among study group subjects will improve compared to their level before implementation of the program. Thisanalysis is in agreement with**Wallace et al., (2015).**

III- Difference between pre, post and follow up program scores of the study groups:

The present study showed that astatistical significantdifference between pre, post program implementation for levels of modifiable risk factors for the study groups' sample while there isno statistically significant difference was found pre and post program implementation regarding to levels of most of modifiable risk factors for control group sample which confirmthe role of health education in modifying the modifiable risk factors of heart attacks.This analysis is in agreement with**Hampton, (2013)**who stated that the patient who has not been provided with adequate educational care can no longer be considered adequately treated, also he added the lack of information increases patients' anxiety and frustration. Also this finding supported by**Lukkarinen, (2015)**who reported thatby following the health education program of exercise, low fat diet, group support and stress management the majority of patients reversed their atherosclerotic blockages while the majority of patients in a control group either got worse or showed no change.

V. Conclusion

The studyconcluded that patient education affect positively in reducing modifiable risk factors for study group as compared to the control group.

VI. Recommendations

Recommendations based up on this study, the findings of the present study have several implications in the field of the patient education, nursing administration and nursing research. Health care personnel should be given an opportunity to update their knowledge regarding cardiovascular disease. Each hospital must provide continuous patient educational program for patients with cardiovascular disease to acquire and develop the knowledge needed to modification the modifiable risk factors through central television, videos in waiting areas or outpatient clinics. Each coronary care unit must be design pamphlets, booklets for patient with cardiovascular diseases to increased patients' information and advice. Alternative strategies should be employed to support patient educational program in modifying patient risk factors, reduce readmissions, minimize complications and improving the patient quality of life.

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