Effect of Cardiac Rehabilitation Program on Lifestyle Pattern of Patients with Myocardial Infraction

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Abstract

Cardiovascular disorders are the leading cause of mortality and morbidity in the industrialized world, accounting for almost 50% of all deaths annually. The survivors constitute an additional reservoir of cardiovascular disease morbidity. In the United States alone, over 14 million persons suffer from some form of coronary artery disease (CAD) or its complications. Traditionally, cardiac rehabilitation has been provided to somewhat lower-risk patients who could exercise without getting into trouble. So, this study aimed to examine the effect of the cardiac rehabilitation program on lifestyle practices by patients with myocardial infarction. **Settings.** The study was conducted at the cardiac ICU and coronary care unit of the Main University Hospital at Mansoura University. **Subject.** The study included a convenience sample of 50 adult patients admitted to the previously mentioned settings during the study period and having (M.I). we included in this study patients from both sex, adult less than 60 years. **Results**, Finding of the present study revealed that, there was highly statistical significant positive change in lifestyle pattern of patients with myocardial infarction to control the physiological problems associated with the disease and medications received after implementation of the cardiac rehabilitation program.

Keywords: Cardiac rehabilitation, myocardial infarction, compilations, lifestyle practice.

Introduction

Cardiovascular disease (CVD), has a significant impact on morbidity and mortality rates in the United States and can affect anyone, including those who may be considered physically fit (Lloyd, etal 2010). Also in the Eastern Mediterranean region (Bahrain, Cyprus, Egypt, Iran, Iraq, Jordan, Kuwait, Oman, Qatar and the United Arab Emirates), cardiovascular diseases are emerging as a major health problem. The proportion of deaths from cardiovascular disease ranges from 25 to 45% (World Health Organization, 2009).

Myocardial infarction (MI) is one of the major health problems worldwide, as it refers to a process by which areas of myocardial cells in the heart are permanently destroyed, and it is considered a serious medical event, It often requires substantial changes in a patient's life in order to prevent future recurrence (Smeltzer, 2003). In order to achieve these goals, patients and families should educate themselves about cardiac health, work with their physicians, and adhere to all prescribed medication and lifestyle therapies (Van Dam, etal. 2008).

Myocardial infarction (MI) represents the quintessential lifestyle disease of developed countries. Six of the major risk factors for developing MI involve lifestyle practices, including the decision of whether or not to smoke, the control of blood pressure and lipids, diabetes, level of physical activity, and obesity (James, etal. 2005).

The National Institute for Health and Clinical Excellence (NICE) guidelines recommend delivery of these lifestyle changes through cardiac rehabilitation programs that are accessible and relevant to all post-MI patients (National Institute for Health and Clinical Excellence, 2007). However, implementation of such programs is inconsistent despite the evidence that rehabilitation reduces cardiac mortality by 27% and has other significant morbidity and quality-of-life benefit (Taylor, etal. 2004).

Cardiac rehabilitation is the process by which a person who is suffering from ischemic heart disease, or who has had a myocardial infarction (MI), is encouraged to achieve their full potential in terms of physical and psychological health (Cardiac rehabilitation, Scottish Intercollegiate Guidelines, 2002 & Williams, etal. 2004). cardiac rehabilitation which includes programs of structured exercise is now generally believed not only to improve morbidity but also to reduce mortality in patients who have suffered an MI (Jolliffe, etal. 2001).

Rehabilitation is aimed at restoring the patient to as full a life as possible, including return to work. It must take into account physical, psychological, and socio-economic factors. Rehabilitation should be offered to all patients after MI. The process should start as soon as possible after hospital admission, and be continued in the succeeding weeks and months (Jackson, 2005).

Cardiac rehab programs usually provide education and counseling services to help heart patients increase physical fitness, reduce cardiac symptoms, improve health and reduce the risk of future heart problems, including heart attack. Counseling and education can help patient to quit smoking, eat right, lose weight, and

lower your blood pressure and cholesterol levels. Counseling may also help patient learn to manage stress and to feel better about health (*Thompason, &Lewin, (2000)*.

Therapeutic lifestyle changes (TLCs) are the foundation of nonpharmacologic management of patients with MI and/or CVD, including dietary change and exercise *(Randell Wexle, etal.2012 &* Chobanian*,2003)*. Therapeutic lifestyle changes include a reduced-sodium diet, the Dietary Approaches to Stop Hypertension (DASH) diet, weight loss, moderation of alcohol consumption, and increased aerobic exercise (Stampfer, 2000).

The rehabilitation nurse can play a vital role in establishing the value of cardiac rehabilitation program as a form of preventive care that lead to an improved quality of life for MI patients, reduce the length of hospital stay, hospital costs and the risk of readmission to hospital (Grange, 2005 & Blue, etal. 2001).

The nurse plays a crucial role in helping patients to learn or relearn lifestyle practice, as focusing on the patient's response to health and illnesses rather than on the disease it self. When illness or injury interfere with the ability to perform self-care, the nurse assists or performs tasks that the patient can not manage, or offers support to family members or other caregivers. However, the main goal is to help patient's achievement as much independence in self care as possible (Rabelo, etal.2007).

The hospital setting is becoming increasingly recognized area where early detection of possible health risk factors is highlighted and appropriate health promotion strategies are implemented. Thus, this study will clarify lifestyle practices for patients with M.I that aid patients as well as other health care providers in management of physiological problems associated with the disease and medications received, which on the other hand decrease patient's suffering and hospital stay (European Society of Cardiology. 2008).

Aim: The aim of this study was to study the effect of the cardiac rehabilitation program on lifestyle practices by patients with myocardial infarction.

Hypothesis: cardiac patients who exposed to rehabilitation program will improve positively in life style practices.

Method

Design: quasi experimental research design to examine the effect of cardiac rehabilitation program on lifestyle pattern of MI patients

Settings: The study was conducted at the cardiac ICU and coronary care unit of the Main University Hospital at Mansoura University.

Subject: The study included a convenience sample of 50 adult patients admitted to the previously mentioned settings during the study period and having (M.I). we included in this study patients from both sex, adult less than 60 years, and included criteria at the following (having myocardial infarction, adults of both sex, and having the willing to participate in the study and attend all the program sessions; and excluding patients with audio and visual deficits, and patients who don't accept to participate in the program

Tools: A Structured interview questionnaire sheet was developed to collect data of the study. It was developed by the researcher and derived from *(*European Society of Cardiology. 2008, & Lloyd, etal 2010).

The questionnaire sheet comprising two parts as the following:

The first part included assessment of socio- demographic characteristics of the patients such as: (age, gender, marital status, educational level, job characteristics, economic, and residence characteristics.

The second part included lifestyle pattern of patients to control physiological problems associated with the disease and medications received. It included five section, the first section involved questions about the nutrition, such as eat breakfast regularly, daily balanced meals, avoid high fat diet, and Decrease salt and salty food. The second section involved questions about the activity and exercise, such as regular exercise, 15-30 min, 3times/week, determine signs & symptoms of exercise limitation, and perform ROM & breathing exercises at home. The third section of the questionnaire asked about medical follow up. The fourth section included questions to assess the health management skills such as daily pulse measurement, daily blood pressure measurement, and respiration measurement. The fifth and six section consisted of 12 questions to assess level of anxiety and emotional condition.

Each question is scored on a scale of 1-3, with the high score means best lifestyle pattern.

Cardiac rehabilitation program was developed depending on the (European Society of Cardiology, 2008). and the (American Heart Association rehabilitation program,2009). for training patients with (M.I) to care for themselves at home. The program included knowledge about the disease, methods used to control risk factors, lifestyle pattern used to manage physiological problems associated with the disease and medications received.

Operational design

1-Preparatory phase:

After extensive literature review, tools for data collection were adopted. An official permission for

conducting the study was obtained from the directors of the chosen setting and research ethics committee at my faculty .

The questionnaire was translated in Arabic language by the researcher and tested by five jury for its content validity. A written handout of the content of the educational sessions were done and revised by three cardiologists and three nurses educator. Meeting patients and explaining the aim of the study and components of the tools prior to start the interview and obtaining informed consent from the patients**.**

2-Pilot study:

A pilot study for data collection was carried out to test whether the tools are clear, understandable, arrangeable, feasible, applicable, and time consuming on ten percent from the total sample size (five patients). Those patients were excluded from the study.

3-Field work:

The data were collected throughout four phases .

The first phase (assessment phase):

* Assess patients condition according to inclusion and exclusion criteria, after introduced the researcher herself for the patients and explained the objectives of the program.

• Data were collected during 6 months from (April 2011 to September 2011). At the pre-program period; each patient was interviewed individually by the researcher to complete the questionnaire sheet. Depending on patient's needs that specified at the pre-test period tailor the content of the educational sessions, .

• The time took for filling the questionnaire from every patients about one and half an hour .

The second phase (planning phase) :

Based on the assessment phase , the researcher prepared and established the cardiac rehabilitation program after reviewing the literature and take the acceptance of expert jury for all the content of rehabilitation program and this program cover for all needs of cardiac patients.

The third phase (Implementation phase):

In this phase the researcher started to apply the rehabilitation program to myocardial infarction patients through small sessions to cover the content and objectives of the program this sessions divided to 6 sessions through 3 days, two sessions per day (one sessions at the morning and one at the evening), with every session lasted from 30-45 minutes. Patient was educated on individual base and was explained very concise and in a simple manner. At the end of the program sessions, every patient received a written handout of contents of the educational sessions and the outcome of cardiac rehabilitation program was evaluated before patient's discharge.

The forth phase of evaluation :

After one month from   patient's discharge a follow up appointment was determined to evaluate the continuing effect of cardiac rehabilitation on the lifestyle pattern followed by patients.) After one month from starting the program implementation, the patients were interviewed to complete the questionnaire sheet with the purpose of estimating the effect of the cardiac rehabilitation program on the lifestyle pattern followed by patients to manage physiological problems associated with the disease and medications received (post-test).

Teaching methods:

• Rehabilitation program was developed by the researcher after determining the patients' needs and review of related literature. It was applied through patients teaching sessions using question, discussion, demonstration and uses of flip chart.

• The media which used includes: illustrative pictures; video tape and   hand outs which made in a suitable manner for educated and illiterate patients and given for every patients as a gift.

Ethical Considerations:

The study was approved by the ethical review committee of the Faculty of Nursing affiliated to the University from which data were collected. Human Rights were considered by explaining the aim of the study, and assured that the obtained information will coded, used in confidential manner, and only for the research purpose. Patients' consent were taken after explaining to the patients that they have the opportunity to refuse participation in the study.

Statistical Analysis: Data are tabulated using SPSS software version 10. Descriptive statistic was presented as mean and standard deviation. Analytic test included chi-square or Fischer's exact test $(X2)$ for comparing of means between before and after the program. Significant level of 0.05 was used through-out all statistical tests within this study, p-value <0.05 indicated significant results. The smaller the p-value obtained the more significant was the result.

Results

Demographic data for patients are demonstrated in Table (1), it showed that, the patient's age ranging

from 30 to 65 years old with mean age 54.62 10.1 years. Nearly two thirds of the patients (68%) were males, and two thirds of the patients also (64%) were married. In addition, nearly two fifths (36%) of the patients were middle education. Three fifths (60%) of patients were working. Slightly less than half of the working patients (46.7%) have technical work, half of the working patients (50%) working for more than 8 hours daily. Moreover, the disease is the leading cause of not working in slightly less than three quarters of the studied patients (70%).

As presented in table (2) the majority of the patients (70%) have reported that the family monthly income is enough for living. Nearly two thirds of the patients (66%) depend on their monthly income to afford their medication. Nearly three quarters of the patients (70%) were from urban areas. Three quarters of the patients (74%) were living in the ground and first floor. In addition, nearly two thirds of the studied patients' homes (66%) were scored to have high level home characteristics

Table (3) showed that, most of the patients (84%) were complaining of the disease from 1 to less than 5 years ago. And most of the patients (90%) have co-morbid diseases. The most common co-morbid condition was smoking and diabetes mellitus in more than half of the patients (77.8%, 66.7%) respectively, then hypertension in slightly less than half of the patients (46.7%).

Table (4) showed that more than half of the patients (58%) always eat breakfast regularly, and daily balanced meals before the program implementation, but after the program most of the patients (94%) always following the same lifestyle pattern. Before the program implementation only (2%) of the patients always avoid high fat diet, decrease salt and salty food, and decrease intake of sugar and sweets. But after the program implementation around half of the patients (42%, 62%, 50%) always following the same lifestyle pattern accordingly, which mean high significant improvement after the program implementation.

In addition, Table (4) showed high significant positive change after the program implementation in perform regular exercise, 15-30 min, 3times/week, perform ROM & breathing exercises at home, and maintain walking exercise when too busy with other activities.

As demonstrated in table (5) only (2%) of the patients were always regular daily pulse measurement, and regular daily respiration measurement before the program.   Also nearly one fifth of the patients (12%) were determining methods of stopping smoking, and daily measurement of body weight before the program implementation, but after the program nearly third fifth of the patients (60%, 62%) respectively always following the same lifestyle pattern, which mean high significant improvement after the program implementation.

Table (6) can be noticed that lifestyle pattern of studied patients for coping with stressors as feeling accumulation of problems, feeling more nervous than others, always worried about health, and having good relations with peers, neighbors increased significantly after cardiac rehabilitation (p= 0.001, 0.038, 0.001, 0,003) respectively.

Furthermore, lifestyle pattern of studied patients were significantly higher after cardiac rehabilitation for coping with emotional situations of feeling happy and satisfied, feel self satisfaction, feel ambitious and optimistic, and control self in anger (p= < 0.001, <0.001, < 0.001, < 0.001) respectively.

On the other hand, table (7) showed that lifestyle pattern of studied patients for changing to healthy cardiac diet and performing exercise were still significant after one month of patients discharge.

From table (8) can be observed high significant positive change after one month of patients discharge related to determine methods of stopping smoking (p= <0.001). Moreover, lifestyle pattern of studied patients for maintaining adherence of taking medications still   increased significantly after one month of patients discharge even if the patients suffering from emotional disturbance (p= 0.001) and being busy with other activities (p= 0.001).

Table (9) showed that lifestyle pattern of studied patients for coping with stressors and emotional situations were still significant after one month of patients discharge.

Discussion:-

  Myocardial Infarction   has a high mortality and morbidity among affected patients and reduces the quality of life. Early diagnosis and management of AMI in addition to reduction of primary risk factors has markedly decreased the AMI mortality,(Motaneb, etal. 2005). Moreover, these patients require an adequate treatment and care not only pharmacologically but also non-pharmacologically, physiotherapeutic, psychological and educational (JOLLY K, etal. 2006). Comprehensive cardiac rehabilitation program is designed to support patients with myocardial infarction in their physical, psychological and emotional recovery and to help them change lifestyle and to avoid risk factors, as well as to make them live a longer with better quality life (Barber, et al. 2001).

The current study showed that ,myocardial infarction tends to occur more frequently among men than among women and among the older people ,this may be contributed to the effects of estrogen as protective mechanism against the development of arthrosclerosis(Marchionni,2003) Also aging make the people less physical activity and more sedentary that can interpret the incidence of MI, where The present study revealed

that the majority of patients were between ages of 50 to less than 60 years old(Stampfer,2000).

The results of the present demonstrated that the majority of subjects were married; working technical jobs and their educational level was secondary level .This finding is supported with *Lewis, et al., (2004) & Monahan, et al., (2007),* whom reported that, married personal are more exposed to psychological stress and the nature of work affect the quality of life especially manual work that increase exposure to physical and psychological stress (Rozanski, Blumenthal,& Kaplan 1999). As well as, the level of education has an effect on behaviors and the beliefs of patients to accept the illness and modify their lifestyle according to prescribed therapeutic regimen (Haskell, 2003).

Determining coronary risk factors is very important for planning and implementing cardiac rehabilitation program especially for patient's education which can be useful in modifying existing risk factors and then promoting quality of life for those patient's *(*Law, Watt, & Wald 2002). the present study indicate the majority of subjects were diabetic, hypertensive, and smokers. This findings was in line with Six of the major risk factors for developing CHD involve lifestyle practices, including the decision of whether or not to smoke, the control of blood pressure and lipids, diabetes ,level of physical activity, and obesity(Wexler, &Aukerman,2006).

Regarding the nutrition ,around half of the studied patients (42%, 62%, 50%) always avoid high fat diet, decrease salt and salty food, and decrease intake of sugar and sweets after implementation of the cardiac rehabilitation program significantly compared with only (2%) of patients always practicing the same practices before the program. This could be related to life long negative eating habits that patients must modify after incidence of the disease to maintain good health. But patients need good support and advice to implement these practices perfectly through cardiac rehabilitation program. These results gone in the same line with(*Solaiman, 2007) .*Who stated that nearly two thirds of the studied patients decreased salt in diet after implementation of educational program.

Normal physical activity and regular exercise is advised for most people who have had an MI .Exercise helps improve heart muscle function following a heart attack. It also helps to maintain a healthy weight and control risk factors such as diabetes, high cholesterol, and high blood pressure(Timby,& Smith, 2007). The patients must be encouraged to exercise regularly. Regular exercise is a major way to reduce the risk of having a further myocardial infarction (Gayda, et al 2006). The present study showed that most of patient (98%) did not perform any type of exercises before implementation of the cardiac rehabilitation program significantly compared with (62%) of patients always perform regular exercises and (50%) of patients always perform walking exercises even if the patients busy with other activities or have had emotional disturbance after implementation of the program .*Carlsson , (1997).* Found that all levels of exercise reduced the risk of death or heart attack, stroke or diabetes. The optimum was a moderate level which reduced the risk by 40% .

Results of the current study clarified that after implementation of the program ,nearly half of the studied patients (50%, 58%, 42%) always measuring vital signs regularly in comparison with minority did this practice before the program implementation. This finding is supported with *Lewis, et al.,(2004 & Monahan, et al., (2007).* whom reported that patient's quality of life will be improved after health education and rehabilitation program that help patients to modify their bad habits and encourage positive and good habit and confirm usefulness of these practices. Also in this study, nearly four fifty (80%) of the studied patients not measuring body weight regularly, but after the program implementation the current study showed that nearly three fifty (62%) of the patients always measuring body weight with significant difference. This could be related to non presence of weight scale at homes and dependence of patients on discovering the increase and decrease in body weight through personal appearance. In the same line, *Ghattas,(2007).* revealed that no one of the studied patients measure body weight regularly as a self-care practice during assessment of patient's needs .

A possible concern relates to the risk of smoking, three fifty (60%)   of the studied patients determine methods of stopping smoking after implementation of the program. This finding in the same line with *Seto, et al., 2011.*[)] who stated that smoking is the single most effective way to reduce the risk of a further MI. The chemicals in cigarette smoke affect the arteries. If the patients stop smoking, risk of a further MI is roughly halved compared to the risk if continue to smoke .

In the present study, the results revealed that the majority (82%) of the studied patients regular intake of medications after implementation of the program significantly compared with two fifty (40%) of the studied patients before of the implementation. This could be related to effect of the program. These findings are supported with findings of *Ahmed, 2011).* which stated that more than half of the studied patients always take the prescribed medications in the appropriate time with the appropriate dose before Implementation of the self-care program. But after implementation of the program, most of the studied patients follow the same strategies . While these findings were inconsistent with *Solaiman, 2007).* who found no significant change in patient's compliance to medications after implementation of the program.

Psychological preparation received by the patients as they were given a description about disease, opportunity to express their feeling could help them to be more calm and relaxed and decreasing the

incidence of anxiety(Franklin,2001). Also prevention of emotional arousal for increasing self- efficacy during cardiac rehabilitation is very important because, myocardial infarction patients in ICU experience psychological problems including anxiety (Barger, & Sydeman, 2005). This view has been found to be true through the results of this study as there was high level of anxiety at the beginning of this study and reduce level of anxiety after implementation of the program. Anxiety caused by the life – threatening disease, influence the patient to undertake a change of his behaviors, which is the reason why various forms of psychological intervention are necessary in order to achieve and maintain a lifestyle change in a long term.[42] Moreover ,*Fletcher, et al.*2001). stated that nurse's intervention in the form of teaching sessions and keep the patient well informed is a significant way of reducing anxiety and which lies in line with the present study.

Results of our study revealed that lifestyle pattern of patients during daily living task and routine activities, change diet, perform exercise, stop smoking increased significant after cardiac rehabilitation and continued in increasing significantly after one month of discharge. This result in the line with *Appel, et al.2007).* who mentioned that intervention from health care providers makes good sense, to help heart patients reduce the controllable CHD risk factors through proper lifestyle choices. On the other hand ,*Randell Wexler, et al.2012.)* Reported that ,therapeutic lifestyle changes are recommended for all persons with CVD, including HTN. This found in their study, therapeutic lifestyle changes alone may reduce systolic blood pressure (SBP) by between 21 mm Hg and 55 mg Hg

Conclusion and Recommendation:

Finding of the present study revealed that, there was highly statistical significant positive change in lifestyle pattern of patients with myocardial infarction to control the physiological problems associated with the disease and medications received after implementation of the cardiac rehabilitation program.

Planning for cardiac rehabilitation should be based on an assessment of the patient's risk factors which explores the areas needed to be modified and help rehabilitator to toiler the education program for each patient.

Cardiac rehabilitation program for patients with myocardial infarction should be implemented on a wider field and evaluated for further improvement. Moreover, lifestyle pattern changes are recommended for all persons with MI to reduce the risk factors and improve quality of life.

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Table (1): Socio-demographic characteristics of the studied patients (n=50).

Characteristic		Number	%
Age	30 - 40 Yrs	14	28
	41 – 50 Yrs	8	16
	51 – 65 Yrs	28	56
	Mean ± SD	54.62 ± 10.1	
	Range	30 – 65	
Gender	Female	16	32
	Male	34	68
Marital status	Single	8	16
	Married	32	64
	Widow	10	20
Educational level	Illiterate	15	30
	Read and write	8	16
	Middle education	18	36
	University	9	18
Occupation	Yes	30	60
	No	20	40
Kind of work	Office clerks workers	9	30
	Technical workers	14	46.7
	Others	7	23.3
Daily working hours	< 6 hours	5	16.7
	6 – 8 hours	10	33.3
	> 8 hours	15	50
Causes of not working	The disease (MI)	14	70
	Causes other than the disease	6	30

Table (2): - The economic and residence characteristics and burden of treatment among the studied patients (n = 50).

Item		Number	%
Family Monthly income	Enough for living	35	70
	Not enough for living	15	30
Source of fund for treatment	State fund	9	18
	Health insurance	11	22
	Hospital	5	10
	Monthly income	33	66
Site of residence	Urban	35	70
	Rural	15	30
Living floor	0 < 2	37	74
	2 – 4	11	22
	> 4	2	4
Suitable home characteristics score	Low (8 – 11)	2	4
	Middle (12 – 14)	15	30
	High (15 - 19)	33	66

Table (3): - Medical history of the studied patients (n = 50).

Medical history		Number	%
Duration of illness	1 ≤ 5 years	42	84
	5 – 10 years	2	4
	> 10 years	6	12
Presence of co-morbid diseases	Yes	45	90
	No	5	10
Types of Co-morbid diseases	Diabetes Mellitus	30	66.7
	Hypertension	21	46.7
	Ischemic Heart Disease	13	28.9
	Smoking	35	77.8
	Other chronic illness	6	13.3
	Respiratory disorders	4	8.9

Table (4) : Relationship of lifestyle pattern related to nutrition and exercise before and after the program implementation as reported by patients (n= 50)

Lifestyle domains	Pre-						Post-						X2	P- Value
	Non		Sometimes		Always		Non		Sometimes		Always			
	No	%	No	%	No	%	No	%	No	%	No	%		
Nutrition														
Eat breakfast regularly	15	30	6	12	29	58	0	0	3	6	47	94	34.738	< 0.001
Daily balanced meals	16	32	5	10	29	58	0	0	3	6	47	94	20.763	< 0.001
Avoid high fat diet	48	96	1	2	1	2	18	36	11	22	21	42	40.152	< 0.001
Decrease salt and salty food	45	90	4	8	1	2	10	20	9	18	31	62	52.321	< 0.001
Decrease intake of sugar and sweets	49	98	0	0	1	2	8	16	17	34	25	50	68.645	< 0.001
Increase intake of foods rich with vitamin K	3	9	2	4	45	90	1	2	0	0	49	98	3.170	0.205
Take A lot of fluids	27	54	2	4	21	42	1	2	11	22	38	76	35.272	< 0.001
Decrease coffee, tea and soda	28	56	3	6	19	38	1	2	2	4	47	94	37.217	< 0.001
Maintain healthy cardiac diet when being outside the house	28	56	2	4	20	40	10	20	9	18	31	62	15.353	< 0.001
Maintain healthy cardiac diet with any emotional disturbance	45	90	3	6	2	4	5	10	20	40	25	50	64.185	< 0.001
Maintain healthy cardiac diet when too busy with other activities	26	52	6	12	18	36	2	4	19	38	29	58	29.906	< 0.001
Exercise														
Regular exercise ,15-30 min , 3 times/ week	49	98	1	2	0	0	8	16	11	22	31	62	68.825	< 0.001
Determine singe& symptoms of exercises limitation	28	56	12	24	10	20	2	4	1	2	47	94	55.859	< 0.001
Perform ROM & breathing exercises at home	45	90	4	8	1	2	2	4	10	20	38	76	77.014	< 0.001
Walk for 5 minutes at home	5	10	16	32	20	58	1	2	2	4	47	94	17.819	< 0.001
Relax daily for 10-15 min	16	32	5	10	29	58	1	2	0	0	49	98	23.363	< 0.001
Practice aerobic as doctor order	3	6	26	32	21	42	3	6	9	18	38	76	13.155	< 0.001
Maintain walking exercises when too busy with other activities	49	98	0	0	1	2	20	40	5	10	25	50	39.342	< 0.001
Maintain walking exercises with any	49	98	0	0	1	2	20	40	5	10	25	50	39.342	< 0.001
Feel happy and satisfied	35	70	6	12	9	18	9	18	2	4	39	78	36.114	< 0.001
Feel ambitious and optimistic	44	88	1	2	5	10	9	18	6	12	35	70	49.185	< 0.001
Trust and being trusted by others	26	52	6	12	18	36	5	10	12	24	33	66	20.638	< 0.001
Control self in anger	29	58	3	6	18	36	9	18	13	26	28	56	18.950	< 0.001
Prayer and meditation are part of life	10	20	15	30	25	50	2	4	8	16	40	80	10.925	0.004
Use comfortable foot wear during exercise	3	6	2	4	45	90	1	2	0	0	49	98	3.170	0.205

Table (5) : Relation of life style pattern related to health management skills and utilization of medication before and after the program implementation as reported by patients (n = 50).

Lifestyle domains	Pre-						Post-						X2	P- Value
	Non		Sometimes		Always		Non		Sometimes		Always			
	No	%	No	%	No	%	No	%	No	%	No	%		
Health derangement skills														
Regular daily pulse measurement	49	98	0	0	1	2	1	2	11	22	38	76	92.183	< 0.001
Regular daily blood pressure measurement	29	58	3	6	18	36	0	0	3	6	47	94	41.938	< 0.001
Regular daily respiration measurement	48	96	1	2	1	2	18	36	11	22	21	42	10.152	< 0.001
Daily measurement of body weight	40	80	4	8	6	12	9	18	10	20	31	62	39.076	< 0.001
Lose weigh	27	54	2	4	21	42	1	2	1	2	48	96	35.041	< 0.001
Regular measurement of bleeding & prothrombin time as physician order	3	6	2	4	45	90	1	2	0	0	49	98	3.170	0.205
Regular measurement of blood hemoglobin percentage as physician order	2	4	2	4	46	92	1	2	1	2	48	96	0.709	0.701
Regular measurement of blood lipids as physician order	2	4	2	4	46	92	1	2	1	2	48	96	0.709	0.701
Regular measurement of sodium &potassium percentage in blood as physican order	2	4	2	4	46	92	1	2	1	2	48	96	0.709	0.701
Determine methods of stopping smoking	40	80	4	8	6	12	14	28	6	12	30	60	28.919	< 0.001
Control chest pain by taking drugs	26	52	6	12	18	36	1	2	4	8	45	90	35.120	< 0.001
Medical follow up														
Determine indication & precautions of prescribed medication	20	40	9	18	11	22	3	6	5	10	42	84	31.11341	< 0.001
Take non prescribed medications	10	20	12	24	28	56	42	84	3	6	5	10	41.123	< 0.001
Take medications only when necessary	15	30	8	16	27	54	43	86	5	10	2	4	35.761	< 0.001
Regular intake of medications	27	54	3	6	20	40	3	6	6	12	41	82	27.430	< 0.001
Maintain taking medication at time when	41	82	0	0	9	18	4	8	9	18	37	74	56.430	< 0.001
Maintain taking medication at time with any emotional at time with any emotional disturbance	41	82	0	0	9	18	4	8	9	18	37	74	56.466	< 0.001
Determine when should visit doctor about heart disease	15	30	6	12	29	58	0	0	3	6	47	94	20.263	< 0.001

Table (6): relationship of lifestyle pattern related to Stressors & anxiety & Emotional and spiritual before and after the program implementation as reported by patients (n = 50).

Lifestyle domains	Pre-						Post-						X2	P-Value
	Non		Sometimes		Always		Non		Sometimes		Always			
	No	%	No	%	No	%	No	%	No	%	No	%		
Stressors and anxiety														
Feel accumulation of problems	2	4	2	4	46	92	25	50	17	34	8	16	58.175	< 0.001
Feel more nervous than other	10	20	20	40	20	40	10	20	31	62	9	18	6.545	0.038
Always worried about health	3	6	2	4	45	90	35	70	6	12	9	18	52.947	< 0.001
Have good relations with peers neighbors	14	28	14	28	22	44	3	6	10	20	37	74	11.598	0.003
Have sleep disturbance	15	30	6	12	29	58	18	36	15	30	17	34	7.260	0.027
Perceive the causes of stress	16	32	14	28	20	40	3	6	10	20	37	74	14.632	0.001
Emotional and spiritual														
Feel self satisfaction	44	88	1	2	5	10	12	24	0	0	38	76	44.611	< 0.001
Feel happy and satisfied	35	70	6	12	9	18	3	6	2	4	54	90	52.947	< 0.001
Feel ambitious and optimistic	44	88	1	2	5	10	12	24	0	0	38	76	44.611	< 0.001
Trust and being trusted by others	26	52	6	12	18	36	1	2	19	34	30	60	32.908	< 0.001
Control self in anger	26	58	3	6	18	36	1	2	10	20	39	78	37.639	< 0.001
	10	20	15	30	25	50	2	4	11	22	37	74	8.271	0.016

Table (7): Relationship of lifestyle pattern related to nutrition and exercise before the program implementation and after one month as reported by patients (n= 50)

Lifestyle domains	Pre-						Post-						X2	P- Value
	Non		Sometimes		Always		Non		Sometimes		Always			
	No	%	No	%	No	%	No	%	No	%	No	%		
Nutrition														
Eat breakfast regularly	15	30	6	12	29	58	2	4	3	6	45	90	14.401	0.001
Daily balanced meals	16	32	5	10	29	58	4	8	2	4	44	88	11.562	0.003
Avoid high fat diet	48	96	1	2	1	2	12	24	15	30	23	46	54.017	< 0.001
Decrease salt and salty food	45	90	4	8	1	2	10	20	11	22	29	58	51.673	< 0.001
Decrease intake of sugar and sweets	49	98	0	0	1	2	13	26	12	24	25	50	55.673	< 0.001
Increase intake of foods rich with vitamin K	3	9	2	4	45	90	1	2	3	6	46	92	1.211	0.546
Take A lot of fluids	27	54	2	4	21	42	1	2	11	22	38	76	35.272	< 0.001
Decrease coffee, tea and soda	28	56	3	6	19	38	4	8	2	4	44	88	28.121	< 0.001
Maintain healthy cardiac diet when being outside the house	28	56	2	4	20	40	10	20	9	18	31	62	15.353	< 0.001
Maintain healthy cardiac diet with any emotional disturbance	45	90	3	6	2	4	10	20	20	40	20	40	49.565	< 0.001
Maintain healthy cardiac diet when too busy with other activities	26	52	6	12	18	36	9	18	12	24	29	58	12.832	0.002
Exercise														
Regular exercise ,15-30 min , 3 times/ week	49	98	1	2	0	0	11	22	10	20	29	58	60.430	< 0.001
Determine singe& symptoms of exercises limitation	28	56	12	24	10	20	3	6	1	2	46	92	52.612	< 0.001
Perform ROM & breathing exercises at home	45	90	4	8	1	2	4	8	11	22	35	70	69.684	< 0.001
Walk for 5 minutes at home	5	10	16	32	20	58	1	2	2	4	47	94	17.819	< 0.001
Relax daily for 10-15 min	16	32	5	10	29	58	1	2	0	0	49	98	23.363	< 0.001
Practice aerobic as doctor order	3	6	26	32	21	42	5	10	6	12	39	78	18.400	< 0.001
Maintain walking exercises when too busy with other activities	49	98	0	0	1	2	12	24	9	18	27	54		
Maintain walking exercises with any emotional disturbance	49	98	0	0	1	2	18	36	7	14	25	50	43.497	< 0.001
Use comfortable foot wear during exercise	3	6	2	4	45	90	1	2	0	0	49	98	3.170	0.205

Table (8) : Relation of life style pattern related to health management skills and medication before the program implementation and after one month as reported by patients (n = 50).

Lifestyle domains	Pre-						Post-						X2	P- Value
	Non		Sometimes		Always		Non		Sometimes		Always			
	No	%	No	%	No	%	No	%	No	%	No	%		
Health derangement skills														
Regular daily pulse measurement	49	98	0	0	1	2	10	20	7	14	33	66	62.897	< 0.001
Regular daily blood pressure measurement	29	58	3	6	18	36	0	0	5	10	45	90	41.071	< 0.001
Regular daily respiration measurement	48	96	1	2	1	2	20	40	12	24	18	36	36.048	< 0.001
Daily measurement of body weight	40	80	4	8	6	12	9	18	10	20	31	62	39.076	0.001
Lose weigh	27	54	2	4	21	42	2	4	4	8	44	88	30.357	< 0.001
Regular measurement of bleeding & prothrombin time as physician order	3	6	2	4	45	90	1	2	3	6	46	92	1.211	0.546
Regular measurement of blood hemoglobin percentage as physician order	2	4	2	4	46	92	1	2	3	6	46	92	0.533	0.766
Regular measurement of blood lipids as physician order	2	4	2	4	46	92	1	2	3	6	46	92	0.533	0.766
Regular measurement of sodium &potassium percentage in blood as physician order	2	4	2	4	46	92	1	2	3	6	46	92	0.533	0.766
Control chest pain by taking drugs	26	52	6	12	18	36	0	0	4	8	46	92	38.650	< 0.001
Medical follow up														< 0.001
Determine indication & precautions of prescribed medication	20	40	9	18	11	22	3	6	5	10	42	84	31.113	< 0.001
Take non prescribed medications	10	20	12	24	28	56	45	90	4	8	3	6	49.577	< 0.001
Take medications only when necessary	15	30	8	16	27	54	43	86	5	10	2	4	34.761	< 0.001
Regular intake of medications	27	54	3	6	20	40	4	8	6	12	40	80	24.731	< 0.001
Maintain taking medication at time when	41	82	0	0	9	18	4	8	9	18	37	74	56.466	< 0.001
Maintain taking medication at time with any emotional at time with any emotional disturbance	41	82	0	0	9	18	4	8	9	18	37	74	56.466	< 0.001
Determine when should visit doctor about heart disease	15	30	6	12	29	58	0	0	3	6	47	94	20.236	< 0.001

Table (9): relationship of lifestyle pattern related to Stressors & anxiety & Emotional and spiritual before the program implementation and after one month post as reported by patients (n = 50).

Lifestyle domains	Pre-						Post-						X2	P- Value
	Non		Sometimes		Always		Non		Sometimes		Always			
	No	%	No	%	No	%	No	%	No	%	No	%		
Stressors and anxiety														
Feel accumulation of problems	15	30	6	12	29	58	18	36	12	24	20	40	3.926	0.140
Feel more nervous than other	16	32	14	28	20	40	4	8	9	18	37	74	13.357	0.001
Always worried about health	3	6	2	4	45	90	27	54	8	16	15	30	37.800	0.001 <
Have good relations with peers , neighbors	10	20	20	40	20	40	12	24	28	56	10	20	4.848	0.089
Have sleep disturbance	2	4	2	4	46	92	15	30	17	34	18	36	34.033	0.001 <
Perceive the causes of stress	14	28	14	28	22	44	3	6	10	20	37	74	11.598	0.003
Emotional and spiritual														

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