
Effect of Orem Self Care Theory on Clients with cardiovascular disease

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ABSTRACT

Background: According to Orem's definition, self care includes those learned behaviors that individuals perform in order to preserve or promote their daily living activity, health, well being and prevention or treatment of their disease. **The aim** of this study was to improve daily living activity for clients with Cardiovascular disease using Orem self care theory at Benha City. **Design:** A quasi-experimental design was used in carrying out this study. **Setting** the study was conducted at the Medical Outpatients' Clinics of Benha University Hospital and Health Insurance Hospital. **The sample** of this study included 100 Cardiovascular disease' clients chosen randomly from total (1000). **Tools** utilized in this study comprised a structured interviewing questionnaire for the assessment of clients' socio-demographic characteristics, knowledge about disease, self-care, and daily living activity, clients' home environment assessment and the health profile for history of Cardiovascular disease' clients; and clients' practices for measuring pulse. **Results** of this study showed a significant positive effect of self care program on knowledge, practices and self-care of Cardiovascular disease' clients. There were improvements in Cardiovascular disease clients' self-care of daily living activities after conduction of the program. **This study concluded that**, significant improvement was detected for client's daily living activities after the self care program implementation **The study recommended that**, Cardiovascular disease clients should be offered continuous refresher home health care programs, promotion and enhancement of the self-care modalities to Cardiovascular disease; written illustrated instructions about disease process, allowed foods, rest and physical activities and follow up should be available at cardiac outpatients' clinics.

Key words: Cardiovascular disease, daily living activities, self-care management, Orem theory

Introduction

Cardiovascular disease generally refers to conditions that involve narrowed or blocked blood vessels that can lead to a heart attack, chest pain (angina) or stroke. Other heart conditions, such as those that affect patient heart's muscle, valves or rhythm, also are considered forms of heart disease. Half of all deaths in the developed world and a quarter of deaths in the developing world are due to cardiovascular disease. It is predicted that by the year 2020 coronary artery disease will have become the leading cause of death in the developing world. Increase in male than female 3-1 or 3-2 (*Allender & Spradely, 2015*).

Cardiovascular Diseases (CVDs) are the number 1 cause of death globally: more people die annually from CVDs than from any other cause. An estimated 17.5 million people died from CVDs in 2012, representing 31% of all global deaths. Of these deaths, an estimated 7.4 million were due to coronary heart disease and 6.7 million were due to stroke. Over three quarters of CVD deaths take place in low- and middle-income countries. Out of the 16 million deaths under the age of 70 due to noncommunicable diseases, 82% are in low and middle income countries and 37% are caused by CVDs (*Mosbah, 2014*).

Most cardiovascular diseases can be prevented by addressing behavioral risk factors such as tobacco use, unhealthy diet and obesity, physical inactivity and harmful use of alcohol using population-wide strategies. People with cardiovascular disease or who are at high cardiovascular risk (due to the presence of one or more risk factors such as hypertension, diabetes, hyperlipidaemia or already established disease)

need early detection and management using counseling and medicines, as appropriate (*Younis. & Ahmed 2015*)

According to *World Health Organization,(2017)* cardiovascular diseases, are the number one cause of death globally, especially ischemic or coronary artery diseases (CADs) which are on top of causes list of mortality and morbidity in both sex. An estimated 17.5 million people died from cardiovascular diseases in 2005, representing 30% of all global deaths. of these deaths, 7.6 million were due to heart attacks and 5.7 million were due to stroke. Around 80% of these deaths occurred in low and middle income countries and occur almost equally in men and women. If appropriate action is not taken, by 2015, an estimated 20 million people will die from cardiovascular disease every year.

Mekhamiar, (2015) added that, heart disease the cause of a clot stroke is related to cardiovascular diseases such as atherosclerosis, heart attack, valvular heart disease of various types and all forms of acute and chronic ischemic heart disease is the leading cause of death in the industrialized Western world, accounting for one of every five deaths in 2001. In Egypt, the World Health Organization (1995) revealed that the incidence of deaths caused by cardiovascular disease is nearly 6721 per 100.000 populations per year.

Myocardial Infarction (MI) or heart attack is the irreversible necrosis of heart muscle secondary to prolonged ischemia. An infarct is an area of tissue that dies (necrosis). An MI or heart attack occurs when there is prolonged total occlusion of coronary arterial blood flow. The larger necrotic area is a coronary thrombosis; it is usually secondary to arteriosclerotic and atherosclerotic changes. Arterial spasm also may

cause an MI. Once an area of the myocardium has been damaged and destroyed, the cells in that area lose the special functions automaticity, excitability, conductivity, contractility, and rhythmicity. Thus, dysrhythmias and heart failure are common (*Al Mowla, 2012*).

Myocardial infarction symptoms vary but typically include sudden, severe chest pain, which usually is substernal and may radiate to the shoulder, arm, teeth, or throat. The pain lasts longer than anginal pain. Some clients describe it as squeezing or crushing. Rest and sublingual nitrates do not relieve MI pain. Clients may appear pale and diaphoretic, also may experience nausea and vomiting or be hypotensive and faint. Pulse is rapid and weak and may be irregular (*Zafari, 2013*).

Risk factor or factors affecting the prevalence and incidence of cardiovascular disease include basic three factors as **human biology** (such as age, sex, race, genetic inheritance and physiological function), **environment** and **life style** factors are the major contributors to development of most cardiovascular disease. Globally and within the region the sedentary life, smoking, diabetes, obesity, dyslipidaemia, high fat diet, high blood pressure, and stress are the main risks which lead to increased prevalence of cardiovascular disease especially in Egypt. The major risk factors' prevalence are as the following; smoking is nearly 48% for men and 4% for women; DM is 7.8% in urban areas, 5.6% in rural agricultural areas, and 2.5% in rural desert areas; and obesity is 55.6% and hypertension is almost 31 % (hypertension mortality rate 25% to 50%) in Egypt (*American Heart Association, 2015 a*).

According to Aaronson, et al., (2013) taking action to control risk factors can help prevent or delay heart disease. So, prevention of heart disease must rely on eating healthy, balanced diet, being more physically

active, keeping to a healthy weight, Keeping blood pressure under control, Keeping diabetes under control, giving up smoking, and taking any prescribed medication.

Activities of daily living (ADL), cognition and communication skills. A good home care helps in promoting natural recovery (to perform activities of daily living), preventing complications due to disabilities and adapting to disabilities (*Allender&spradely, 2015*).

The client with cardiovascular disease practicing selfcare to maintenance live a healthy lifestyle, perform daily living activities, adhere to the treatment regimen, and monitor symptoms. Self care management is an active, deliberate process that begins with recognizing a change in signs or symptoms and risks, evaluating the change deciding to take action, implementing treatment strategy and evaluating the treatment implemented (*WebMD,2015*).

The community health nurse has a vital role in increasing the clients' sense of control, allowing the greatest potential for independence and self-direction in daily living activities, and greater sense of involvement in their care to cope with sequel following the disease (*American Heart Association,2015, b*).

Significance of the Study

The cardiovascular disease is a leading cause of morbidity and mortality, particularly in the Western world. In Egypt, the incidence of CAD is 4.41/1000 as a result of international data base. In the UK it is estimated that 147 000 men and 121 000 women have a heart attack each year (*Mosbah, 2013*).

Nurses play a major role in engaging and encouraging clients in performing self care. In most health care settings, nurses provide the majority of client's education. It is of great importance in order to assist clients in taking control and adapting to their diagnosis of cardiovascular disease (*Washburn & Hornberger, 2008& Walker, 2011*).

Cardiac clinics, a setting that provides frequent client-nurse interaction, have proven to reduce hospitalizations. Nurses interact with clients to assess their needs, intervene appropriately, and evaluate their outcome (*Eastwood et al., 2007*).

Aim of the Study

The aim of this study is to improve daily living activity for clients with CAD using Orem self care theory at Benha City through the following objectives: Assessing self care deficits of clients with CVD according to their activity of daily living to determine the needs. 2 Designing and carrying out self care program for clients with CVD according to their needs, and Evaluating the degree of improvement in their self-care.

Hypothesis:

The self care of daily living activity will improve after the self care program implementation for clients with CVD.

SUBJECTS AND METHODS

The subjects and methods used in the present study are represented under technical, operational, administrative, and statistical designs.

I- Technical design

Research design:

A quasi-experimental design was used in carrying out this study.

Setting:

The study was conducted at the Medical Outpatients' Clinics of Benha University Hospital and Health Insurance Hospital in Benha City.

Sampling:

A purposive sample was used in this study. The total number of Cardiovascular disease clients attending in the last year at the Medical Outpatients' Clinics of Benha University Hospital was about 600, so, 10% were chosen randomly i.e. 60 Cardiovascular disease Clients, while the number of clients attending at the Medical Outpatients' clinics of Health Insurance Hospital were about 400, so, 10% were chosen randomly, i.e. 40 Cardiovascular disease clients, according to the following criteria for the Cardiovascular disease clients: Their diagnosis as Cardiovascular disease within the last three months.

Tools of data collection:

Tool I: An Interviewing Questionnaire (Appendix I)

An interview questionnaire, developed by the researcher based on literature review under supervision of supervisors, and written in simple clear Arabic language consisted of five parts as the following:

First part: It was designed to collect data about the socio-demographic characteristics of Cardiovascular disease clients. It included questions about sex, age marital status, occupation, educational level, and source of treatment fees.

Second part: It was designed to collect data about health profile of clients. It included questions about presence of chronic illness, duration of disease, complaint during attack, number of complaints / month, severity of pain, duration of pain, type of chest pain, source of information about disease, and number of hospitalizations.

Third part: It was devoted to the Cardiovascular disease client's knowledge about CVD. It included close-ended questions, which covered areas such as; heart structure, function of the heart, meaning of coronary arteries, causes of CVD, risk factors of CVD, symptoms of CVD, expansion of pain and diagnostic studies for clients with CVD, appropriate diet and medications.

Scoring system: For knowledge items the correct answers were predetermined according to literature review, a correct response was scored 1 and the incorrect one was scored zero. For each area of knowledge, the scores of the items were summed up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score, and means and standard deviations

were computed. The total knowledge was evaluated good >75%, average 50 – 75%, and poor <50%.

Fourth part: It dealt with clients' practices about self care through their daily living activity and through their risk factors; it is composed of 2 parts:

First part: It was adapted from *Susanne (2012)*, translated and modified by the researcher. It is composed of 5 lists of different daily living activity. The responses were on a 3–point: dependently, partially dependant and independently.

Scoring system: Each question has 3 levels of answer: "independently ", " with partially dependant " and " dependently ". These were respectively scored 2, 1 and 0. The scores of the items were summed–up and the total divided by the number of the items, giving a mean score. These scores were converted into a percent score, and means and standard deviations were computed. A total score was used to evaluate the effect of the program.

Second parts: It was adapted from *Gattas, (2007); El-Ahamdy (2010)*. The self-care for the CVD clients through their risk factors is composed of seven risk factors. e.g., nutrition, obesity, constipation, hypertension, diabetes mellitus, fatigue and stress.

Scoring system: Each question has 3 levels of answers: "always", "sometimes", and never. These were respectively scored 2, 1, and 0. The scores of the items were summed–up and the total divided by the number of the items, giving a mean score. These scores were converted in a percent score, and means and standard deviations were computed.

Tool II:- An observational checklist for clients practice for measuring pulse(Appendix II) .

It was developed based on literature review nursing procedure book (*Mosbah, 2013*). It is composed of five steps.

Scoring system: Each step has 3 levels of answers: "done completely", done incompletely", and not done. These were respectively scored 2, 1, and 0. The scores of the items were summed–up and the total divided by the number of the items, giving a mean score. These scores were converted in a percent score, and means and standard deviations were computed.

Content validity:

The tools validity was done by 5 of Faculties' Staff Nursing experts from the community specialties.

II- Operational Design:

Preparatory phase:

Preparation of study design and data collection tools were based on reviewing current, past, local, and international related literature about various aspects of CVD and self care by using books, journals, periodicals, and computer search to construct the tools and prepare self care program.

Ethical considerations:

Permission was obtained orally from each client before conducting the interview and after giving a brief orientation to the purpose of the study. Clients were also reassured that all information gathered would be treated confidentially and used only for the purpose of the study. No

names were required on the forms to ensure anonymity and confidentiality. They were also informed about their right to withdraw at any time from the study without giving any reasons

Pilot study:

It was conducted in December 2015 on 10% of the sample (10) of coronary artery disease clients to test clarity, simplicity, and applicability of the tools using the interviewing questionnaire and the observational checklist as a pre-test sheet. Those who shared in the pilot study were excluded from the main study sample. Based on the pilot results, the tools were modified. Modification included rephrasing and rearrangement of some questions. After refinement and modification, the final forms of the tools were developed. This pilot study was carried out in two weeks before starting the study.

Field work:

Data were collected over a period of 9 months throughout the period from beginning of January 2016 to end of December 2016. It was carried out by the researcher for the CVD clients in the selected settings at medical outpatient's clinics.

Program Development Included 3 Phases:

Phase (I):- Program preparation:

Based on the results obtained from the interviewing and observational sheets, as well as literature review, the self care program was developed by the researcher. It was implemented immediately after the pre-test. **(Appendix III).**

General objective of the program: At the end of the program the CVD clients will be able to improve daily living activities according to their needs without complications

Contents of program: The content of the program was designed to meet CVD client's needs and to fit their interest and levels of understanding.

I- Self care: Meaning and its purpose.

II-Disease: Anatomy of the heart, function of the heart, risk factors, causes, signs and symptoms, diagnostic measures, drugs used to treat CVD, side effects of these drugs, demonstration and re-demonstration to practice pulse rate, preparing healthy meals, self-care management, complications, follow up needed for clients with CVD and preventive measures to prevent recurrent attack.

Teaching Methods:

All clients received the same program content using the same teaching methods, these were:

- Lectures/Discussions.
- Demonstration.
- Role play.
- Presentation.

Teaching aids:

Suitable teaching aids were specially prepared for the program, as follows: Flip charts, pictures, available real materials (e.g., some types of food, drug specimens) and handouts.

Phase (II): Implementation of the program:

The researcher visited the medical outpatients' clinics of Benha University Hospital three times a week (Saturdays, Mondays and Tuesdays) for five months from 9.00 a.m. to 12.00 mid day. Pre test was done in the first month, followed by application of the program to the previously selected cases.

As well, the researcher visited the medical outpatient clinics of Health Insurance Hospital three times a week (Saturday, Monday and Tuesdays) for seven months from 9.00 a.m. to 12.00 mid day. The first two months to collect all cases, followed by the implementation of the program to the previously selected cases.

The total number of sessions was 8 of 15 hours (12 hours for theory and 3 hours for practice). This is in addition to 2 sessions for pre- and post tests. The duration of each session was varied, including periods of discussion pre test and post test.

The MI clients of the study group were present, all the time of the program sessions. The duration of each session varied, according to its contents as well as the clients' response.

At the beginning of the first session, an orientation to the program and its process were presented. Each session started by a summary about what had been given through the previous session then the objectives of the new topics, taking into consideration the use of simple language to suite the level of clients. Discussion, motivation and reinforcement during program sessions were used to enhance learning. Direct reinforcement in the form of a copy of the program was given as a gift for each client to use it as future reference. All the participants were cooperative with the researcher. At the end of each session, clients participated in a discussion

to correct any misunderstanding. Clients were informed about the time of the next session.

Phase (III): Evaluation of the program:

Evaluation of the program was done by using the post test questionnaire which was the same format of pre-test in order to compare the change in clients' knowledge, practices. Self care was also assessed, for the clients, immediately after implementation of the program.

III - Administrative Design:

Permission for conduction of the study and implementation of the program was obtained by submission of official letters issued from the Faculty of Nursing, Benha University to the heads of the Medical Outpatients Clinics in Banha University Hospital and Health Insurance Hospital, Benha City.

IV - Statistical Analysis:

Statistical presentation and analysis of the present study data were carried out, using the mean, standard deviation and error, student t- test, paired t-test, Chi-square, Linear Correlation Coefficient and Analysis of variance (ANOVA) test by using the statistical package for social sciences (SPSS) version 20.

Results

Table (1) shows the socio-demographic characteristics of the studied sample. It was clear that 61.0% of studied sample were females, 58.0% of them aged 40-< 50, with a mean age of 50.40 ± 5.74 years, and 78.0% were married. Regarding to educational levels, 36.0% of studied sample had secondary school education. This table also shows that,

30.0% of studied sample, were employees, 44.0% of them had insufficient monthly income, and 68.0% of them had private source for treatment fees.

Table (2) indicates that, all clients had history of hypertension and diabetes; 99.0% complained from chest pain during heart attack, while 14.0% complained from arrhythmias. As regards the number of attack per month, 75.0% of studied sample had one heart attack per month. Meanwhile, 88.0% suffered from chest pain after exertion. According to severity of chest pain, 49.0% mentioned that pain was severe and not tolerable, 63.0% of them reported that chest pain lasts < 10 min, and 69.0% of studied sample suffered from pressing as common type of chest pain. This table also shows that, all the studied sample acquired their knowledge about CVD disease from doctors, and 55.0% of the clients admitted to hospital once.

Table (3) shows the difference in client's knowledge about CVD pre and post self care program implementation. As regards the clients' knowledge about function of the heart, 64.0% of them had poor knowledge pre-program, but at post-program, all of them had good knowledge. However, in the pre-program, 47.0% of the clients had good knowledge about the meaning of Cardiovascular disease, but after the implementation of the self care program, this percentage increased and reached 97.0%. Moreover, pre program 62.0% of the clients had poor knowledge about appropriate diet for cardiac clients, but after the implementation of the program, the results showed that, 75.0% of the clients had good knowledge. In addition, the same table shows that there were highly statistically significant differences in most items related to knowledge of the CVD clients which improved after the implementation of the self care program.

Table (4) indicates the difference in clients' daily living activities pre and post self care program implementation. As regards the clients' activity about bathing, 57.0% of them could wash and dry their hair without assistance at pre-program, which improved to reach 88% at post-program; 53.0% of them could dress upper body alone at pre-program, while at post-program, this percentage reached 91.0%. As for feeding and food preparation, 72.0% of them used knife to cut food independently at pre-program, while they reached 94.0% at post-program. 56.0% of them could get on and off toilet independently at pre-program, while at post-program, they were 86.0%. Regarding mobility, 42.0% of them walking around out side independently at pre-program, while at post-program, they were 92.0%. In addition, the same table shows that there were highly statistically significant differences in most items related to clients' daily living activities due to improvements after implementation of the self care program.

Table (5) clarifies that, 78.0% of the studied sample was always eating small amounts of salty and spicy foods at pre-program, while at post-program, it was 96.0%. Concerning eating small, frequent meals during the day at pre-program, they accounted for 17.0%, however; after self care program implementation they amounted for 92.0%. There were also highly statistically significant differences in all items of the nutrition habits pre- post self care intervention program.

Table (6) indicates that, 56.0% of the studied sample rarely were adding margarine to food at pre-self care program implementation, while, after program, they represented about 92.0%. Concerning avoid eating between meal at pre-program they were 33.0%, while at post-program they represented 981.0%. Moreover, there were highly statistically significant differences in all items of obesity control pre- post self care intervention program.

Table (7) shows that, 58.0% of the studied samples were always increasing food rich in fiber at pre-program, while, after program implementation, at post-test they represented 93.0%. As regards taking prescribed medication, 25.0%, of the studied sample were always taking prescribed medication while; post-program it was 45.0%. Moreover, there were highly statistically significant differences in all items of constipation management pre- post self care intervention program.

Table (8) shows that, 50.0% of the studied sample were always exercise regularly at pre-test, while after self care program implementation, at post-test they represented 97.0%. 14.0% of the studied sample was always joining in manual work at pre-program, while post-program, they represented 82.0%. Moreover, there were highly statistically significant differences in all items of the smoking cessation which revealed improvements after implementation of the self care intervention program.

Table (9) shows that, 62.0% of the studied sample were always eating low salt food at pre-test, while, after self care program implementation, they represented 98.0%. Concerning reducing weight at pre-program they were 27.0%, while at post-program they were 86.0%. Moreover, there were highly statistically significant differences in all items of the hypertension control due to improvements after implementation of the self care intervevtion program.

Table (10) indicates that, 48.0% of the studied sample were always practicing exercise regularly as walking at pre-test, while, after self care program implementation, at post-test they represented 95.0%. Concerning reducing weight at pre-program, they were 33.0%, while at post-program they represented 98.0%. Moreover, there were highly statistically significant differences in all items of diabetes mellitus control due to improvements after implementation of the self care program.

Table (11) reveals that, 11% of the studied sample were always doing breathing exercises during work at pre-program, while, post-program, they were 79.0%. Concerning using suitable equipment while cleaning the house at pre-test they accounted for only 56.0%; however, after program implementation they amounted for most of them 97.0%. As well, there were highly statistically significant differences in all items of fatigue management due to improvements after implementation of self care program.

Table (12) indicates that 75.0% of the studied sample were always praying and listening to the Koran at pre-test, while, after program implementation, at post-test, they represented 92.0%. Concerning listening to calm music at pre-program they were 16.0%, while at post-program, they reached 81.0%. Moreover, there were highly statistically significant differences in all items of stress which shows improvements after implementation of the self care program.

Table (13) shows that, at pre – test 79% of studied sample did not support arm and rest during measuring pulse, while after program implementation 98% of them did it completely. As regards counting pulse, 99% of clients didn't count pulse for 60 seconds at pre- program, but after program implementation, 66% were doing it completely. Also the table indicates that there were highly statistically significant differences in all practice items towards measuring pulse rate which indicates improvements after implementation of the self care program.

Table (14) shows that, at pre-program the mean score of total knowledge was 23.330 ± 7.633 , while after implementation of self care program it reached 44.080 ± 3.334 . Regarding self care, at pre-program the mean score of total self care was 62.500 ± 7.436 , while after

implementation of self care program it reached 94.830 ± 3.569 . There were highly statistically significant differences in the total knowledge, total self care practices, total daily living activity and practices which reveals improvements after implementation of the self care program.

Table (15) shows that there were highly statistically significant relation between clients total mean knowledge and their age, their educational level, occupation and income, however the same table shows insignificant relation between clients total mean knowledge and sex.

Table (16) reveals that there were statistically significant relations between clients' total daily living activity scores and their educational level, however, the same table shows statistically insignificant relation between clients' total mean of daily living activity and age, occupation, sex and income.

Table (17) shows that there was statistically significant relation between clients' total self care and their age, while it was highly significant for their educational level. However, the same table shows insignificant relations between clients' total self care and occupation, sex and income.

DISCUSSION

Cardiovascular Disease (CVD) is a class of diseases that involve the heart or blood vessels. Cardiovascular disease includes coronary artery diseases such as angina and myocardial infarction. Other CVD are stroke, heart disease, carditis, aortic aneurysms, peripheral artery disease, and venous thrombosis (*Mendis, et al., 2011*).

Regarding socio-demographic characteristics of the cardiovascular patients, the present study results showed that, slightly less than two third of clients were females (table 1). This finding is consistent with *Atia(2010)* who reported that less than three fifth of cardiovascular disease were females.. Also, this finding was in agreement with *Wong (2014)*, who found that the ratio of cardiovascular events was higher in women than in men. However, this finding was not in accordance with *El Kholy (2013)*, who found that men more generally at greater risk of heart disease.

Considering age, the present study findings showed that about half of the cardiovascular patients were in the age groups ranging from 40 years to less than 50 years (table 1). This finding was in agreement with *Mohammed (2013)*, which found that the chronic heart disease is more common in persons 40 to 50 years of age. As well, the findings were supported by *The National Academy on an Aging Society (2013)*, which in a very recent study mentioned that about half of population with cardiovascular disease was in age group ranging from 40 to less than 64 years. Also, the findings were supported by *The American Heart Society (2006); Cardiology Channel (2012)*, which found that the chronic heart disease, is more common in persons 40 to 50 years of age. The current study pointed out that the mean age of the sample was 50.40 ± 5.74 years. (Table 1), so that the estrogen levels fall and females became vulnerable to cardiovascular diseases after menopause. This finding was consistent with *Gattas (2007)*, who found in his study that mean age of patients with chronic heart disease is 49.78 ± 3.65 years. *In addition Mehta, (2014)* emphasized that, women appear to be at increased risk for CAD, re-infarction, and death are more than men because the risk of women

increases significantly at menopause, as the CAD rates in women after menopause are two to three times more than women before menopause.

Regarding marital status, the present study illustrated that, Three quarters of the cardiovascular patients in this study were married, this may be due to the married people were more liable to CAD more than single related to social and psychological stress in their life and their families responsibility. While had different levels of education with dominance of secondary school education with sufficient income in more than half of the sample. This may be due to the association between increased income and educational opportunities. This finding goes in the same line with *ELsayed, &Apell, (2008)*, who found that married patients who have CAD represent the higher percentage of their study subject than single and widowed patients. Similarly, these findings were in the same line with *Al Hourani (2009)*, who reported that the majority of study patients were married, with variety levels of education.

Considering clients' health profile, the present study results showed that, all MI clients had hypertension and diabetes and slightly more than one fifth of clients had arthritis (Table 2). this finding was consistent with *Masoudi and Krumholz (2003); Mohamed (2008)*, who found that the majority of total sample had history of cardiovascular diseases such as hypertension, followed by non cardiac diseases such as diabetes. Also, these findings were supported by those of *El Kholy (2013)*, who found that medical diseases reported by the subjects included hypertension and diabetes. Furthermore, findings of this study are consistent with those of *Ibrahim et al., (2009)*, who found that Egypt has one of the highest prevalence rates of hypertension and about 36% of old age persons complain from hypertension and only one third of them receive medication.

Regards, complaints during heart attack, the present study revealed that the most of clients complain from chest pain, followed by shortness of breath. This finding was in the same line with that of *El Tohamy (2003)*, who reported that burning chest pain and dyspnea significantly affected the health and physical functioning of elderly patients with CAD. In addition, this finding was also in agreement with *Karen and El man (2003)*; *Mohamed (2008)*, who found that the main complaints experienced by elderly patients were chest pain followed by shortness of breath.

Concerning the number of heart attack per month, the present study result revealed that slightly more than three quarters of clients had one attack per month. This finding was contradicting with *Louka (2000) & coronary artery disease, (2017)* who reported that clients had frequent attacks per month.

Regarding type of chest pain and when pain occurs, the present study finding revealed that less than three quarters of clients had pressing chest pain and for the majority of them after exertion. This finding was in accordance with *The National Heart, Lung, Blood Institute (2012)*, which reported that the chest pain can be felt like uncomfortable pressure and goes away with rest.

In relation to the source of information about disease, all clients under study reported that doctors are the major source of information about disease. This may be due to the fact that when those clients were diagnosed by the doctors, the nurse was not available to them. So, the doctors take this responsibility. This result was in the same line with *Louka (2000)*, who reported that the majority of elders preferred to take advices and instructions, from doctors.

As regards number of hospitalizations, the present study result revealed that more than half had one history of hospital admission. This finding reflects the nature of the Egyptian population, especially the rural inhabitants, who stay reluctant to be hospitalized unless their condition is so late or turns critical as noted by *Aaronson, et al., (2013)* . In similar studies as those of *Heo et al., (2007) and Witham et al., (2007)*, who indicated that heart failure elders with poorer self rated quality of life were significantly more likely to be hospitalized.

Concerning MI clients' knowledge about meaning of coronary arteries, diagnostic studies for clients with MI, and appropriate diet for clients before implementation of self care program, either none or a minority of them had good knowledge, while the majority of them had poor knowledge for almost previous items. However, after the program implementation results revealed that almost three fifths of study sample had good knowledge about the previous items (Table 3). These findings were supported by *Atia (2010)*, who reported that elderly basic knowledge about cardiovascular disease such as; concept of CVD, causes, signs and symptoms, and complications were inadequate.

As regards MI clients' knowledge about symptoms of MI, there was highly significant improvement of the studied sample knowledge around this point after implementation of the self care program. The previous results are consistent This finding was in accordance with *Cytryn et al., (2009)*, who reported that patients' had inadequate knowledge, about symptoms of acute myocardial infraction.

In relation to MI clients' knowledge about risk factors of MI, the present study result showed that there was highly significant improvement of the studied sample knowledge around this point after implementation of the self care program. This finding contradicted with

Khan et al., (2006), who reported that less than half of studied subjects had good level of knowledge about risk factors. Moreover, *Younis & Ahmed (2015)* stated that the initial instruction and reinforcement by the nurse may be effective, especially because of the increase in knowledge of the disease, fostering excellent conditions for a change to a healthier lifestyle.

Regarding MI clients' knowledge about medication, the present study result showed that the most of the sample knew the medication doses and took their medication regularly even before the program. This may be due to the fact that medical illness of compliant patients increases their recognition about importance of following their therapeutic regimen to avoid cardiovascular complication and recurrent hospital admission. This could be attributed to their believes about the importance of drug which it is the main treatment of any disease and fear of complications. This finding was supported by *Al Hourani (2009)*, who found that the patients had more knowledge about their medication doses. According to *Lynda (2014)*, adherence to medication is a critical issue in chronic disease management, especially ischemic heart disease. However, the pervious findings contradicted with *Mohamed (2008)*, who reported that the majority of the studied patients were not adhering to their prescribed medications.

Considering whether the current study sample was practicing any type of exercises, the finding revealed that all clients did not know any type of exercises. This might be due to two third of clients are female don't give much interest even toward walking as a useful exercise since they consider that the usual daily efforts at home would sufficiently replace walking outside and the majority of cardiovascular elderly don't know the benefits of exercise for their condition as a cardiovascular

patient and the most of patients thought that exercise may be harmful. Similarly, *Ahmad (2008)* reported that most of patients did not perform any type of exercise and they did not know the importance of performing walking exercise for coronary patients.

In relation to daily living activities of clients, the present study revealed that about half of clients were independent in all activities of daily living (bathing, dressing, feeding, toileting, and transferring). As well, there were highly statistically significant improvements in all items related to clients' daily living activities after implementation of self care program (table 4). So, health education by the nurse about daily living activities is very important to maintain health and improve quality of life as identified by *Mekhamier (2015)*. These findings were contradicted with *Mohamed (2008)*, who reported that cardiovascular disease influences elders' functional abilities, quality of life, limiting activity and mobility and so affects elders managing of daily needs. In addition, *Skumlien et al., (2005)* found that the majority of patients were dependant on their caregivers for bathing and self care.

The present study result contradicting with *El Tohamy (2003)*, who found that the presence of MI negatively affect the health and physical functioning dimensions of quality of life, where most of elderly MI patients had limitation of indoor and outdoor activities. A study conducted in the United Kingdom by *Ellery et al., (2006)*, reported that 43% of patients with heart failure have limitation in their activities of daily living and instrumental activities of daily living.

Considering the effect of self-care program, the statistical analysis of the current study results showed that, there were highly statistically significant improvements of MI clients in all self-care items (nutrition, obesity, constipation, hypertension, diabetes, fatigue, stress and

depression,) after implementations of self care program. This might be due to that less than half of studied sample had secondary school and university levels of education. So, the high educated clients had high level of self care as they like to know what could benefit them and what may cause harm to them.

Regarding self-care related to proper nutrition that clients under study follow, the result revealed that, less than half of the study sample were always avoiding drinking fluids containing caffeine i.e., coffee tea and nescafe, while, three quarters of them were eating small amounts of salty foods and spicy foods, eating small amount of fatty foods as meat, oil, butter, and cream, and slightly less than three quarters of them were eating fresh vegetables and fruits (table 5). These results were congruent with *Louka (2000)*, who found that one third of MI clients drink one or two cups of tea per day and the majority of elders didn't drink coffee. Similarly, *Al- Hourani (2009)* reported that the majority of patients were concerned to know how diet could affect their myocardial infarctions.

These findings contradicted with *Ahmad (2008) & Khalel (2011)*, who reported that more than two thirds of patients were non adherent with therapeutic diet and most of them ate saturated either from meat or margarine, little amounts of fruits and vegetables considering that healthy food should contain more fat and meat.

Considering self-care related to avoiding obesity in the current study, results revealed that, less than one quarter of clients adding margarine or butter to food, followed by eating between meals (table 6). These findings were consistent with *Hiadar (2002)*, the majority of patients reported that they used margarine and still ate high fatty food. They also added that there is good scientific evidence that nutrition has a

profound effect on the development of heart disease appropriate nutrients intake can change both incidence and severity of MI.

Regarding self care related to constipation management, the present study result indicated that there was highly statistically significant improvement in all items of constipation after implementation of self-care program (table 7). This might be constipation requires multi factorial interventions including nutritional education counseling especially sufficient dietary fiber intake that does not only prevent constipation but also decrease number and severity of anginal attack because high fiber diet lower serum cholesterol and triglyceride levels. Behavioral modification and exercise training. This finding was consistent with *Louka (2000)*, who reported that there was high difference between old age behavior in case of constipation before and after the program.

As regards self care related to smoking cessation, the present study findings indicated that there was highly statistically significant improvement in all items related to smoking (table 8). This might be due to health education of cardiovascular elderly addresses health practices such as physical activity, avoidance of smoking and environmental tobacco smoke. According to *Dalal et al., (2010)*, who stated that smoking is considered a major risk factor in the present study sample, which should be targeted in any health education intervention as a proved modifiable risk factor in ischemic heart disease. Similarly, *Christina et al., (2012)* added that heavy smokers when compared with never smokers were significantly more likely to report some/ sever problems in all five domains, mobility, self care, usual activity, pain/ discomfort and anxiety/depression.

In this respect *Hiadar (2002)* emphasized that the majority of patients stopped the smoking habit after they had the disease. In addition, the UK guideline for primary care team recommended that primary care should assess the smoking status of patients at every opportunity, advise all smokers to stop, refer to a specialist cessation service if necessary and recommend smokers who want to stop to use nicotine replacement therapy (NRT).

With reference to self care related to hypertension control, the result of present study revealed that there were highly statistically significant improvements in all items of hypertension after implementation of self care program (table 9). These findings were in congruence with *Khalel (2011)* who found that blood pressure levels had a decreasing trend in the study group and an increasing trend in the control group.

Regarding self care related to diabetes mellitus control, the present study result revealed that slightly less than half of clients were making exercise regularly and slightly more than one third of clients reduced their weight before implementation of the self care program (table 10). These findings were consistent with *Mohamed (2008)*, stated that three fifths of patients were not performing any type of exercise.

Considering self-care related to fatigue management, more than half of the studied clients were using suitable equipment while cleaning the house, asking for help from others if needed and half of them were arranging their works before implementation of the self care program (table 11). The results of this study were congruent with *Lemone (2008)*, who found that, the majority of clients were arranging their works using suitable tools to minimize fatigue.

As a self-care related to stress control and depression, the result of present study showed that slightly less than three quarters of clients were praying and listening to the Koran followed by talking with other client who passed the same stage of stress and managed to overcome it before implementation of the self care program (table 12). This might be due to their belief that the disease is fatal; gaining religious support, and being near from God might help them to accept this, and gain a sense of power in controlling the situation.

This finding was consistent with *Ahmad (2008)*, who concluded that the best methods of stress control were praying, isolation and talking with others which go with the Egyptian culture. These results are also supported by what was mentioned by *Miller (2007)*, in that clients use the religion strategies' support for managing the emotional impact of illness and cope with their chronic illness.

In relation to clients' practice for measuring pulse, the present study indicated that there were highly statistically significant improvements in all practice items toward measuring pulse rate after implementation of self care program (Table 13). This might be due to that clients weren't exposed to these practices from any of the doctors, nurses, media or during their study. This finding was in congruence with *Louka (2000)*, who found that all clients didn't know correct answers about steps for measuring pulse before the program; meanwhile after the program implementation this result was changed.

According to the results of this study, there were highly statistically significant improvements in the total knowledge, self care practices, and daily living activity of MI clients and practice for measuring pulse after implementation of the self care program (Table 14). This might be due to

that the MI clients who received the self care program reported improvement in knowledge, self care practice, daily living activities and practice for measuring pulse.

In the current study there were highly statistically significant relations between clients' total knowledge and their age, their educational level, occupation, and income, while it was an insignificant relation between total knowledge and clients' sex (Table 16). These findings contradicted with those of *Al Hourani (2009)*, who reported that there were no statistically significant relations between socio-demographic and total knowledge and needs of the study patients.

As regards the relation between clients' total knowledge about MI and sex, this study finding was supported by *Potvin et al (2000)*, who found that there was no statistically significant relation between patients' sex and patients' knowledge about risk factors of acute myocardial infraction. However, this finding contradicted with *Kayaniyil et al (2009)*, who reported that the females had lower knowledge than males. Additionally, *Al Hallak (2010)* reported that there was a statistically significant difference between sex and patients' knowledge.

Considering age, this study finding was supported by *Potvin et al., (2000)*, who reported that there was an association between age and knowing each of risk factors of MI. In this respect, *Goff et al., (1998)* found that the youngest group showed generally less knowledge than the older groups, while this result contradicted with *Al Hallak (2010)*, who detected no statistically significant difference between patients' age and patients' knowledge.

In relation to the educational level, the highly educated clients had high level of knowledge, this might be explained by the fact that educated

person like to know what things benefit them and what may cause harm. According to *Al Hallak (2010)*, there was a statistically significant difference between the level of education and patients' knowledge. Similarly, *Kayaniyil et al., (2009)* reported that patients with less than high school education had lower knowledge score about risk factors of heart disease.

Considering income, this study finding was supported by *El-Ahamdy (2010)*, who identified that a lack or loss of income reduces a person's or family members control over circumstances of their lives and limits their choices, in relation to insufficient diet, inadequate housing, and inability to afford recommended treatments.

In the current study, the results revealed that, there was a statistically significant relation between clients' total daily living activity and their educational level, but results showed statistically insignificant relation between clients' total daily living activity and age, sex occupation and income (Table 17). It may be because early limitation in activities of daily living are not essential risk factors but early indicators of functional decline. Similarly, several primarily recent studies attempted to predict subsequent disability with some measurements of early disability.

This finding was supported by *Coyle (2000)* who reported that "self-care power and activity are learned behaviors that a person is supposed to learn them from early childhood to adulthood and formal education as a basic influential factor having a direct relationship with the levels of self care ability.

In this study, results showed that, there were highly statistically significant relation between clients' total self care and their age, and their educational level, but it shows insignificant relations between clients'

total self care and occupation, income and sex (Table 18). This finding contradicted with *Hassani et al., (2010)* who reported that there are no relationships between some baseline factors (the variables of sex, employment status and income level) and self-care ability of coronary artery disease patients according to Orem theory.

Coyle, (2000) mentioned that "sex as a basic conditional factor can affect the self-care ability and needs. In addition, sex is related to dependent care and dependent care ability, according to various roles defined by culture. Finding of the present study was supported by *Akyol et al., (2007)* who reported that hypertensive men had higher self-care ability, but did not report any statistically significant difference with regard to the self care ability of both sexes.

Regarding to age, finding of the present study contradicted with *Akyol et al., (2007)*, who reported that there is no statistically significant correlation between age and self-care ability of hypertensive patients. But *Orem et al., (2009)* theory reported that the strengths and self-care needs are different according to the developmental level determined by age. The finding of the present study was similar to the results of *Baghaiy (2005)* study in Iran which indicated a significant relationship between educational level and self-care ability.

Conclusion:

In the light of the study findings, and research hypothesis, it might be concluded that:

There was improvement in the cardiovascular disease clients' knowledge about cardiovascular disease as; function of the heart, meaning, risk factors, medication, and exercise. As well, there was a

better practice related to measuring pulse in relation to position the client's arm supported and rest, taking firm hold of the client's wrist, placing first three fingers on wrist bone just over radial artery, with sufficient pressure to feel the pulsation distinctly. As well, there was a better in all items of self-care practice related to Cardiovascular disease after implementation of self care program.

Significant improvement was detected for cardiovascular disease client's daily living activities after the self care program implementation. There was a highly statistically significant relationship between clients' total knowledge, daily living activities and self-care management and their educational level.

RECOMMENDATIONS

Based on the findings and conclusion of the current study, the following recommendations are suggested:

- Establish self care program to improve self care for Cardiovascular disease clients; a strict written illustrated instructions in all cardiovascular outpatients' clinics should be available about: The disease process, daily living activities, self care management, and follow up and managing health problems as fatigue, stress, obesity, improper nutrition and smoking
 - Further research is proposed to explore the effect of self care intervention on the prevention of cardiovascular disease among high risk group.
-

Table (1): Distribution of Cardiovascular disease (CVD) clients according to their socio-demographic characteristics (n = 100).

Items	%
Sex :	
Male	39.00
Female	61.00
Age	
30-	8.00
40-	58.00
50 +	34.00
Mean + SD	50.40 ± 5.74
Marital status	
Married	78.00
Widowed	17.00
Divorced	3.00
Educational level	
Illiterate	32.00
Read and write	18.00
Basic education	6.00
Secondary education	36.00
University education	8.00
Occupation	
Employed	30.00
Housewife	26.00
Private worker	11.00
Retirement	14.00
Unemployed	19.00
Income	
Sufficient and saving	0.00
Sufficient	56.00
Insufficient	44.00
Source of treatment fees	
Working place	3.00
Health insurance	29.00
Private	68.00

Table (2): Distribution of CVD clients according to health profile (n=100).

Items	%
Chronic illness	
Hypertension	100.00
Diabetes	100.00
Arthritis	11.00
Anemia	10.00
Liver disease	7.00
•Complains during heart attack	
Chest pain	99.00
Shortness of breathing	95.00
Arrhythmias	14.00
Number of heart attack / month	
Once	75.00
Twice	20.00
thrice and more	5.00
•Precipitating factors of chest pain	
After exertion	88.00
After eating	50.00
After anxiety	17.00
During rest	19.00
Pain tolerance	
Sever and not tolerable	49.00
Sever but can be tolerable	47.00
Tolerable	4.00
Duration of chest pain	
< 10 min	63.00
≤ 10 min	37.00
Type of chest pain	
Stitching	21.00
Pressing	69.00
Heaviness	10.00
•Source of information about disease	
Doctor	100.00
Nurse	7.00
Pharmacists	15.00
Family	10.00
Number of hospitalizations	
None	40.00
Once	55.00
Twice or more	5.00

• Answers are mutually exclusive

Table (3): Distribution of CVD clients' knowledge pre and post program (n = 100).

Knowledge	Pre- program (%)			Post- program (%)			X ²	P-value
	Good	Average	Poor	Good	Average	Poor		
Cardiovascular Diseases								
Heart structure	0.00	36.00	64.00	62.00	35.00	3.00	173.407	<0.000**
Function of the heart	35.00	1.00	64.00	100.00	0.00	0.00	117.426	<0.000**
Meaning of cardiovascular disease CVD	47.00	2.00	51.00	97.00	1.00	2.00	79.433	<0.000**
Causes of CVD	2.00	52.00	46.00	75.00	25.00	0.00	161.636	<0.000**
Risk factors of CVD	1.00	65.00	34.00	92.00	7.00	1.00	211.196	<0.000**
Symptoms of CVD	1.00	61.00	38.00	61.00	39.00	0.00	98.778	<0.000**
Radiation of Pain	3.00	96.00	1.00	97.00	3.00	0.00	223.423	<0.000**
Diagnostic studies for clients with CVD	0.00	13.00	87.00	60.00	37.00	3.00	193.647	<0.000**
Appropriate diet for client	2.00	36.00	62.00	75.00	25.00	0.00	173.927	<0.000**
Medication doses	94.00	0.00	6.00	100.00	0.00	0.00	8.503	<0.004*
Medication benefits	47.00	0.00	53.00	98.00	0.00	2.00	77.390	<0.000**
Taking medication regularly	92.00	3.00	5.00	97.00	2.00	1.00	8.503	<0.004*
Exercising regularly	95.00	0.00	5.00	98.00	1.00	1.00	7.060	<0.008**
Type of exercise	0.00	0.00	100.00	1.00	60.00	39.00	112.267	<0.001**
Prevention of CVD	100	40.00	59.00	40.00	58.00	2.00	142.949	<0.000**

Table (4): Distribution of CVD clients daily living activities pre and post program (n = 100).

Daily Living Activity	Pre program (%)			Post program (%)			X ²	P-value
	Independent	Partly dependant	Dependant	Independent	Partly dependant	Dependant		
Bathing								
washing the back	52.00	48.00	2.00	88.00	11.00	1.00	38.21	<0.000**
washing and drying the hair	57.00	40.00	3.00	88.00	12.00	0.00	27.09	<0.000**
washing and drying whole body	47.00	50.00	3.00	86.00	12.00	2.00	34.93	<0.000**
Dressing								
Dressing upper body	53.00	44.00	3.00	91.00	9.00	0.00	31.14	<0.000**
Putting shoes/socks on	49.00	48.00	3.00	90.00	10.00	0.00	40.61	<0.000**
Feeding & food preparation								
In the kitchen:								
Lift something off a shelf which above clients' shoulders height.	42.00	44.00	14.00	75.00	24.00	1.00	30.54	<0.000**
Using a knife to cut food	72.00	22.00	8.00	94.00	4.00	0.00	21.17	<0.000**
Making a self hot snack	37.00	60.00	3.00	92.00	8.00	0.00	66.21	<0.000**
Toileting								
Getting on and off the toilet	56.00	42.00	2.00	86.00	14.00	0.00	21.68	<0.000**
Transfer (Mobility)								
Walking around outside	42.00	46.00	12.00	92.00	8.00	0.00	56.01	<0.000**
Climbing stairs	11.00	67.00	22.00	40.00	59.00	1.00	33.85	<0.000**
Traveling on public transportation	28.00	52.00	20.00	45.00	54.00	1.00	21.30	<0.000**
Bending over from standing	50.00	41.00	9.00	87.00	12.00	1.00	32.74	<0.000**

Table (5): Distribution of CVD clients self-care regarding proper nutritional habits pre and post program (n = 100).

Items	Pre program (%)			Post program (%)			X ²	P-value
	Always	Sometimes	Never	Always	Sometimes	Never		
Drinking:								
1- Fluids as water & juices	41.00	57.00	2.00	90.00	10.00	0.00	55.03	<0.000**
2- Prevent fluids containing caffeine (such as coffee, tea & nescafe)	45.00	54.00	1.00	95.00	5.00	0.00	59.55	<0.000**
Eating :								
1- Food containing vitamin "C" (as limon, orange & guava).	57.00	43.00	0.00	92.00	8.00	0.00	32.24	<0.000**
2- Fresh vegetables and fruits	73.00	24.00	3.00	99.00	1.00	0.00	28.09	<0.000**
3- Small amount of fatty foods (as meat, oil, ghee, butter & cream)	75.00	19.00	6.00	99.00	1.00	0.00	29.89	<0.000**
4- Small amounts of salty and spicy foods	78.00	26.00	6.00	96.00	3.00	1.00	16.35	<0.000**
5- Small, frequent meals during the day	17.00	22.00	59.00	92.00	7.00	1.00	126.46	<0.000**
6- Committed to a healthy food system	11.00	45.00	44.00	87.00	11.00	2.00	126.01	<0.000**
7- Rarely junk food	29.00	61.00	10.00	97.00	2.00	1.00	100.38	<0.000**

Table (6): Distribution of CVD clients' self-care regarding obesity control pre and post program (n = 100).

Items	Pre program (%)			Post program (%)			X ²	P-value
	Always	Sometimes	Never	Always	Sometimes	Never		
Drinking a lot of water	49.00	50.00	1.00	81.00	16.00	3.00	26.00	<0.000**
Adding margarine or butter to food rarely	56.00	21.00	23.00	92.00	7.00	1.00	33.74	<0.000**
Eating more vegetables	51.00	45.00	4.00	94.00	6.00	0.00	64.58	<0.000**
Exercise regularly	45.00	41.00	14.00	90.00	7.00	3.00	46.20	<0.000**
Avoid eating between meals.	33.00	53.00	14.00	91.00	7.00	2.00	66.56	<0.000**

Table (7): Distribution of CVD clients' self-care regarding constipation management pre and post program (n = 100).

Items	Pre program (%)			Post program (%)			X ²	P-value
	Always	Sometimes	Never	Always	Sometimes	Never		
Increasing food rich in fiber	58.00	41.00	1.00	93.00	7.00	0.00	32.24	<0.000**
Increasing fluid intake as allowed	45.00	54.00	1.00	95.00	5.00	0.00	59.55	<0.000**
Taking prescribed medication	25.00	55.00	20.00	45.00	53.00	2.00	21.30	<0.000**

Table (8): Distribution of CVD clients' self-care regarding smoking cessation pre and post program (n = 100).

Items	Pre program (%)			Post program (%)			X ²	P-value
	Always	Sometimes	Never	Always	Sometimes	Never		
Exercising regularly as walking	50.00	49.00	6.00	97.00	2.00	1.00	55.54	<0.000**
Presence of strong will	30.00	61.00	9.00	84.00	16.00	0.00	60.88	<0.000**
Reducing smoking gradually	45.00	54.00	1.00	95.00	5.00	0.00	59.55	<0.000**
Joining in manual work	14.00	26.00	60.00	82.00	9.00	9.00	87.61	<0.000**

Table (9): Distribution of CVD clients' self-care regarding hypertension control pre and post program (n = 100).

Items	Pre program (%)			Post program (%)			X ²	P-value
	Always	Sometimes	Never	Always	Sometimes	Never		
Exercising regularly as walking	42.00	40.00	18.00	95.00	5.00	0.00	65.73	<0.000**
Eating a Low-salt food	62.00	30.00	8.00	98.00	2.00	0.00	42.13	<0.000**
Reducing weight	27.00	48.00	25.00	86.00	9.00	5.00	71.43	<0.000**
Eating a low-fatty food	34.00	52.00	14.00	90.00	8.00	2.00	66.56	<0.000**
Preventing physical exertion and stress	40.00	20.00	40.00	87.00	13.00	0.00	58.88	<0.000**
Stopping smoking	43.00	32.00	25.00	90.00	10.00	0.00	53.13	<0.000**
Checking blood pressure regularly	37.00	43.00	20.00	90.00	10.00	0.00	62.67	<0.000**

Table (10): Distribution of CVD clients' self-care regarding diabetes mellitus control pre and post program (n = 100).

Items	Pre program (%)			Post program (%)			X ²	P-value
	Always	Sometimes	Never	Always	Sometimes	Never		
Exercising regularly as walking	48.00	46.00	6.00	95.00	4.00	1.00	55.54	<0.000**
Reducing weight	33.00	50.00	17.00	98.00	2.00	0.00	85.81	<0.000**
Eating a low-fatty food	40.00	46.00	14.00	88.00	10.00	2.00	50.14	<0.000**
Committed to a healthy food system	51.00	40.00	9.00	94.00	5.00	1.00	46.37	<0.000**
Committed to a healthy medical system	48.00	49.00	3.00	98.00	2.00	0.00	63.44	<0.000**

Table (11): Distribution of CVD clients' self-care regarding fatigue management pre and post program (n = 100).

Items	Pre program (%)			Post program (%)			X ²	P-value
	Always	Sometimes	Never	Always	Sometimes	Never		
Asking for help from others if needed	52.00	44.00	4.00	94.00	6.00	0.00	46.58	<0.000**
Managing time through the day	36.00	45.00	19.00	99.00	1.00	0.00	90.49	<0.000**
Arranging the work	50.00	40.00	10.00	86.00	14.00	0.00	32.05	<0.000**
Doing one work at a time	30.00	39.00	31.00	65.00	34.00	1.00	41.36	<0.000**
Using body mechanisms properly	26.00	44.00	30.00	53.00	47.00	0.00	38.69	<0.000**
Using suitable equipment while cleaning the house	56.00	21.00	23.00	97.00	2.00	1.00	48.57	<0.000**
Keeping on taking periods of rest and relax during the day	30.00	62.00	8.00	99.00	1.00	0.00	103.97	<0.000**
Doing breathing exercises during work	11.00	31.00	58.00	79.00	18.00	2.00	115.21	<0.000**
Keeping exercise constantly and regularly	49.00	30.00	21.00	94.00	6.00	0.00	51.16	<0.000**

Table (12): Distribution of CVD clients' self-care regarding stress control and anxiety pre and post program (n = 100).

Items	Pre program (%)			Post program (%)			X ²	P-value
	Always	Sometimes	Never	Always	Sometimes	Never		
Talking with someone close about anxieties and fears	52.00	39.00	9.00	94.00	5.00	1.00	46.37	<0.000**
Talking with other client who passed the same stage of stress and managed to overcome it	73.00	24.00	3.00	99.00	1.00	0.00	28.09	<0.000**
Listening to calm music	16.00	23.00	59.00	81.00	18.00	1.00	105.03	<0.000**
Accepting health condition and work within the limits of ability	57.00	20.00	23.00	83.00	17.00	0.00	28.07	<0.000**
Enjoying everything beautiful in life as much as possible	37.00	43.00	20.00	90.00	10.00	0.00	62.67	<0.000**
Avoiding thinking or focusing on problems of health	12.00	68.00	20.00	41.00	58.00	1.00	33.85	<0.000**
Exercising any favorite hobby.	10.00	46.00	44.00	88.00	12.00	0.00	126.01	<0.000**
Praying and listening to the Koran	75.00	23.00	2.00	92.00	8.00	0.00	13.48	<0.000**

Table (13): Distribution of clients' practices regarding measuring pulse rate pre and post program (n = 100)

Practice	Pre- program (%)			Post- program (%)			X ²	P-value
	Done completely	Done incompletely	Not done	Done completely	Done incompletely	Not done		
Assembling equipment (wrist watch with seconds)	4.00	19.00	77.00	73.00	26.00	1.00	196.040	<0.000**
Positioning the client's arm supported and rest	1.00	20.00	79.00	98.00	1.00	1.00	200.000	<0.000**
Firming hold of the clients' wrist, place first three fingers on your wrist bone just over radial artery, with sufficient pressure to feel the pulsation distinctly	3.00	20.00	77.00	95.00	5.00	0.00	195.667	<0.000**
Counting pulse for 60 seconds	0.00	1.00	99.00	66.00	31.00	3.00	188.350	<0.000**
Noting the rate and rhythm	0.00	2.00	98.00	36.00	63.00	1.00	196.040	<0.000**
Total Practice	Mean ± SD			Mean ± SD			Paired t- test	p-value
	1.15± 1.20			8.66 ± 1.33			46.97	<0.001**

Table (14): Total knowledge, self care and practices of CVD clients pre and post program (n = 100)

Items	Pre		Post		Paired t-test	
	Mean	± SD	Mean	± SD	t	P-value
Total knowledge	23.330	± 7.633	44.080	± 3.334	-49.829	<0.001**
Self care regarding proper nutrition	11.910	± 2.118	17.500	± 0.882	-25.071	<0.001**
Self care regarding avoiding obesity	8.000	± 1.614	11.340	± 0.997	-17.553	<0.001**
Self care regarding constipation management	4.080	± 0.939	5.300	± 0.674	-11.951	<0.001**
Self care regarding smoking cessation	4.630	± 1.228	7.460	± 0.758	-21.218	<0.001**
Self care regarding hypertension control	8.400	± 2.220	13.330	± 1.083	-18.124	<0.001**
Self care regarding diabetes mellitus control	6.750	± 1.192	9.700	± 0.689	-21.142	<0.001**
Self care regarding fatigue management	10.350	± 2.630	16.640	± 1.177	-21.187	<0.001**
Self care regarding stress control and depression	9.480	± 2.346	14.660	± 1.148	-21.241	<0.001**
Total Self care	62.500	± 7.436	94.830	± 3.569	-32.405	<0.001**
Total daily living activity	17.930	± 4.464	23.500	± 3.090	-9.790	<0.001**
Total practice	1.15	± 1.20	8.66	± 1.3	46.97	<0.001**

Table (15): Relation between client's total mean scores of knowledge and their socio-demographic characteristics.

Items	Socio-Demographic Characteristics	Knowledge Mean \pm SD	ANOVA	
			F	P-value
Age :				
30-		27.650 \pm 2.630	8.497	<0.001**
40-		23.517 \pm 5.944		
50 +		18.785 \pm 6.573		
Educational level:				
Illiterate		14.367 \pm 3.358	57.715	<0.001**
Read and write		19.860 \pm 3.748		
Basic education		21.215 \pm 3.473		
Secondary education		27.514 \pm 4.841		
University education		32.100 \pm 2.617		
Occupation :				
Employed		25.483 \pm 5.363	6.377	<0.000**
Housewife		22.000 \pm 8.128		
Private worker		21.833 \pm 5.347		
Retired		23.833 \pm 7.291		
Unemployed		16.910 \pm 3.821		
Sex :				
			T	P-value
Male		23.714 \pm 7.196	0.656	0.573
Female		22.9861 \pm 7.1353		
Income :				
Sufficient		23.286 \pm 67.178	3.886	<0.000**
Insufficient		18.771 \pm 6.356		

Table (16): Relation between clients' total mean scores of daily living activities, and their socio-demographic characteristics.

Socio- Demographic Characteristics Items	Daily living activities Mean \pm SD	ANOVA	
		F	P-value
Age :			
30-	16.350 \pm 3.594	1.279	0.312
40-	18.169 \pm 3.4547		
50 +	17.204 \pm 4.514		
Educational level :			
Illiterate	15.267 \pm 5.239	6.426	0.0231*
Read and write	18.100 \pm 4.822		
Basic education	17.375 \pm 5.496		
Secondary education	17.586 \pm 3.425		
University education	21.329 \pm 4.376		
Occupation :			
Employed	16.621 \pm 4.507	0.832	0.514
Housewife	17.433 \pm 4.715		
Private worker	17.200 \pm 4.3406		
Retired	17.433 \pm 5.293		
Unemployed	18.500 \pm 4.792		
		T	P-value
Sex :			
Male	16.794 \pm 4.582	0.617	0.607
Female	17.157 \pm 3.578		
Income :			
Sufficient	17.100 \pm 3.536	0.468	0.713
Insufficient	16.567 \pm 13.326		

Table (17): Relation between clients' total mean scores of self-care and their socio-demographic characteristics.

Socio- Demographic Characteristics Items	Self-Care Management Mean \pm SD	ANOVA	
		F	P-value
Age :			
30-	66.150 \pm 11.208	7.3136	0.004*
40-	61.917 \pm 76.848		
50 +	61.313 \pm 7.784		
Educational level :			
Illiterate	62.200 \pm 9.624	12.163	<0.001**
Read and write	63.650 \pm 10.433		
Basic education	63.850 \pm 3.864		
Secondary education	68.853 \pm 6.794		
University education	74.143 \pm 8.924		
Occupation :			
Employed	63.138 \pm 8.031	0.618	0.722
Housewife	63.963 \pm 8.090		
Private worker	65.333 \pm 8.399		
Retired	64.250 \pm 8.753		
Unemployed	61.250 \pm 7.284		
Sex :		T	P-value
Male	61.776 \pm 8.111	0.869	0.335
Female	65.392 \pm 6.524		
Income :			
Sufficient	66.053 \pm 7.455	4.326	-4.126
Insufficient	61.000 \pm 7.337		

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