

Effect of Educational Guidelines on Cardiac Self Efficacy, Health Complaints and Anxiety Level among Patients with Coronary Artery Disease

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Abstract

Coronary artery disease is one of the most prevalent cardiovascular diseases. Promotion of cardiac self-efficacy after a cardiovascular event is the outcome that plays a pivotal role in increasing rehabilitation skills to modify healthy behaviors. **Aim of this study:** was to evaluate the effect of educational guidelines on level of knowledge, self efficacy, health complaint, anxiety level of patients with coronary artery diseases. **Four tools were used in this study;** Patient structured interview questionnaire. Self efficacy scale. The somatic health complaints questionnaire (SHCQ) and Beck Anxiety Inventory. **This study was conducted** at cardiology unit & CCU at Ain shams university hospitals. A Purposive sample of (104) adult patients diagnosed with CAD, was selected and equally divided into study & control group, (52) patients for each one. **The finding of this study revealed** that there were highly statistically significant differences between study and control group regarding total mean scores of knowledge, self efficacy symptoms, all dimensions of health complaints and anxiety level scores ($p \leq 0.001$) at post and follow up guidelines intervention phases. **The study concluded that,** there was highly statistically significant improvement regarding the total post and follow up test satisfactory scores of knowledge, cardiac self efficacy, and cardiac exercise self efficacy, somatic health complaints and anxiety level for the study group subjects after implementation of the educational guidelines. **This study recommended** Provision of study educational guidelines in all health care settings providing services to CAD patients particularly address the patients with low educational attainments.

Key words: Coronary artery disease, Cardiac self efficacy.

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plaque (Smith, Negrelli, Manek, Hawes, & Viera, 2015).

Introduction

Coronary artery disease is the umbrella term for various syndromes of heart ischemia that are caused by atherosclerotic obstruction of the coronary arteries. The atherosclerotic damage ranges from gradual narrowing of the coronary arteries (due to bulging patches of plaque) to the sudden obstruction of a coronary artery by a blood clot that has been dislodged from the surface of a ruptured

Educational guidelines are relevant to the patient's level of understanding, comprehension, delivered at the appropriate time, as well as it can be one of the prerequisites for the patient to increase knowledge, practice, motivation and awareness of the importance of co-responsibility to make decisions about medical treatment and improving the patient's

outcomes (Bēta, 2014 and Koren & Sharaf, 2016). Longer education plays a causal role in lowering the risk of coronary heart disease. In conjunction with the results from other study designs, increasing education is likely to lead to health benefits (Marcus, 2014).

People who were provided educational guidelines subsequently developed less coronary heart disease. Increasing the number of years that people spend in the educational system may lower their risk of subsequently developing coronary heart disease by a substantial degree. These findings should stimulate policy discussions about increasing educational attainment in the general population to improve population health (Bēta, 2014 and Mohammed, Mohammed, & Al-Araby, 2016).

Self efficacy is "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations." In other words, self-efficacy is a person's belief in his or her ability to succeed in a particular situation. SE is an important concept because it ultimately affects behavior and outcomes. Self-efficacy is the most important predictor of change in behavior. (Rasheed, Nadeem, Rasheed, Kausar, Yasmin, & Shukat, 2012).

Cardiac Self Efficacy (CSE) is a cardiac-specific measure of a person's belief in their ability to perform activities which relate to the symptoms and challenges imposed by their cardiovascular disease. Cardiac Self Efficacy motivates individuals to make healthy lifestyle choices in regards to their CAD by creating a desire and willingness to adopt such behaviors. Self efficacy has been shown to affect health-related behaviors and health-related outcomes in the management of chronic disease patients, and is a very strong predictor of behavioral modification amongst patients of any age and state of health (Breux-Shropshire, 2012 & O'Neil, Berk, Davis & Stafford, 2013).

Health complaints, although subjective in nature, may provide information on the degree of recovery from CHD. In the weeks after a coronary event, patients frequently reported somatic (e.g., chest pain, dyspnea, fatigue, sleep problems) and cognitive (e.g., concern about health and functional status) health complaints. Somatic health complaints focused on "cardiopulmonary problems," "fatigue," and "sleep problems" symptom clusters (Malinauskas & Malinauskaiene, 2015)

Anxiety is prevalent in CAD patients. Patients with CAD often fear loss of their roles within society and the family. They may also fear that the pain may lead to an MI or death. Exploring the implications that the diagnosis has for the patient and providing information about the illness, its treatment, and methods of preventing its progression are important nursing interventions. Anxiety disorders are prevalent and associated with poor prognosis in patients with coronary artery disease (CAD). However, studies examining screening of anxiety disorders in CAD patients are lacking (Bunevicius, Staniute, Brozaitiene, JM Pop, Neverauskas, and Bunevicius, 2013).

Significance of the study

Coronary heart disease (CHD) is the most common of cardiovascular diseases and the most common cause of death in highly developed and industrialized countries, and it is rapidly increasing in developing nations of the third world. In many countries it is also the most common cause of hospitalizations and an important factor in work absenteeism. Coronary artery disease (CAD) is a major cause of morbidity and mortality worldwide. (Roger, Go & Lloyd-Jones, 2012).

According to the latest WHO data published in April 2011 coronary heart disease deaths in Egypt reached 78,897 which represent (21.73%) of total deaths. The age adjusted death rate is 173.98 per

100,000 of population and Egypt has been rank number 33 in the world (WHO, 2011).

Patient education is a major responsibility of nurses and plays a great role in, self efficacy improvement and converting patient from a dependent element to an independent and self sufficient person. Previous studies showed that patients with coronary artery diseases had deficit level of knowledge and practice before implementation of educational guidelines. Based on the recommendations of these previous studies, this paper addresses the effect of educational guidelines on self efficacy, health complaint, and anxiety level of patients with coronary artery diseases.

The overall aim of the study is to:

Evaluate the effect of educational guidelines on cardiac self efficacy, health complaint, anxiety level of patients with coronary artery diseases through:

1. Assessment of patient's level of knowledge.
2. Assessment of health complaint and anxiety level.
3. Developing and implementing educational guidelines according to patients' needs.
4. Evaluate the effect of an educational guidelines on patient's knowledge and cardiac self-efficacy post-guidelines intervention.
5. Evaluate the effect of an educational guidelines on patient's health complaints, and anxiety level post-guidelines intervention.

Hypothesis:

The current study hypothesized that:

- Study group will have a statistically significant better level of knowledge and cardiac self-efficacy post

educational guidelines intervention as compared to control group.

- Study group will have a statistically significant less health complaints and anxiety post educational guidelines intervention as compared to control group.

Operational definitions:

Self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. Such beliefs produce these diverse effects through four major processes. They include cognitive, motivational, affective and selection processes.

Health complaint: it concerned with 13 health problems common in cardiac patients including; chest pain, chest pain that limits daily activity, shortness of breath, shortness of breath during exertion, sweating, dizziness, headache, and stomach trouble, lack of energy, heart palpitations, tiredness, weakness, and sleep disturbance.

Educational guidelines:

Set of planned, educational activities designed to improve patients' self-efficacy, health complaints and anxiety level.

Subjects and methods

Research design:

Quasi-experimental research design was followed to achieve the aim of this study.

Technical Design:

The technical design includes research setting, subjects and tools for data collection.

Setting:

The study was conducted at cardiology unit & CCU at Ain shams university hospitals.

Subjects:

A Purposive sample of (104) adult patients diagnosed with CAD, was selected and equally divided into study & control group, (52) patients for each one.

The sample sizes determined by statistical analysis (power analysis) where it represents the total number of patients who are diagnosed with CAD in the cardiology unit at Ain shams university hospitals. At year 2014 which were (1044) patients.

Inclusion Criteria:

- Adult patients above 18 years, from both sexes, agree to participate in the study, not exposed before to any teaching or learning experiences regarding coronary artery diseases.

Exclusion Criteria:

- Patients with mental problems were excluded.

Tools for data Collection:

Data for this study were collected using the following tools:

A- Patient structured interviewing questionnaire:

An Arabic questionnaire, based on recent literature was developed by the researcher. It included the following parts:

- **Part 1: Demographic characteristics** of patients under study as regards to age, gender, residence, level of education and occupation.

- **Part 2: Past Medical History/life style**

It included series of questions to elicit patient's past medical history, compliance to medications, dietary pattern, sleeping pattern and smoking .

- **Part 3: patient learning needs assessment sheet**

It was developed by the researcher based on relevant and recent literatures based on (Murfin, 2010). It was used to assess the knowledge level of patients with CAD. It contains true & false and multiple choice questions (23) items including; definition of disease, causes, risk factors, signs and symptoms, diagnostic tests and management and disease related instructions.

Scoring system:

Patient's knowledge assessment sheet consisted of (45) items closed ended questions, and formed of multiple choice, the answer was evaluated using model key answer prepared by the researcher. the score 2 for correct answer, and 1 for incorrect answer. Total knowledge score was (90).

Tool II: self efficacy scale

This tool consists of 2 parts

Part 1: Cardiac self-efficacy scale

- This scale adopted from (Sullivan, Lacroix, Russo, and Katon, 1998). The cardiac self-efficacy questionnaire consisted of 13 items. Translation and re-translation from English to Arabic was done for this tool to assure accuracy for content validity.
- The cardiac self-efficacy scale measure two factors, maintain function (SEMF) and control symptoms (SECS). The first factor represented the confidence of the patients that they could control their

symptoms. The second factor represented the patients' confidence that they could maintain functioning. This scale actually had high internal consistency and good convergent and discriminate validity (Robertson & Keller 2009).

- **Scoring system:**

Patients were asked to rate their confidence with knowing or acting on each of the 13 statements on a 5-points scale (0 = not at all confident, 1 = somewhat confident; 2 = moderately confident, 3 = very confident, and 4 = completely confident). The items were first scored on a 5- point Likert scale ranging from 0 to 4, followed by summation. Higher scores indicated a greater level of cardiac self-efficacy in maintaining function and controlling symptoms.

Part 2: cardiac Exercise Self-Efficacy Scale (ESES):

- This scale adopted from (Hickey, Owen & Froman, 1992). It contains 16 items. The scale is a self-report questionnaire developed specifically to measure exercise self efficacy in a cardiac patients. It assesses patients' level of confidence in such exercise related items as performing warm-up and cool down, taking their heart rate and knowing what it should be, enduring strenuous and moderate exercise, and fitting exercise into a busy day. Translation and re-translation from English to Arabic was done for this tool to assure accuracy for content validity.

- **Scoring system:**

Patients were instructed to indicate their response on the 5-point rating scale (1 = no confident, 2 = very little confident; 3 = some confident, 4 = confident, and 5 = very confident) how confident they are with

regard to carrying out regular physical activities and exercise. Each question uses a five –point response scale with “1” represented the lowest and “5” the highest efficacy rating. It was classified as:

- **High cardiac exercise self-efficacy** if the score ≥ 70 % of the maximum score.
- **Low cardiac exercise self-efficacy** if the score < 70 % of minimum score.

Tool III: The Somatic Health Complaints Questionnaire (SHCQ):

- This questionnaire was adopted from (Brink, Cliffordson, Herlitz and Karlson, 2007) to measure fatigue in cardiac patients. It addresses 13 health complaints common in cardiac patients: chest pain, chest pain that limits daily activity, shortness of breath, shortness of breath during exertion, sweating, dizziness, headache, and stomach trouble, lack of energy, heart palpitations, tiredness, weakness, and sleep disturbance. The patients were asked to report how often these symptoms had occurred during the past week. Translation and back translation from English to Arabic was done for this tool to assure accuracy for content validity.

- **Scoring system:**

The patient response for each statement was made on a six-point likert scale, ranging from (1 to 6) as follow: 1=never, 2=once, 3=sometimes, 4=several times, 5=mostly, 6=always.

Tool IV: Beck Anxiety Inventory:

- This tool adopted from (Beck & Steer, 1990). It is a 21-items multiple-choice self-report inventory that measures the

severity of an anxiety in cardiac patients. Translation and back translation from English to Arabic was done for this tool to assure accuracy for content validity.

- **Scoring system:**

Each symptom item has four possible answer choices: Not at All; Mildly (It did not bother me much); moderately (It was very unpleasant, but I could stand it), and; severely (I could barely stand it). The clinician assigns the following values to each response: Not at All = 0; mildly = 1; moderately = 2, and; severely = 3. The values for each item are summed yielding an overall or total score for all 21 symptoms that can range between 0 and 63 points. A total score of 0 - 7 is interpreted as a "Minimal" level of anxiety; 8 - 25 as "Moderate" and 26 - 63 as "Severe".

- **Proposed educational guidelines:**

These educational guidelines were developed for patients with CAD to enrich them with information related to CAD, and measures to overcome of Complications, nutritional management and importance of healthy diet, and measures to improve patient's level of knowledge, health complains, self efficacy, health complaints and anxiety level.

- **Operational Design:**

The operational design includes preparatory phase, pilot study and field work.

- **Preparatory Phase:**

- It included reviewing of current and past available literature and theoretical knowledge of various aspects of the study using booklet, articles, internet, periodicals and magazines in order to develop the data collection tools.

- **Content validity:**

Content validity was conducted to test the tool for appropriateness, relevance, correction and clearance through a jury of seven experts, from the medical-surgical nursing staff at the faculty of nursing, Ain Shams University. Juries were from different academic categories (professors and assistant professors). Their opinions were elicited regarding the tool format layout, consistency and scoring system.

- **Testing reliability:**

- It tested by using cronbach alpha test the reliability scores of study tools including Arabic version for tool II, III, IV were (0.74, 0.91, 0.82 & 0.81) for patients interview questionnaire, self efficacy scale and The Somatic Health Complaints Questionnaire and Beck Anxiety Inventory: (SHCQ), respectively.

- **Pilot Study:**

A pilot study was applied on a group of 10 patients (10% of the sample) to test applicability of tools and clarity of the designed questionnaire, as well as to estimate the time needed to answer them. Patients included in the pilot study were also included in the main study subject, because there were no modifications in the tools.

- **Field Work:**

This study was conducted through **three** phases: Assessment phase, Educational guidelines implementation phase (Theoretical & practical stage) and Evaluation Phase:

- **Assessment phase:**

In this phase the researcher collected data from both groups (study & control) starting with control group to prevent contamination of the sample. The time

needed for completing study tools was about (20-35 minutes) for each patient.

Implementation phase:

Data collection was started and completed within 6 months followed by 3 months for follow up test in the period from beginning of January 2015 until end of August 2015.

Purpose of study was explained by the researcher to patients who agreed to participate in the study prior to any data collection; the study sample divided into study and control group. The study tools were filled in and completed by the researcher three times on 3 stages (pre & post and follow up guidelines intervention phases).

The researcher was available at cardiology unit & CCU at Ain shams university hospital 3 days/week at morning and afternoon shifts to collect data from the studied patients. Filling in the tools was done according to the patients` understanding and health condition.

In this phase the developed educational guidelines were implemented by the researcher for the study group only. The researchers started to discuss educational guidelines with the patient. Patients were also informed to be in contact with the researcher by telephone. The educational guidelines were delivered at cardiology unit for every 3 to 4 patients together according to their education level and understanding. The educational guidelines were supported by using posters, power points and booklet. Patients were allowed to ask questions in case of misunderstanding while listening and expressing interest for them. At the end of these sessions the researcher emphasized the importance of the follow up visits and informed them that they will be followed by the researcher after three months.

- **Evaluation phase:**

This phase was performed to both study and control groups post immediate & after three months (follow up) and it included reassessment using the same tools of data collection which aimed to evaluate the effect of implementation of the educational guidelines on patient`s knowledge, cardiac self efficacy, health complaints and anxiety. It was tested by comparing the results of the data collected post immediate & after three months from the study and control groups.

Administrative Design:

To carry out the study, the necessary approvals were obtained from the hospital director and nursing director of Ain Shams University Hospitals. Official letters were issued to them from the Faculty of Nursing explaining the aim of the study to obtain permission for the collection of data.

Ethical Considerations:

An oral consent was taken from patients who agree to participate in the research process. The agreement for participation of the subjects was taken after the aim of the study has been simply explained to them prior to data collection. They were assured that anonymity and confidentiality would be guaranteed and the right to withdraw from the study at any time without giving any reason. Values, culture and beliefs would be respected.

Statistical Design:

Data collection obtained, they were organized, categorized, tabulated and analyzed. Data were presented in tables, figures and diagram using the Statistical Package for Social Science (SPSS). Statistical significant associations were assessed using percentage (%), mean, standard deviation, t-test and p-value.

Results

Table (1): Demographic characteristics of the study and control group subjects.

Items	(Total No =104)				Chi square	p value
	Study (n=52)		Control (n=52)			
	No	%	No	%		
Age (in years)						
20-	0	0	1	1.9	0.274	0.78
30-	3	5.8	4	7.7		
40-	9	17.3	10	19.23		
50-	28	53.8	19	36.5		
60+	12	23.07	18	34.6		
Mean ± SD	54.21 ± 8.01		54.71 ± 10.42			
Gender					0.000	1.000
Male	31	59.6	31	59.6		
Female	21	40.4	21	40.4		
Marital status						
Married	37	71.2%	40	76.9%		
Not married	15	7.8%	12	23.1%		
Educational level					1.209	0.751
Illiterate	15	28.8	15	28.8		
Read and write	23	44.2	27	51.9		
Basic education	11	21.2	7	13.5		
High education	3	5.8	3	5.8		
Occupation					1.551	0.671
Sedentary	5	9.6	3	5.8		
Muscular work	14	26.9	18	34.6		
Retired	10	19.2	7	13.5		
No work	23	44.2	24	46.2		
Residence						
Rural	8	15.4	17	32.7	4.265	0.039
Urban	44	84.6	35	67.3		

Not significant (NS) $p > 0.05$

Table (I): illustrates that 53.8% of the study group and 36.5% of the control group were in the same age group from 50 years to less than 60 years old with mean age (54.71 ±10.42) and (54.21±8.01) respectively .Regarding gender, 59.6% of study and control groups were males. Concerning marital status, 71.2% and 76.9 of study and control groups respectively were married.

As regard to level of education, 44.2% of study group and 51.9% of control group can read and write. Regarding patient's occupation, 26.9% of the study group and 34.6% of control group had

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muscular work while, 44.2% and 46.2% of study and control groups respectively were not working. Concerning the residence, 84.6% of study group and 67.3% of control group were living in urban areas.

The results showed also, that there were no statistically significant differences between study and control group subjects regarding all aspects of demographic characteristics at $p > 0.05$.

Table (2) Percentage distribution of the study and control group subjects as regards health history and lifestyle aspects.

Items	Total No (N =104)				Chi square	p value
	Study (n=52)		Control (n=52)			
	No	%	No	%		
Diabetes	22	42.3	25	48.1	0.349	0.554
Hypertension	38	73.1	40	76.9	0.205	0.651
Angina	31	59.6	33	63.5	0.163	0.687
IHD	14	26.9	27	51.9	6.804	0.009
Others						
-COPD	10	19.2	14	26.9	0.369	0.543
- Pulmonary embolism	8	15.4	7	13.5		
Cardiac catheterization	13	25.0	19	36.5	1.625	0.202
Cardiac balloon	2	3.8	0	0.0	2.039	0.153
Cardiac support	2	3.8	5	9.6	1.378	0.24
Open heart surgery	1	1.9	2	3.8	0.343	0.558
A-Compliance with medication						
- Complete compliance	9	17.3	7	13.5	2.965	0.227
- Incomplete compliance	42	80.8	40	76.9		
- No Compliance	1	1.9	5	9.6		
B- Dietary patterns						
Weight gain	16	30.8	18	34.6	0.175	0.676
Weight loss	11	21.2	7	13.5	1.075	0.3
Preferred Cereals	0	0.0	1	2.7	1.068	0.301
Preferred Proteins	5	12.8	5	13.5	0.008	0.929
Preferred Vegetables & fruits	24	61.5	22	59.5	0.034	0.835
Preferred Fat and fried foods	30	76.9	31	83.8	0.564	0.453
Preferred Citrus fruits	36	92.3	33	89.2	0.221	0.638
Taking Rest after meals	48	92.3	48	92.3	0	1
C- Sleeping patterns						
Sleeping hours						
< 4	46	88.5	49	94.2	1.095	0.295
4-8	6	11.5	3	5.8		
8+	0	0.0	0	0.0		
Feeling comfort after sleep						
Yes	18	34.6	13	25.0	1.146	0.284
No	34	65.4	39	75.0		
D-Smoking						
Yes	11	21.2	16	30.8	1.303	0.521
No	24	46.2	22	42.3		
Ex-smoker	17	32.7	14	26.9		

Not significant (NS)

$p > 0.05$

Table (2): showed that 42.3% and 48.1% of study and control groups respectively had D.M while, 73.1% and 76.9% of study and control groups respectively had hypertension. Moreover, 59.6% and 63.5% of study and control groups respectively had angina. 26.9% of study group and 51.9% of control group had IHD. It is obvious from the above table that 25.0% of study group and 36.5% of control group had previous history of cardiac catheterization.

However, 80.8% & 76.9% of study and control groups respectively had incomplete compliance with medication pre-program implementation. 30.8% and 34.6% of study and control groups respectively had weight gain, meanwhile 76.9% & 83.8% of study and control groups respectively preferred fat foods. Regarding sleep patterns, only 17.3% & 9.6% of study and control groups respectively had enough sleep. Also, 57.7% & 59.6% of study and control groups respectively had orthopnea. Concerning smoking, 21.2% & 30.8% of study and control groups respectively were smokers.

Table (3): Comparison of total mean score of patient's knowledge of study and control group subjects at pre, post and follow up guidelines intervention.

Items	Study group (n=52)	Control group (n=52)	T-tets	p- value
	Mean ± SD	Mean ± SD		
Total Knowledge				
- Pre-test	20.99 ± 8.89	22.92 ± 10.62	3.091	0.125
- Post-test	78.02 ± 10.12	24.08 ± 10.26	25.993	<0.001**
- Follow up- test	74.50 ± 10.72	21.68 ± 10.26	22.753	<0.001**

* Significant (S) $p \leq 0.05$ ** Highly Significant (HS) $p \leq 0.001$ Not significant (NS) $p > 0.05$

Table (3): shows that there were no statistical significant differences between control and study group subjects pre- guidelines intervention regarding patient's total mean scores of knowledge. While highly statistically significant differences was found between both groups at post and follow up guidelines intervention phases in total mean scores of knowledge at $p \leq 0.001$.

Table (4): Comparison of total mean scores of cardiac Self Efficacy of the study and control group subjects at pre, post and follow up guidelines intervention.

smetI	Study Group (n=52)	Control group (n=52)	F ratio	p value
	Mean ± SD	Mean ± SD		
Self Efficacy control Symptoms				
- pre-test	1.54 ± 2.36	1.62 ± 2.03	0.859	0.178
- post-test	9.25 ± 5.30	2.69 ± 2.30	8.184	0.000**
- Follow up test	7.98 ± 3.96	2.42 ± 1.98	7.989	0.000**
Self Efficacy Maintaining function				
- pre-test	0.19 ± 0.74	0.29 ± 0.94	0.725	0.169
- post-test	4.46 ± 3.53	0.56 ± 1.26	7.514	<0.001**
- Follow up test	4.17 ± 3.07	0.54 ± 1.23	7.204	<0.001**

**** Highly Significant (HS) p ≤ 0.001**

This table shows that there were highly statistically significant differences between the study and control group subjects at post and follow up guidelines intervention regarding SECS and SEMF while, there was no statistically significant differences between the study and control group subjects at pre-guidelines intervention regarding Self Efficacy control Symptoms and Self Efficacy Maintaining function.

Table (5): Comparison between study and control group subjects regarding Cardiac Exercise Self Efficacy (CESE) scores at pre , post & follow up guidelines intervention phases.

Items	puorG				Chi square	p value
	ydutS (n=52)		lortnoC (n=52)			
	No	%	No	%		
CESE (pre- test)						
Low exercise self-efficiency	47	90.4%	50	96.2%	1.378	0.24
High exercise self-efficiency	5	9.6%	2	3.8%		
CESE (post- test)						
Low exercise self-efficiency	10	19.2%	50	96.2%	63.03	<0.001**
High exercise self-efficiency	44	84.6%	2	3.8%		
CESE (follow up- test)						
Low exercise self-efficiency	8	15.4%	50	96.2%	68.762	<0.001**
High exercise self-efficiency	42	80.8%	2	3.8%		

**** Highly Significant (HS) p ≤ 0.001**

Not significant (NS) p > 0.05

Table (5): shows that there were highly statistically significant differences between study and control group subjects at post and follow up guidelines intervention phases regarding CESE at $p < 0.001$. While there was no statistical significant difference between study and control group subjects pre guidelines intervention regarding cardiac exercise self efficacy at $p = 0.24$.

Table (6): Comparison of mean scores of somatic health complaints between study and control group subjects at pre, post and follow up guidelines intervention.

Items of somatic health complaints	Study group (n=52)	Control group (n=52)	t-test	p value
	Mean±SD	Mean±SD		
Pre-test				
1-Fatigue	17.90 ± 3.21	17.65 ± 2.43	-.448	.655
2- Pain	15.73 ± 2.13	16.87 ± 2.59	2.438	.016
3-Breathlessness	8.87 ± 1.79	9.12 ± 2.03	.666	.507
4- Unrest	13.56 ± 1.61	13.87 ± 1.44	4.357	.623
Post- test				
1-Fatigue	7.17 ± 2.86	15.25 ± 2.06	16.530	<0.001**
2- Pain	8.52 ± 1.97	14.98 ± 2.50	14.649	<0.001**
3-Breathlessness	4.85 ± 1.43	7.87 ± 1.72	9.740	<0.001**
4- Unrest	6.77 ± 1.79	12.13 ± 1.68	15.762	<0.001**
Follow- up test				
1-Fatigue	7.44 ± 2.86	15.38 ± 2.07	16.120	<0.001**
2- Pain	8.79 ± 1.93	15.46 ± 2.19	15.019	<0.001**
3-Breathlessness	4.94 ± 1.30	7.92 ± 1.71	9.125	<0.001**
4- Unrest	6.77 ± 1.74	12.15 ± 1.67	15.662	<0.001**

** Highly Significant (HS) $p \leq 0.001$ Not significant (NS) $p > 0.05$

Table (6): Regarding all dimensions of health complaints scale (fatigue, pain, breathlessness and unrest), there were highly statistically significant improvement among study group subjects as compared to control group at post and follow up guidelines intervention at $p < 0.001$, while, there was no statistically significant difference between study and control group subjects at pre guidelines intervention at $p > 0.05$.

Table (7): Comparison between the study and control group subjects pre, post and follow up guidelines intervention regarding Beck anxiety scores.

smetI	Group				Chi square	p value
	Study (n=52)		Control (n=52)			
	No	%	No	%		
Beck anxiety (pre)					2.067	0.356
Minimal anxiety	0	0.0%	2	3.8%		
Moderate anxiety	21	40.4%	21	40.4%		
Severe anxiety	31	59.6%	29	55.8%		
Beck anxiety (post)					62.571	<0.001**
Minimal anxiety	47	90.4%	7	13.5%		
Moderate anxiety	5	9.6%	29	55.8%		
Severe anxiety	0	0.0%	16	30.8%		
Beck anxiety (follow up)					55.254	<0.001**
Minimal anxiety	42	80.8%	5	9.6%		
Moderate anxiety	8	15.4%	22	42.3%		
Severe anxiety	2	3.8%	25	48.1%		

** Highly Significant (HS) $p \leq 0.001$ Not significant (NS) $p > 0.05$

Table (7): There were highly statistically significant differences between study and control group subjects post and follow up guidelines intervention regarding beck anxiety level scores ($p < 0.001$), While, there was no statistical significant difference between study and control group subjects pre guidelines intervention ($p = 0.356$).

Table (8): Relation between cardiac self efficacy (SECS and SEMF) mean scores and total satisfactory scores of knowledge between study and control group.

Items	Total Satisfactory Scores Of Knowledge							
	Study group				Control group			
	Unsatisfactory	Satisfactory	T-test	Significance	Unsatisfactory	Satisfactory	T-test	Significance
	Mean ±SD	Mean ±SD			Mean ±SD	Mean ±SD		
SECS	6.96 ± 3.66	11.92 ± 5.73	3.77	<0.001**	1.17 ±1.56	1.73 ±2.27	1.21	0.36
SEMF	2.96 ± 3.23	6.21 ± 3.08	3.69	0.00	.52 ±.51	.63 ±1.30	.05	0.94

** Highly Significant (HS) $p \leq 0.001$ Not significant (NS) $p > 0.05$ * Significant (S) $p \leq 0.05$

- **SECS** : Self Efficacy control Symptoms
- **SEMF** : Self Efficacy Maintaining function

Table (8): shows that there was highly statistically significance relation between cardiac self efficacy control symptoms and satisfactory scores of knowledge among study group subjects at $p < 0.001$. However, there were no statistically significance relation between cardiac self efficacy (SECS and SEMF) and total satisfactory scores of knowledge among control group subjects ($p = 0.36$ & 0.94 respectively).

Discussion

Coronary artery diseases touch the lives of millions of patients and their families, together with those who provide and plan care, and those responsible for planning and funding care especially in developing countries like Egypt. Indeed, the WHO estimates that 60% of the global burden of CAD occurs in developing countries (**Beltrame, Dreyer and Tavella 2012 & Kern, 2016**).

Nurses play a critical pivotal role in delivering care through patient assessment, safety, support and education. To deliver optimal care, nurses need to prepare the patient adequately both physically and emotionally. (**Mohammed, 2014**).

The aim of the present study is to evaluate the effect of educational guidelines on patients' knowledge, self efficacy, health complaints, and anxiety level of patients with coronary artery diseases.

Regarding demographic characteristics of patients under study, the result of the present study revealed that more than half of study group and about one third of control group subjects were in the same age group from 50 years to less than 60 years old with mean age (54.71 ± 10.42) and (54.21 ± 8.01) respectively. This mean age of the present study may be due to aging which is an un-modifiable risk factor for CAD. The WHO reports that CAD risk increase as age increases. In many developing countries, the number and proportion of older people is increasing (**Kucia, & Quinn, 2010**).

In this context, **Poortaghi, Baghernia, Golzari, Safayian and Atri (2013)** found that the majority of study sample were between 30 to 60 years old. However **Kotb , Hsieh and Wells (2014)** found that the majority of study sample were between 50 to 70 years old. **Azer, Alaa Eldeen, Abd-Elwahb & Ahmed (2011)** found that less than half of study sample were below 40 years. This can be interpreted as; CAD can affect different age groups.

As regards gender, the present study clarified that more than half of study and control group subjects were males. This result is in accordance with **Bazargani, Besharat, Ehsan, Nejatian and Hosseini (2011)**, who found that more than half of study subjects were males. However this result is inconsistent with **Allahverdipour, AsghariJafarabadi, Heshmati and Hashemiparast (2013)** who reported that nearly more than half of study sample were females.

Concerning educational level, this study result revealed that less than half of the study group and about half of control group subjects can read and write. This may be due to low education is a causal risk factor in the development of coronary heart disease. This result is consistent with **Whalley et al., (2011)**, as they studied the "Psychological interventions for coronary heart disease", and mentioned that half of their study subjects were at the elementary level. While on the other hand, this result is inconsistent with **Subramanian, Sutherland, and McCoy (2010)**, in a study titled "Facility-level factors influencing chronic heart failure care process performance in a national integrated health

delivery system", that less than half of their study subjects had high education.

As regards patients' occupation, the present study result indicated that, less than half of study and control group subjects were not working. This may be due increasing age level among the studied subjects and the fact that CAD patients refrained of job due to activity intolerance. This result is in agreement with **Abdel Monem (2011)**, who mentioned that half of the studied patients were not working, while these results are in disagreement with **Meng et al., (2015)**, in a recent study, who denoted that the majority of the sample consisted of employed persons.

Regarding patients' residence, the current study results showed that; the majority of the study group and slightly more than two thirds of control group were living in urban areas. This is supported by **Sekhri (2014)** who concluded that there was a high prevalence of CAD risk factors in urban population. This result is incongruent with **Falcoz et al., (2013)**, in a research article titled "Open heart surgery: One-year self-assessment of quality of life and functional outcome", that more than half of study patients reside rural areas.

In the current study, the results showed that there were no statistically significant differences between study and control group subjects regarding all aspects of demographic characteristics, this result indicates that both study and control groups are compatible.

Considering medical history, the present study indicated that less than half of study group and control group subjects had

diabetes mellitus. This may be due to that the majority of the of the patients were within 30-50 years and this age group commonly is high risk for D.M. This result is in accordance with **Maeda (2012)**, who mentioned that more than one fifth of study patients had diabetes mellitus. As well, this result goes on line with **Allahverdipour, AsghariJafarabadi, Heshmati and Hashemiparast (2013)** who found that nearly one third of studied sample had diabetes mellitus.

In the same line, the present study indicated that more than two thirds of study and control group subjects had hypertension. This may be due to that hypertension is predisposing factor to CAD. This result is in accordance with **Breaux-Shropshire, (2012)**, who mentioned that more than two thirds of study patients had hypertension. Also this result is in accordance with **Shin, Hwang, Jeong and Lee (2013)** who mentioned that more than half of study patients had hypertension.

Concerning history of cardiac catheterization the present study finding showed that one fourth of the study group and more than one third of control group subjects had previous cardiac catheterization. This may be due to that most CAD patients experience cardiac catheterization as a routine investigation for diagnosis of CAD. In this context, **Kumar, Zehr, Chang, Cameron and Baumgartner (2011)**, mentioned that less than one fifth of their studied patients had previous cardiac catheterization. Also, **Loponen (2009)**, found that the minority of the studied subjects had previous cardiac catheterization.

Regarding to compliance with medications, the present study indicated that

more than three fourths of study and control group subjects had no compliance with medication as they reported. This is congruent with **Bazargani, Besharat, Ehsan, Nejatian and Hosseini, (2011)** who mentioned that the minority of their studied patients had complete compliance with medication. While this result is inconsistent with **Szygula-Jurkiewicz, Zembala, Wilczek, Wojnicz and Polonski (2011)**, who mentioned that, the majority of their studied subjects take medications regularly.

Regarding knowledge among study and control group subjects at pre, post and follow up guidelines intervention. The results of the current study revealed that there were no statistical significant differences between control and study group subjects pre-guidelines intervention regarding patient`s total mean scores of knowledge. Also, the results of the current study supported the current study hypothesis and highly statistically significant differences were found between study and control groups regarding patient`s total mean scores of knowledge at post and follow up guidelines intervention phases. This indicates the improvement of patient's knowledge as a result of guidelines intervention as well as the permissive atmosphere of conduction as patients were allowed to ask questions giving them actual chance to participate.

This result goes on line with **Tawalbeh and Ahmad (2013)**, who found that the change in the mean knowledge scores was statistically significant after the application of the educational program. Also this result is consistent with **Tawalbeh and Ahmad (2014)** in a similar study titled "*the effect of cardiac educational program on the level of knowledge and adherence to healthy lifestyle among patients with coronary artery*

disease in the north of Jordan" that implementing cardiac educational programs for CAD patients achieved a high level of knowledge and self-care providing information to patients about treatment regimens that will increase their tolerance and compliance.

On the same line, **Meng et al., (2015)**, reported that educational process organized by nurses for patients after a cardiac event improves patients' knowledge in relation to their illness and awareness of behavioral changes to prevent a new event or readmission to hospital and this reference supported the explanation given by the researcher.

This result is consistent with **Aminpour et al. (2014)**, who mentioned that there were statistically significant difference in total knowledge scores of study group post program implementation and added that the individualized teaching might be helpful at reducing the risk factors of atherosclerosis in patients with CAD. Also this result is goes on line with **Reilly et al. (2012)**, who mentioned that there were statistically significant differences in total knowledge scores of study group after implementing of the educational program.

Also this result is accordance with **Meng et al. (2015)**, who reported that the educational program produced improvement in knowledge and physical activity compared with usual routine care. However, **Zhang, Jiang Yin, Chen, Ma and Wang (2011)** clarified that, Education that focuses on the patient is associated with increased patient satisfaction, improve knowledge, reduce levels of anxiety and depression, high levels

of compliance to treatment, as well as improved self efficacy of cardiac patient. Furthermore **Mensah and Himmelfarb (2012)** added that the educational interventions had a positive effect on knowledge and these references supported the explanation given by the researcher.

Concerning level of knowledge of control group there were no statistically significant improvement regarding the total – post and follow up test satisfactory scores of knowledge. This may be related to that the control group didn't receive the educational guidelines intervention. This result is consistent with **Aminpour, Shahamfar, and Shahamfar (2014)**, who studied the effects of lifestyle modification program in reduction of risk factors in patients with coronary heart disease in Iran and mentioned that there was no statistical significant improvement regarding the total pre-post test satisfactory scores of knowledge in the control group. Also this result is supported by the results of **Kavaniyil et al. (2009)**, who mentioned that knowledge score was very low in control group.

It was hypothesized in the present study that Study group will have a statistically significant better level of cardiac self-efficacy post educational guidelines intervention as compared to control group.

The results of the present study supported this hypothesis which, there were highly statistically significant improvement in the study group subject as compared to result of control group post and follow up guidelines intervention regarding self efficacy control symptoms (SECS) and self efficacy maintaining function (SEMF) total mean scores. This may be attributed to the

effect of educational guidelines in improving cardiac self efficacy of CAD patients.

This result goes on line with **Robertson et al. (2009)**, who studied the relationships among health beliefs, self-efficacy, and exercise adherence in patients with coronary artery disease, and denoted that the majority of study group had moderate confident to some extent regarding SECS and SEMF post implementation of educational program. Also, **Poortaghi, Baghernia, Golzari, Safayian and Atri (2013)** found that there were highly statistically significant improvement in the study group subject as compared to result of the control group in the post and follow up phases of the program implementation regarding SECS and SEMF total mean scores.

Additionally, **Bazargani et al. (2011)** underlined that the educational programs for CAD patients, increase adherence and self-efficacy acts as a mediator. Also **Intarakamhang and Intarakamhang (2013)** mentioned that patient with CAD had experienced increases in their self-efficacy, self-regulation, self-care, and quality of life scores after interventional process and these references supported the explanation given by the researcher.

Bachmann et al. (2015), in a study entitled "*Health self-efficacy is associated with increased physical activity in patients with coronary heart disease*", exhibited that, there were highly statistically significant differences between pre-post and follow up phases of program implementation in the study and control group subjects regarding SECS and SEMF. **O'Neil et al. (2013)** revealed also that there were highly

statistically significant differences between pre-post and follow up program implementation in the study and control group subjects regarding cardiac self efficacy.

The present study indicated that there were no statistical significant differences between control and study group subjects regarding SECS and SEMF total mean scores pre program implementation. This result is consistent with **Tavakolizadeh, Tabari, and Akbari (2015)** in a study titled "*Academic self-efficacy: predictive role of attachment styles and meta-cognitive skills in Iran*" that there were no statistical significant relations between control and study group subjects regarding SECS and SEMF pre program implementation. Also they added that a low level of self-efficacy was correlated to coronary artery disease patient's pre implementation of the educational program.

Cardiac exercise self efficacy scale (CESES) developed specifically to measure exercise self efficacy in cardiac patients. CESE often has a greater influence on the return to normal activities than actual medical status. it can outperform functional evaluation in predicting exercise compliance in cardiac patients (**Vidmar & Rubinson, 2009**).

Concerning Cardiac exercise self efficacy , the present study showed that there were highly statistically significant differences between study and control group subjects at post and follow up guidelines intervention phases regarding CESE. This may reflect the positive effect of educational guidelines in improving CESE. This result is inconsistent with **Paryad, Hosseinzade, Kazemnejad and Asiri (2013)**, who studied

"A study of self-efficacy in patients with coronary artery disease and its predictors", In this cross-sectional study, he mentioned that more than one fourth of study sample had desirable exercise self-efficacy.

On the same line, **Piepoli et al. (2010)** reported that implementing exercise program allow CAD patients to exercise independently and maintain the recommended lifestyle modifications. Increased physical activity and enhanced physical fitness can promote cardiovascular health, provided that the patient keeps up with the exercise program and this reference supported the explanation given by the researcher.

In the same line, **Haddadzadeh, Maiya, Padmakumar, Shad and Mirbolouk (2011)** in a study titled "*the effect of exercise-based cardiac rehabilitation on ejection fraction in coronary artery disease patients*" that there were highly statistically significant differences between study and control group post program implementation and in the follow up phases regarding CESE. Also, **Mampuya (2012)** stated that the cardiac rehabilitation program for CAD patients improved exercise tolerance and risk factors modification.

Somatic Health Complain Questionnaire (SHCQ) is a predictive tool for indicating impaired physical functioning and mental well-being. SHCQ represents four dimensions: breathlessness, fatigue, pain and unrest (**Brink, Cliffordson, Herlitz, & Karlson, 2007**).

Regarding the effect of the educational guidelines on health complaints, There were highly statistically significant

improvement among study group subjects as compared to control group at post and follow up guidelines intervention regarding all dimensions of somatic health complaints (Fatigue, pain, breathlessness and unrest) , **which support the current study hypothesis**, while, there was no statistically significant difference between study and control group subjects at pre guidelines intervention. This may be due to effect of the educational guidelines intervention in reducing the four dimensions of health complaints in CAD patients. This result is consistent with the results of **Skodova et al. (2010)**, who found that there were highly statistically significant differences between study and control group subjects after program implementation phase regarding four dimensions of SHCQ.

In the same context, **Bunevicius, Stankus, Brozaitiene, Girdler and Bunevicius (2011)** in a research article titled "Relationship of fatigue and exercise capacity with emotional and physical state in patients with coronary artery disease" that there were highly statistically significant differences between study and control group subjects post program implementation. Also **Smith et al. (2010)** examined the role of clinical and psychological characteristics as predictors of fatigue in CAD. Also he reported that increased exercise capacity after the educational program was associated with decreased fatigue and this reference supported the explanation given by the researcher.

It is noticed from the current study that there were no statistical significant difference between control and study group subjects pre program intervention regarding

SHCQ (Fatigue, pain, breathlessness & unrest). This may be due to fatigue is common in CAD patients. This result is consistent with **Brink (2012)** in a study titled "Dimensions of the somatic health complaints questionnaire (SHCQ) in a sample of myocardial infarction patients" that there were no statistically significant difference between control and study group subjects pre program implementation regarding SHCQ. Moreover, he added that fatigue was the most significant variable associated with CAD, which was interpreted as having the following clinical implication.

Congruently **Skodova et al. (2010)**, added that patient with low educational level seems to be strongly associated with higher fatigue among patients; a significant factor contributing to worse prognosis and lower self efficacy among patients with coronary heart disease.

It was hypothesized in this study that Study group will have a statistically significant less anxiety post educational guidelines intervention as compared to control group. This hypothesis was supported through study results as there were highly statistically significant differences between study and control group regarding total anxiety level scores at post and follow up guidelines intervention phases, While, there was no statistical significant difference between study and control group subjects pre guidelines intervention.

The above result reflects the positive effect of educational guidelines in relieving anxiety post educational intervention. This explanation is supported by **Kotb, Hsieh and Wells (2014)**, who evaluated the effect of telephone support interventions on coronary artery disease and patient outcomes during cardiac rehabilitation and mentioned that patients receiving the educational intervention had significantly lower depression and anxiety scores.

This result is consistent with **Shin et al., (2013)**, who identified that there were highly statistically significant differences between pre, post and follow up implementation in the study group. Also this result goes on line with **Allahverdipour, AsghariJafarabadi, Heshmati, and Hashemiparast (2013)**, who stated that there were highly statistically significant differences between pre, post and follow up implementation in study group.

It's noticed from the finding of the current study that, most of study group had very low anxiety level in post and follow up phases of implementing the educational program. This may be due to effectiveness of educational program in reducing anxiety. The results also revealed that there were highly statistically significant differences between control and study group subjects as regard reducing anxiety scores post program intervention. **Sullivan, LaCroix and Baum (2009)**, in a study titled "*Functional status in coronary artery disease: A one-year prospective study of the role of anxiety and depression*", that patients exposed to cardiac educational program had better functioning, less anxiety, and reported more self-efficacy with respect to maintaining functioning.

Finally, the current study findings shows that there was highly statistically relation between cardiac self efficacy (SECS) and satisfactory scores of knowledge among study group subjects. However, there were no statistically significance relation between cardiac self efficacy (SECS and SEMF) and total satisfactory scores of knowledge among control group subjects .This result indicated statistical significant improvement of self efficacy scores of study group subjects which may be due to the effectiveness of educational guidelines intervention.

This explanation is supported by **Edraki et al. (2014)**, who reported that education has a vital role in improving knowledge and self efficacy of patients with CAD and consequently improving their QOL.

Conclusion

Based on the findings of the present study, it can be concluded that:

There were highly statistically significant improvement regarding the mean scores of total knowledge, cardiac self efficacy (SECS and SEMF), and cardiac exercise self efficacy, somatic health complaints and anxiety level for the study group at the post and follow up phases of the educational guidelines intervention. As compared to control group, there was no statistically significant relations between total pre-post and follow up test scores of knowledge and cardiac exercise self efficacy.

The results of the current study supported the hypothesis of the study that, there were statistically significant differences between study and control groups in relation to knowledge, cardiac self efficacy, and cardiac exercise self efficacy, somatic health complaints and anxiety level at post and follow up guidelines intervention. These findings conclude that educational guidelines had a positive effect on patient knowledge, cardiac self efficacy health complaints and anxiety level.

Recommendations

Based on the current study findings the following recommendations can be suggested:

- Improving patient's self efficacy should be the main objective for nurses during their care of patients with CAD.
- Provision of study educational guidelines in all health care settings providing services to CAD patients particularly address the patients with low educational attainments.
- Future researches are required to develop and refine interventions to improve patient's compliance to treatment and prevent further deterioration.
- Develop and coordinate a multidisciplinary team approach in cardiology unit that contains qualified nurse, cardiology, psychologist and social worker to help CAD patients in maintaining normal life style at highest possible level.
- Replication of the study on a larger probability sample selected from different geographical areas in Egypt is recommended to obtain more generalizable data.
- Conduction of educational programs for patients is needed about risk factors and prevention methods of coronary artery diseases programs for patients with CAD to help in improving health status of these patients.

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