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## RESEARCH ARTICLE

# IMPACT OF EDUCATIONAL PROGRAM FOR ANGINAL PATIENTS ABOUT PREVENTIVE MEASURES OF ANGINA PECTORIS

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### ABSTRACT

This study was carried out on 111 patients recording in cardiac outpatients of general hospitals at Port Said city. The aim of this study was to evaluate impact of educational program for anginal patients about preventive measures of angina pectoris. The data was collected using one tool; "Structured questionnaire sheet" which consists of 31 questions related to socio-demographic characteristics, angina pectoris, and preventive measures of angina pectoris. The result of this study indicated that there are statistically significant improvements at p-value (0.001) immediately after program implementation regarding patients' knowledge about preventive measures of angina pectoris. Moreover, it was also found statistically significant relation between patients' knowledge and total scores of their knowledge. There is statistically significant associations between the changes in the scores of either knowledge and socio-demographic characteristics (age, and duration of disease) while there is no statistically significant associations between their knowledge and educational level. Therefore, it can be concluded from the results of the present study that the training program for nurses had a positive impact on their knowledge and practice.

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## INTRODUCTION

Angina attack is chest pain or a sensation of pressure that occurs when the heart muscle is not getting enough oxygen. It tends to develop in women at a later age than in men<sup>[1]</sup>. The American Heart Association (AHA) has estimated that over 9 million people in the United States suffer from angina pectoris, which significantly impacts quality of life, ability to work, and costs to society. Among patients who undergo coronary artery angiography for the evaluation of angina, a significant proportion of them, mainly women, are found to have normal-appearing epicardial coronary arteries<sup>[1, 2]</sup>.

Stable angina is not life-threatening on its own. However, it is a serious warning sign that the patients have an increased risk of life-threatening problems, such as a heart attack or stroke<sup>[3, 4]</sup>. Chronic stable angina (CSA) is a significant and prevalent problem in the United States that can negatively impact quality of life (QoL). Data from the Centers for Disease Control and Prevention indicate that in 2011 approximately 7.8 million people in the United States aged greater than 20 years

experienced angina. More than 500,000 people aged greater than 45 years are diagnosed with CSA each year<sup>[5, 6]</sup>.

In a recent study of CSA incidence, 29% of patients with CSA attending primary care practices experienced at least 1 episode of angina per week<sup>[7]</sup>. According to WHO, World Bank, UNESCO, *et al.*<sup>[8]</sup> reported that Coronary Heart Disease Deaths in Egypt reached 107,232 or 23.14% of total deaths. The age adjusted Death Rate is 186.36 per 100,000 of population ranks Egypt #23 in the world<sup>[4]</sup>. So the aim of this study is to evaluate impact of educational program for anginal patients about preventive measures of angina pectoris.

Angina occurs when the heart does not get enough oxygen, which results in a tightness, pressure, burning or pain in the chest and/or the neck, jaw, back, shoulders, or arms. Sometimes it's a sense of unusual fatigue or shortness of breath. The discomfort or pain from angina is often confused for indigestion. Angina is not actually a disease; it is a symptom of coronary artery disease (CAD blockages in the bigger arteries in the heart) and coronary micro vascular disease (MVD blockages in the smaller arteries in the heart).

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This means that the underlying causes of angina are a result of blockages in the arteries of the heart; both the bigger arteries and the smaller arteries<sup>[9]</sup>.

Therefore, Singh<sup>[10]</sup> assured that smoking, high amounts of fat and cholesterol in your blood, high blood pressure and a high amount of sugar in the blood due to diabetes or insulin resistance are all factors that contribute to blockages in your heart arteries and symptoms of angina.

The two main types of angina are stable angina and unstable angina. Stable angina -where angina attacks occur due to an obvious trigger (such as exercise) and improve with medication and rest. While unstable angina - where angina attacks are more unpredictable, occurring with no obvious trigger and continuing despite resting. Unstable angina should be regarded as a medical emergency because it is a sign that the function of the heart has suddenly and rapidly deteriorated, increasing patient risk of having a heart attack or stroke<sup>[9]</sup>.

The most common risk factors of the angina include smoking, family history, hypertension, obesity, diabetes, high alcohol consumption, lack of exercise, stress, and hyperlipidemia<sup>[2]</sup>. Smoking is associated with about 54% of cases and obesity 20%. Lack of exercise has been linked to 7–12% of cases. Job stress appears to play a minor role accounting for about 3% of cases<sup>[11, 12, 13]</sup>

The most complications of angina is atherosclerosis which will continue to get worse. This can lead to the blood supply to the heart becoming blocked, which could trigger a heart attack. Similarly, a blockage of the blood supply to the brain could trigger a stroke. Each year it is estimated that 1 in every 100 people with stable angina will have a fatal heart attack or stroke and as many as 1 in 40 people will have a non-fatal heart attack or stroke<sup>[10]</sup>.

Lifestyle modification is an integral component of therapy for patients with angina & It will favorably impact the adverse cardiovascular risk factor profile in many patients with angina. Exercise training improves angina, exercise capacity, and mortality in patients with coronary disease. Preventive measures of angina involves exercise, decreasing obesity, treating hypertension, a healthy diet, decreasing cholesterol levels, stopping smoking, and control blood sugar in diabetes. Medications and exercise are roughly equally effective<sup>[14]</sup>.

In diabetes mellitus, there is little evidence that very tight blood sugar control improves cardiac risk although improved sugar control appears to decrease other problems like kidney failure and blindness. The World Health Organization (WHO) recommends "low to moderate alcohol intake" to reduce risk of coronary artery disease although this remains without scientific cause and effect proof<sup>[15]</sup>.

Treatment of angina aims to provide immediate relief from the symptoms, prevent future attacks and reduce your risk of further complications<sup>[10]</sup>. Finally The current guidelines from the American College of Cardiology Foundation and American Heart Association(ACCF/AHA) guidelines highlight the importance of educating patients about the etiology, clinical manifestations, treatment options, and prognosis of their disease, supporting active patient participation in treatment decisions, and using evidence-based pharmacological

treatments that improve the patients' health status and survival with minimal side effects and the ACCF/AHA guidelines also recommend that patients with nursing research and practice stable heart disease be educated about the importance of lifestyle modifications, such as smoking cessation, blood pressure (BP) control, and weight, lipid, and diabetes management in improving their QoL. Increased exercise tolerance may also reduce cardiovascular (CV) risk and enhance quality of life (QoL) in patients with Chronic stable angina (CSA) who have comorbid type 2 diabetes mellitus (T2DM), and exercise is recommended by the American Diabetes Association for improving QoL and blood glucose control and contributing to weight loss in patients with T2DM.

In patients with T2DM, a structured exercise program has been shown to lower glycosylated hemoglobin by 0.66% and may reduce the risk of diabetic complications<sup>[17, 18, 19]</sup>. So the aim of this study is to evaluate impact of educational program for anginal patients about preventive measures of angina pectoris.

### ***Problem Statement***

There is an urgent need to evaluate impact of educational program for angina patients about preventive measures of angina pectoris because the importance of modification of multiple risk factors of chronic stable angina will reduce mortality from ischemic heart disease (IHD). Hence, it will control patients' lifestyle.

### ***Aim Of study***

To evaluate impact of educational program for anginal patients about preventive measures of angina pectoris.

## **MATERIAL AND METHODS**

### ***Research Design***

The design of this study is quasi –experimental design done to evaluate impact of educational program for anginal patients about preventive measures of angina pectoris.

### ***Setting***

The study was conducted in 3 cardiac outpatients of general hospitals at Port Said city.

### ***Subjects***

The population of this study consisted of 111 patients who have recording in cardiac outpatients of general hospitals at Port Said city.

### ***Tool for data collection***

One tool was used in the study "structured questionnaire sheet":-

It was developed by the researcher based on the review of related nursing literature to evaluate impact of educational program for anginal patients about preventive measures of angina pectoris.

It comprised of two parts.

**Part I**

It included items related to socio-demographic characteristics of the studied patient such as sex, age, educational level, occupational status, and duration of angina pectoris.

**Part II**

It included 26 question related to patients' knowledge regarding angina pectoris; (definition, causes, signs and symptoms, risk factors, complications, and preventive measures).

**Pilot study**

A pilot study was carried out after the development of the tool. It was carried out on 10 patients in cardiac outpatients of general hospitals at Port Said city to test the reliability and applicability of the tool of the study. The necessary modifications were done based on the results of the pilot study.

**Ethical Considerations**

Permission to conduct the study was obtained from the responsible authorities after explanation its purpose. The tools were tested for their content validity and clarity by 9 experts in nursing field and doctors specialized in the management of patients with **cardiac diseases** and appropriate modification was done accordingly.

Data was obtained from each patient prior to their inclusion in the study after explaining its purpose and importance. Confidentiality of the information was assured by the researcher.

**This study was conducted in four phases**

- Ñ **Phase I (Assessment phase):-** to assess patients' knowledge about preventive measures of angina pectoris. The researcher interviewed the patients on individual bases the researcher introduced the sheet (**Tool I**) to the patient and asked them to complete it. Most of them spent about 30 minutes in the interview.
- Ñ **Phase II (program planning):-**The educational program was developed based on the identified needs and demands of patients gathered in phase I, and in the light of the most recent pertinent literature.
- Ñ **Phase III (program implementation):-**The patients were divided in 3 groups according to their hospital. The educational program was implemented for each group of patients in each hospital. It lasted for one month and two weeks, it included six sessions two session per week. Each session took about 30 minutes. The program was presented in clear and concise form, and focused on the point of learning, using different teaching methods such as discussions, lecture, demonstration, and redemonstration. The developed program a booklet was distributed to the participant.
- Ñ **Phase IV(Evaluation phase):** The program outcome were evaluated by using tools I. two time; first preprogram, second immediately after the implementation of program.

**Scoring system**

The total score of patient' knowledge against the 2 basic items was calculated to be 44.The respondent was given one point for each correct answer and zero for incorrect one. For each part,

the scores of the items were summed up. These scores were converted into a percent score.

Total score of 60%and more was considered satisfactory in knowledge while scores below 60% was considered unsatisfactory.

**Statistical analysis**

After data were collected, they were coded and transformed into a specially designed format suitable for computer feeding. All entered data were verified for any errors. Data were analyzed using statistical package for social sciences (**SPSS**) windows 17.0 version and were presented in tables

**RESULTS**

**Table (1) Socio-Demographic Characteristics of angina Patients**

Items	N n= (111)	
	Count	Percentage %
Sex	Male	60 54.1%
	Female	51 45.9%
Age	35-<45	12 10.8%
	45-<55	20 18.0%
	55-<65	30 27.0%
	65-<75	27 24.3%
	75+	22 19.8%
	Non Educated	35 31.5%
Educational Level	Primary	18 16.2%
	Intermediate	16 13.5%
	Secondary( diploma)	28 25.2%
Occupational Status	Bachelor Degree	14 13.6%
	Working	33 29.7%
	Not Working	78 70.3%
Duration of angina	<1	4 3.6%
	1-<5	10 9%
	5-<10	39 35.1%
	10-<20	43 38.7%
	20+	15 13.5%

Table (1) shows the socio-demographics characteristics of studied patients. About half of studied patients (54.1%) were male and about more than one third of studied patients (45.9%) were female. As regards age, about (27.0%) of patients were from 55 years and less than 65 years, and about (10.8%) of patients were from 35 years and less than 45 years.

As regards to their educational level, about one third of studied patients (31.5%) were non educated, about less than one third (25.2%) of patients had secondary certificate, and minority of studied patients (13.6%) had bachelor certificate.

About more than two third of studied patients (70.3 %) don't work. As regard to their duration of angina pectoris, about more than one third (35.1%, 38.7% respectively) were from five years to less than ten years and from ten years to less than 20years.

Table (2): Shows differences in patients' knowledge regarding angina throughout the program intervention. The results indicated improvements of patients' knowledge in various areas of angina.

These improvements were statistically significant at p-value (0.001). The most prominent improvement was in the score of knowledge about Signs and Symptoms, and risk factors of angina pectoris. It reached (96.4%, 84.7% respectively) in the

immediate post-test. Moreover the percentages of satisfactory level in all knowledge areas improved in the posttest. The levels were significantly higher than the pre-program levels (pretest).

Table (3): Shows differences in patients' knowledge regarding preventive measures of angina throughout the program intervention. The results indicated improvements of patients' knowledge in various areas of preventive measures of angina pectoris .These improvements were statistically significant at p-value (0.001).

**Table 2** Differences in patients' knowledge regarding angina throughout the program intervention.

Patient's knowledge about	Time				Z	P
	Pre test		Immediately post test			
	Count	%Percentage	Count	Percentage %		
Definition	37	33.3%	70	63.1%	4.371	0.001
Causes	27	24.3%	84	75.7%	6.862	0.001
Signs and Symptoms	81	73.0%	107	96.4%	4.914	0.001
Types of angina	26	23.4 %	63	56.8%	5.181	0.001
Risk factors	59	53.2%	94	84.7%	5.000	0.001
Complications	32	28.8%	70	63.1%	5.078	0.001

patients' knowledge, between the immediate posttest and the pre-program level (84.34±9.44) where t=14.912 at p – value (0.001).

Table (5): shows correlation between patients' knowledge regarding angina pectoris and their sociodemographic throughout the program intervention. There are statistical significance difference was found between patients' knowledge, their age groups and duration of disease.

**Table 3** Differences in patients' knowledge regarding preventive measures of angina throughout the program intervention.

Patient's knowledge about preventive measures	Time				Z	P
	Pre test		Immediately post test			
	Count	%Percentage	Count	Percentage %		
Low salt diet	91	82.0%	106	95.5%	3.441	0.001
Low fat diet& avoid heavy eating	79	71.2%	109	98.2%	5.477	0.001
Cigarette smoking cessation	45	40.5%	87	78.4%	5.612	0.001
Regular exercises& avoiding physical inactivity	49	44.1%	67	60.4%	2.546	0.011
Adequate rest& sleep	75	67.6%	108	97.3%	5.245	0.001
Avoid a stressful situation	71	64.0%	108	97.3%	5.925	0.001
Avoid exposure to cold weather	50	45.0%	101	91.0%	7.141	0.001
Avoid excessive coffee	76	68.5%	101	91.0%	4.490	0.001
avoid excessive Physical activities	69	62.2%	108	97.3%	6.091	0.001
Control blood pressure ( hypertension)	53	47.7%	102	91.9%	6.379	0.001
Control sugar in blood (diabetes mellitus)	48	43.2%	99	89.2%	6.640	0.001
Control weight	47	42.3%	101	91.0%	6.971	0.001

The most prominent improvements were in the scores of knowledge about Low fat diet& avoiding heavy eating, adequate rest& sleep, avoiding a stressful situation, and avoiding excessive Physical activities. They reached (98.2%, 97.3%, 97.3%, 97.3%, and 97.3%, respectively) in the immediate posttest. Moreover the percentages of satisfactory level in all knowledge areas improved in the posttest. The patients' knowledge levels were significantly higher than the preprogram level (pretest).

**Table 4** Comparison of mean patients' knowledge total score regarding angina pectoris throughout the program intervention.

Variables	Mean	±SD	t	p
Knowledge pre educational program	52.04	± 19.39	-----	-----
Knowledge immediately post educational program	84.34	±9.44	14.912	0.001

Table (4): shows comparison of mean patients' knowledge total score regarding angina pectoris throughout the program intervention. The highest percentages of improvement were in

It demonstrated statistically significant relationship between patients' knowledge their age groups and duration of disease where (rho =-0.339, and -0.394 respectively) at p- value (.001\*). Meanwhile there were statistically insignificant relationship between patients' knowledge and educational level where (rho=-0.250) at p-value (0.008).

**Table 5** Correlation between patients' knowledge regarding angina pectoris and their sociodemographic throughout the program intervention.

Variables	Age		Educational level		Duration of disease	
	rho	p	rho	p	rho	p
Knowledge pre educational program	-0.339	0.001	0.250	0.008	-0.394	0.001
Knowledge immediately post educational program	-0.199	0.037	-0.017	0.860	-0.133	0.165

## DISCUSSION

Angina is an important clinical manifestation of coronary heart disease. In addition, in patients with angina the risk of future

cardiovascular events can be prevented with aggressive secondary prevention [20, 21, 22].

The concept that coronary heart disease (CHD) can be prevented has increasingly become a driving force in cardiovascular medicine. For many years, the field gave lip service to prevention but neglected to take it seriously. The possibility of effective prevention was met with skepticism from many quarters. Gradually, however, the tide has turned, and prevention is getting the upper hand. Widespread acceptance of the benefits of prevention came first in the area of secondary prevention, ie, preventing recurrent coronary events in patients with established CHD. Secondary prevention stands at the boundary between prevention and treatment. Many cardiologists consider secondary prevention to be treatment of coronary artery disease; others see it as prevention of recurrent coronary events. There is a more uniform agreement that prevention of new-onset CHD should be called primary prevention [23, 24].

In addition to strategies for impacting risk factors associated with secondary events in patients with CHD have been used frequently, although relatively few data have been reported about the effectiveness of these interventions in older patients. Benefits for these patients, including those 75 years of age where possible, are described here. Traditionally, components of secondary prevention programming (including exercise; smoking cessation; management of dyslipidemia, hypertension, diabetes, and weight; and interventions directed at depression, social isolation, return to work, and other psychosocial issues) have been provided by the clinician in the office setting or through cardiac rehabilitation programs. Cardiac rehabilitation programs are particularly well suited to the provision of secondary prevention services, but unfortunately, many older patients who would derive benefit from these interventions do not participate because of lack of referral or a variety of societal and other barriers [19,24]. So the aim of this study was to evaluate impact of educational program for angina patients about preventive measures of angina pectoris.

The results of the present study revealed that about half of studied patients were male and about more than one third of studied patients were female. Most of them were at the age group from 55 years and less than 65 years. These results were supported by the overall prevalence of angina was 28/1000 in men and 25/1000 in women (1.57 first, 7.70 recurrent and 20.65 persistent). The prevalence of angina was lower in women than men at all ages ( $p < 0.05$ ). In men the prevalence was extremely low in those  $< 45$  (1/1000) increasing to 141/1000 in those  $\geq 75$  years. In women the prevalence of angina was 108/1000 in those  $\geq 75$  years. The highest prevalence in both sexes was in the age range 75–84 years. Although the prevalence was higher in men than in women, the greater number of elderly women in the population meant that more women than men aged  $\geq 75$  years had angina and that, overall, almost as many women as men had angina. [25,26].

Moreover, the findings of the present study showed that about more than one third (35.1%, 38.7% respectively) were from five years to less than ten years and from ten years to less than 20 years regarding to their duration of angina pectoris. These results might be due to that about one third of studied patients were non educated, and the majority of studied patients don't work. These results were agreement with Murphy [25] increased

steeply with age and with increasing socioeconomic deprivation. Women and older patients were less likely to receive evidence-based treatment.

The results of the present study revealed that the improvements in post-program levels were significantly higher than the pre-program levels (pretest). These results might be due to that impact of educational program improved their knowledge about preventive measures of angina pectoris. These results were congruent with Alexander [27] who found that a wide variety of secondary prevention programs improve health outcomes in patients with coronary disease. The overall aging of the American population and improving survival of patients with coronary heart disease (CHD) has created a large population of older adults (65 years of age) eligible for secondary prevention. Increasing evidence has accumulated over the past 2 decades that elderly individuals with CHD can benefit greatly from exercise training and other aspects of secondary prevention. [28,29]

The results of the present study revealed that the improvements in post-program levels were significantly higher than the pre-program levels (pretest) in various areas related to preventive measures as (low salt diet, low fat diet & avoiding heavy eating, cigarette smoking cessation, regular exercises, adequate rest & sleep, avoiding a stressful situation, avoiding exposure to cold weather, avoiding excessive coffee, avoiding excessive Physical activities, control blood pressure (hypertension), control sugar in blood (diabetes mellitus), and Control weight. These results might be due to that importance of controlling risk factors to avoid recurrence of angina and an educational program emphasized modified risk factors which play basic role in prevention of recurrence of angina.

These results supported by Mark, *et al.*, [30] who reported that secondary prevention interventions to impact and control risk factors in older patients with CHD, including habitual cigarette smoking, hypertension, abnormal blood lipids, elevated blood glucose, obesity, various psychological concerns, and physical inactivity, appear effective to an extent similar to that observed in younger patients. Greater involvement of the elderly in these programs is needed to fully realize the therapeutic and secondary preventive potential.

Moreover, the several studies added that the regular physical activity using large muscle groups, such as walking, running, or swimming, produces cardiovascular adaptations that increase exercise capacity, endurance, and skeletal muscle strength. Habitual physical activity also prevents the development of coronary artery disease (CAD) and reduces symptoms in patients with established cardiovascular disease. There is also evidence that exercise reduces the risk of other chronic diseases, including type 2 diabetes, osteoporosis, obesity, depression, and cancer of the breast and colon [31,31,32,33,34,35,36,37].

The results of the present study revealed that there are statistical significance difference between patients' knowledge, their age groups and duration of disease. These results might be due to the majority of studied patients were from 55 years to more than 70 years and the duration of disease from 5 to twenty years that period are enough time to be awareness about their disease and be more knowledgably and effect of educational program about preventive measures of angina.

These results supported by Mark, *et al.*,<sup>[30]</sup> who stated that provide an update on the benefits of specific secondary prevention risk factor interventions in this age group and, where possible, to delineate benefits in the older elderly ( 75 years of age). An increased awareness on the part of physicians, nurses, third-party payers, and patients and their families of the benefits of secondary prevention programs to older adults will provide a basis for referral and aid in the implementation of such programming.

## CONCLUSION

Based on the results of the present study, the following were concluded:

1. There are statistically significant improvements at p-value (0.001) immediately after program implementation regarding patients' knowledge about preventive measures of angina pectoris.
2. It was also found statistically significant relation between patients' knowledge and total scores of their knowledge.
3. There is statistically significant associations between the changes in the scores of either knowledge and socio-demographic characteristics (age, and duration of disease) while there is no statistically significant associations between their knowledge and educational level.

## Recommendation

1. A well organized and structured continuous education program should be established at Primary Health Centers for anginal patients.
2. Health care providers should take time to explain in depth on angina, causes and prevention/control through health and self-care measures to prevent complications.
3. Family members of diabetic patients should also be counseled to adopt a healthy lifestyle in order to prevent diabetes.
4. Studies on similar context but with wider scope and much larger sample size are recommended to confirm finding of this study.

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