

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**Shendi University**

**Faculty of Graduate Studies and Scientific  
Research**

**Impact of A proposed Educational Program  
for Nurses about Nursing Care of Patients  
with Coronary Artery Diseases  
At Elmek Nimir University Hospital**

**A research Submitted for PhD Degree in Medical Surgical Nursing**

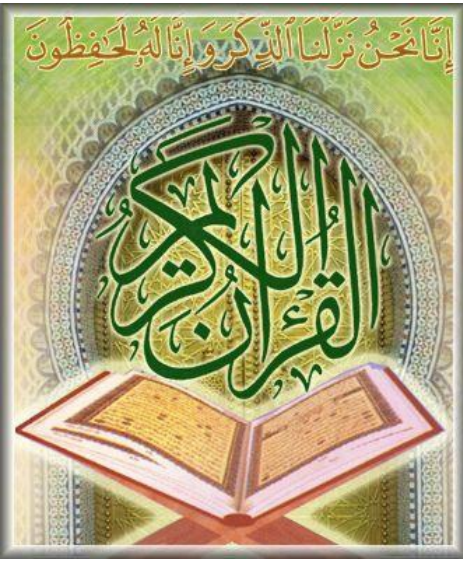
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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال تعالى:

(فَتَعَالَى اللَّهُ الْمَلِكُ الْحَقُّ وَلَا تَعْجَلْ بِالْقُرْآنِ مِنْ قَبْلِ أَنْ يُقْضَىٰ إِلَيْكَ

وَحْيُهُ وَقُلْ رَبِّ زِدْنِي عِلْمًا)

صدق الله العظيم

الآية (114) من سورة طه

# Dedication

*To my mother for her support, constant encouragement, patience and understanding at all times.*

*To my dear father who gave me enough instructions, guidelines, interpreting and constant sustained me throughout my life.*

*To my dear brothers and my sister who gave me advices, efforts, and helped me to complete my study.*

*To my friends and colleagues, who gave me enough support and encouragement during this study?*

*With best wishes*

# Acknowledgement

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## List of abbreviations

Abbreviations	Meaning
ANA	American Nurses Association
CAD	coronary artery disease
CHD	Coronary heart disease
INR	international normalized ratio
TLC	therapeutic lifestyle changes
LDL	Low density lipoprptein
BRFSS	Behavioral Risk Factor Surveillance System
MI	myocardial infarction
NTG	nitroglycerin
ECG	electrocardiogram
ACS	acute coronary syndromes
PCI	Percutaneous coronary intervention
COPD	chronic obstructive pulmonary disease
NSAIDs	nonsteroidal anti-inflammatory drugs
APTT	activated partial thromboplastin time
ICU	intensive care unit
SpO2	oxygen saturation
ABGs	Arterial blood gases
ICDs	Implanted cardioverter defibrillators
ADL	activities of daily living
HDL	high-density lipoprotein
NPO	nothing per mouth
PTT	partial thromboplastin time
SMBG	self-monitoring of blood glucose

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## **Abstract**

Education, an important nursing intervention, promotes understanding of the coronary artery diseases, health maintenance, prevention of complications, and early recognition of symptoms. This quasi experimental study was carried out in Shendi city at Elmek Nimer University Hospital in a period of (2008-2013). The general aim of this study is to conduct CAD educational program for nurses so as to help patients to control CAD disease. sixty nurse were involved in this study. Before the program was applied the knowledge and practice of these nurses was assessed by structural standard questionnaire contain 40 questions. The questionnaire designed by the researcher to assess the knowledge of nurses about CAD in regard to the definition of the disease, risk factors, self management program, and life style change. The practice of these nurses was evaluated by observational check lists for some educational procedures which include (exercise, nutrition, obesity, chronic diseases, emotional health, and compliance of medications).

Then the nurses were received educational program about CAD for four months. After four months the same questionnaire and check list were used to collect mid test data and then after four other months later also the same tools were used to collect post intervention data. The collected data from all three tests were manage and analyses by statistical package for social sciences (SPSS). After analysis the collected data presented in form of tables and figures .The results of this study illustrated that (56.7%) of nurses had not attended education program about CAD yet. (75%) of study group were aware about CAD after the implementation of the program, while before conduction of the program they aware (28.3%) about CAD. The study illustrates that the mean of

nurses knowledge about self management program is (26.4%). These findings are before the program intervention, but in first ongoing assessment the mean of nurses knowledge was (72.5%). while in last post intervention assessment, the mean of nurses knowledge about self management program is (78.3%). additionally to this the study found that there was a gap between nurses knowledge and practice towards modifiable risk factors pre and post intervention .Nurses were illustrating unsatisfied knowledge and practice before implementation of the program. But illustrating satisfied knowledge, and demonstrating satisfied practice after implementation of the program.

(33.3%) of nurses were demonstrated good practice when performing teaching process before application of the program, and (73.3%) of them were demonstrated good practice when performing teaching process after intervention of the program. In spite of these good practice nurses were not compliance with education of patients during their daily practice. To ensure perfect application and compliance with this program, the study recommends that Create nurses must undergo training program to maximize their experiences and qualification to insure good quality of nursing care and prevent patients from complications.

## ملخص البحث

اجريت هذه الدراسة الشبه تجريبية بمدينة شندى فى مستشفى الملك نمر الجامعى فى الفترة من 2008 الى 2013. ان الهدف العام من هذه الدراسة هو تصميم برنامج لتطوير العناية التمريضية لمرضى الشرايين التاجية . شملت هذه الدراسة 60 ممرض وممرضة. قبل اجراء هذه الدراسة تم تقييم معرفة واداء الممرضين والمرضات عن كيفية العناية بمرضى الشرايين التاجية بواسطة استبانة تقييم احتوت على 40 سؤال صممت بواسطة الباحث. وقيمت اداءهم لبعض المهارات التعليمية مثل تعليم المريض كيفية تجنب العوامل المؤهبة للمرض وتغيير نمط الحياة والاعتماد على المعالجة الذاتية بواسطة قوائم تحقيق صممت على نظام تدرج.

بعد هذا التقييم الاولى تعرض الممرضين والمرضات لبرنامج تدريبي على كيفية العناية بمرضى الشرايين التاجية لمدة اربعة اشهر وبعد فترة اربعة اشهر استخدمت نفس الادوات الاستبانة وقوائم التحقق التى استخدمت فى التقييم الاولى لتقييم معرفة واداء الممرضين والمرضات للتقييم للمرة الثانية ومن ثم بعد اربعة اشهر اخرى استخدمت نفس الادوات لتقييم معرفة واداء الممرضين والمرضات للمرة الثالثة .

تم تفريغ المعلومات التى جمعت بهذه الادوات وعولجت البيانات ببرنامج الحزم الاحصائية للعلوم الاجتماعية وتم مقارنة النتائج بواسطة معامل ارتباط كاي. بينت نتائج هذه الدراسة ان 56.7% من الممرضين والمرضات لم يحضروا برنامج للعناية بمرضى الشرايين التاجية من قبل. 28.3% من مجموعة الدراسة معرفتهم جيدة بامراض القلب التاجية قبل تنفيذ البرنامج وان 75% لديهم معرفة جيدة بعد عملية تنفيذ البرنامج .

كما اوضحت الدراسة ان متوسط معرفة عينة الدراسة عن المعالجة الذاتية هو 26.4%. ولكن فى التقييم الثانى بلغ متوسط المعرفة 72.5% . بينما فى التقييم الاخير بعد تطبيق البرنامج اصبح متوسط المعرفة 78.3%.

توصلت نتائج هذه الدراسة الى ان هنالك فجوة بين معرفة وتطبيق الممرضين للعوامل المؤهبة لامراض القلب التاجية قبل وبعد تطبيق البرنامج حيث كانت النتيجة ضعيفة قبل التطبيق اما بعد تطبيق البرنامج كانت المعرفة والمهارات بصورة جيدة. توصلت نتائج هذه الدراسة الى ان هنالك فجوة بين معرفة وممارسة الممرضين للعملية التعليمية حيث ان 33.3% منهم اظهروا تطبيق عملى جيد للعملية التعليمية قبل تنفيذ البرنامج . وان 73.3% منهم اظهروا اداء جيد للعملية التعليمية بعد تنفيذ البرنامج . وعلى الرغم من هذا الاداء الجيد الا ان اغلبية الممرضين لا يلتزمون بممارسة العملية التعليمية كاحد المهام الاساسية لتجويد العناية بالمريض اثناء عملهم بالمستشفى الامر الذى يثير عدة تساؤلات عن عدم هذه الممارسة. لكي

نضمن تنفيذ هذا البرنامج بصورة جيدة توصي هذه الدراسة بتقديم برامج تدريبية لزيادة الخبرة وتجويد الاداء التمريضى وتقديم نصائح وارشادات كافية لمرضى الشرايين التاجية للوقاية من حدوث المضاعفات.

## **Introduction:**

Florence Nightingale, who wrote in 1858 that the goal of nursing was “to put the patient in the best condition for nature to act upon him,” nursing leaders have described nursing as both an art and a science. However, the definition of nursing has evolved over time. The American Nurses Association (ANA), in its Social Policy Statement (ANA, 1995), defined nursing as “the diagnosis and treatment of human responses to health and illness” and provided the following illustrative list of phenomena that are the focus for nursing care and research, Self-care processes, Physiologic and pathophysiologic processes Comfort, pain, and discomfort, Emotions related to experiences of health and illness Environmental systems. <sup>(1)</sup>

The heart is a muscle about the size of your fist. It pumps blood around the body and beats approximately 70 times a minute. After the blood leaves the right side of the heart, it goes to the lungs where it picks up oxygen .The oxygen-rich blood returns to the heart and is then pumped to the organs of your body through a network of arteries. The blood returns to your heart through veins before being pumped back to your lungs again. This process is called circulation .The heart gets its own supply of blood from a network of blood vessels on the surface of the heart, called coronary arteries.

Coronary artery disease (CAD) could be result of obstructed blood flow through the coronary arteries to the heart muscle. The primary cause of coronary artery disease is atherosclerosis. If blood flow reduction resulting from CAD is severe and prolonged, a myocardial infarction (heart attack) can occur, causing irreversible damage. Atherosclerosis and arteriosclerosis is, an accumulation of fatty deposits and minerals in the coronary arteries, which called an atheroma or plaque, leads to stenosis and eventually occlusion of the artery. In CAD, blood flow to the

myocardium is reduced. If myocardial oxygen demands are not met, ischemia results, which can lead to chest pain. The pain associated with CAD occurs from a lack of oxygen to the myocardium as a result of the CAD and is referred to as angina pectoris. <sup>(2)</sup>

Coronary heart disease (CHD) is usually associated with one or more characteristics known as risk factors. A risk factor is an aspect of personal behavior or lifestyle, an environmental exposure or an inborn or inherited characteristic, which on the basis of epidemiologic evidence is known to be associated with the occurrence of disease. Several aspects of the association between a potential risk factor and the disease are evaluated before an association is considered causal. <sup>(3)</sup>

Patient education is an integral part of nursing care. It is the nurse's responsibility to assist the patient to identify the learning needs and resources that will restore and maintain an optimal level of functioning. Teaching learning process, including learning barriers and teaching responsibilities of nurses. Patient education is extremely important today in a health care environment that demands cost effective measures. With shorter hospital stays, patients are being discharged to the home or other health care settings in more critical condition than ever before. patient education is a hallmark of quality nursing care, is a fiscally responsible intervention that encourages health care consumers to engage in self-care and to develop healthy lifestyle practices. <sup>(4)</sup>

Teaching Patients Self-Care Learning about the modifiable risk factors that contribute to the continued development of CAD Exploring with the patient and family what they see as their priority in managing the disease and developing a plan based on their priorities can assist with patient adherence to the therapeutic regimen. It is important to explore with the patient methods to avoid, modify, or adapt the triggers for CAD.

Patients can often be managed with lifestyle modifications and medications to control symptoms of angina. The most important factor is patient education. Patients need to understand the importance of their symptoms and when to seek medical attention. <sup>(5)</sup>

Most risk factors for heart disease are related to lifestyle and environmental factors. The guidelines for prevention of heart disease by the American Heart Association target the risk factors that have the potential for change. Educating patients on cessation of smoking, dietary changes, controlling hypertension, maintaining weight, and diabetes can decrease their risk of (CAD). Dietary changes are made to reduce saturated fats of daily food intake. Reduce Cholesterol intake.

Medication may be given to reduce cholesterol levels. Low dose aspirin and anticoagulants are used to prevent the formation of a thrombus.

Education is an important nursing intervention, promotes understanding of the valvular disorder, health maintenance, prevention of complications, and early recognition of symptoms, so medical care can be sought. For older adult patients, it is important to include caregivers or family members in teaching sessions to assist with understanding of the information being taught. Teaching is provided for medications the patient is taking. If the patient is on anticoagulants for atrial fibrillation or mechanical valve replacement, a Medic Alert identification should be used and monthly appointments to check international normalized ratio (INR) values should be kept. <sup>(6)</sup>

Managing a chronic illness is a time consuming and complex process. Yet, often it is chronically ill patients themselves who are called on to manage the broad array of factors that contribute to their health. Individuals with CAD, for example, provide close to 95 percent of their own care. Common sense suggests and health care



experts agree that the chronically ill should receive support to help them manage their illnesses as effectively as possible.

Programs that provide this support so called (self-management support) have been developed in recognition that treating chronic illness requires a new model of care. In 2003, the Institute of Medicine defined self-management support as the systematic provision of education and supportive interventions by health care staff to increase patients' skills and confidence in managing their health problems, including regular assessment of progress and problems, goal setting, and problem-solving support. Self-management support programs are expected to reduce costly health crises and improve health outcomes for chronically ill patients with conditions such as CAD. Self-management support programs assume a complex sequence of effects. Developers expect these programs to change patients' behavior by increasing the patients' self-efficacy and knowledge. Improved behavior is expected to lead to better disease control which should, in turn, lead to better patient outcomes and reduced utilization of health care services, particularly preventable emergency room visits and hospitalizations, and ultimately to reduced costs .This sequence of assumptions gives self-management support programs multiple objectives and multiple endpoints for evaluation. The pivotal objective, however, is to change people's behavior<sup>(5)(8)</sup>

## **Rational:**

Cardiovascular diseases remain main cause of death in advanced countries and also contribute significantly to morbidity .The most prevalent type of cardiovascular disease is coronary artery disease. According to the latest WHO data published in April 2011 coronary heart disease deaths in Sudan ranged from 39.326 to 10.67% of total deaths. For this reason it is important for nurses to become familiar with this type of cardiac problems and the methods for perverting and treating theses disorders. Many factors leading to coronary artery diseases can be controlled or modified. Education is important in preventing and treating occlusive coronary artery diseases. Care of the patient is directed at teaching and working with the patient to change or modify risk factors. Teaching the patient how to control risk factors and manage symptoms is the major focus of nursing care for the patient with coronary artery diseases.

People often wait 2 to 24 hours before seeking medical care, yet the first hour after symptom onset is crucial for seeking the newer reperfusion treatments that restore blood flow, minimize tissue damage, and save lives. Self-management support programs assume a complex sequence of effects. Developers expect these programs to change patients' behavior by increasing the patients' self-efficacy and knowledge. Improved behavior is expected to lead to better disease control which should, in turn, lead to better patient outcomes, and ultimately to reduced costs.

## **Research objectives:**

### **General objective:**

- To design and evaluate Impact of an educational program for nurses about nursing care of patients with coronary artery diseases on nurses performance.

### **Specific objectives:**

- To assess nurses knowledge and practice about coronary artery diseases (CAD).
- To assess nurses knowledge and practice about self care of patients with CAD (nutrition, exercise ...).
- To design an educational program about improved nursing care of patients with CAD.
- To apply the educational program for nurses about education care of patients with CAD.
- To evaluate the effectiveness of this educational program on nurses knowledge and practice after implementation.

## **Literature review:**

Coronary artery disease (CAD) is the most prevalent type of cardiovascular disease. For this reason, it is important for nurses to become familiar with the various types of coronary artery conditions and the methods for assessing, preventing, and treating these disorders medically and surgically. Coronary artery disease is a term applied to obstructed blood flow through the coronary arteries to the heart muscle. <sup>(1)</sup>

## **Previous studies:**

Atherosclerosis, which is an abnormal accumulation of lipid, or fatty, substances and fibrous tissue in the vessel wall. These substances create blockages or narrow the vessel in a way that reduces blood flow to the myocardium. Studies (Mehta et al., 1998) indicate that atherosclerosis involves a repetitious inflammatory response to artery wall injury and an alteration in the biophysical and biochemical properties of the arterial walls. An association between an infection and the later development of heart disease is being explored, as is the administration of antibiotics to prevent heart disease <sup>(1)</sup>

In a research carried about assessment of knowledge and awareness of risk factors of coronary heart diseases is an essential component of behavior change and life style habits, however there is little information on rural Australian knowledge and awareness of coronary heart diseases.<sup>(9)</sup>

On study about perform education program Nurses can play a major role in educating both the public and other health care provider about the very real danger of coronary heart diseases. Effective primary prevention requires early detection of risk factors may motivate them to initiate and maintain healthy behavior. <sup>(10)</sup>

## **Coronary artery disease (CAD):**

The primary cause of coronary artery disease is atherosclerosis if blood flow reduction resulting foal (CAD) is severe and prolonged a myocardial infraction (heart attack) can occur, causing irreversible damage. (CAD) is a disease characterized by the accumulation of plaque within the layers of the coronary arteries. The plaques progressively enlarge, thicken, and calcify, causing a critical narrowing (75% occlusion) of the coronary artery lumen, resulting in a decrease in coronary blood flow and an inadequate supply of oxygen to the heart muscle. <sup>(10)(11)</sup>

Since coronary arteries deliver blood to the heart muscle, any coronary artery disorder or disease can have serious implications by reducing the flow of oxygen and nutrients to the heart, which may lead to a heart attack and possibly death. <sup>(12)</sup>

### **Types of CAD:-**

- (1) Angina pectoris.
- (2) myocardial infarction (MI).

Angina pectoris is a clinical syndrome usually characterized by episodes or paroxysms of pain or pressure in the anterior chest. The cause is usually insufficient coronary blood flow. The insufficient flow results in a decreased oxygen supply to meet an increased myocardial demand for oxygen in response to physical exertion or emotional stress. In other words, the need for oxygen exceeds the supply. The severity of angina is based on the precipitating activity and its effect on the activities of daily living. <sup>(13)</sup>

A myocardial infarction (MI), commonly known as a heart attack, results in the death of heart muscle. An MI occurs from a partial or complete blockage of a

coronary artery, which decreases the blood supply to the cells of the heart supplied by the blocked coronary artery. The extent of the cardiac damage varies depending on the location and amount of blockage in the coronary artery. This is a potentially devastating condition. The ability of the heart to contract, relax, and propel blood throughout the body requires healthy cardiac muscle. When the patient has an MI, part of the heart muscle no longer functions as it should. Cardiac conduction, blood flow, and function can be dramatically altered by an MI.

Those with MIS are typically men over 40 with atherosclerosis development. Although MIS can occur at any age in men or women, women who smoke and use oral contraceptives are at greater risk for MI. <sup>(2)</sup> <sup>(14)</sup>

### **Several factors are associated with typical anginal pain:**

Physical exertion, which can precipitate an attack by increasing myocardial oxygen demand , Exposure to cold, which can cause vasoconstriction and an elevated blood pressure, with increased oxygen demand , Eating a heavy meal, which increases the blood flow to the mesenteric area for digestion, thereby reducing the blood supply available to the heart muscle (In a severely compromised heart, shunting of blood for digestion can be sufficient to induce anginal pain.) , Stress or any emotion-provoking situation, causing the release of adrenaline and increasing blood pressure, which may accelerate the heart rate and increase the myocardial workload. <sup>(1)</sup> <sup>(12)</sup>

Myocardial infarction does not happen immediately. Ischemic injury evolves over several hours before complete necrosis and infarction take place. The ischemic process affects the sub endocardial layer, which is most sensitive to hypoxia.

This process leads to depressed myocardial contractility the body's attempt to compensate for decreased cardiac function triggers the sympathetic nervous system

to increase heart rate. The change in heart rate increases myocardial oxygen demand, further depressing the myocardium. Prolonged ischemia can produce severe cellular damage and necrosis of cardiac muscle. Once necrosis takes place, the contractile function of the muscle is permanently lost.

The heart has a zone of ischemia and injury around the necrotic area. The zone of injury is next to the necrotic area and is susceptible to becoming necrosed. If treatment is initiated within the first hour of symptoms of the MI, the area of damage can be minimized. Around the injury zone is an area of ischemia and viable tissue.

If the heart responds to treatment, this area can rebuild and maintain collateral circulation. If prolonged ischemia takes place, the size of the infarction can be quite large. The size of the infarction depends on how quickly the blood supply from the blocked artery can be restored. <sup>(1)(2)</sup>

The area that is affected by an MI depends on the coronary artery involved and the extent of occlusive coronary disease. Being familiar with the anatomy of the heart and the area of the MI helps the nurse anticipate dysrhythmias, conduction disturbances, and heart failure, which are the major complications of MIs

The anterior interventricular branch of the left coronary artery is the area that feeds the anterior wall of the heart, which also includes most of the left ventricle. An occlusion in this area causes an anterior wall MI. When the left ventricle is affected, there can be severe loss of left ventricular function, leading to severe changes in the hemodynamic status of the patient.

The right coronary artery (RCA) feeds the inferior wall and parts of the atrioventricular node and the sinoatrial node. An occlusion of the RCA leads to an inferior MI and abnormalities in impulse formation and conduction. Serious dysrhythmias can occur early in an inferior MI that may be life threatening.

The left circumflex coronary artery feeds the lateral wall of the heart and part of the posterior wall of the heart. A lesion in the circumflex leads to a lateral wall infarction of the left ventricle. The area of infarction takes time to develop. As the cells are deprived of oxygen, ischemia develops, cellular injury occurs, and over time, the lack of oxygen results in infarction, or the death of cells. <sup>(15)(16)</sup>

### **Clinical manifestation:**

Anginal pain manifests itself in several ways. Patients often describe the pain as a heaviness, tightness, or viselike or crushing pain in the center of the chest. The pain can radiate down one or both arms, with the left arm being more common, into the shoulder, neck, jaw, or back. Patients may also describe a heaviness in their arms or a feeling of impending doom. During the episode of pain, the patient may be pale, diaphoretic, or dyspneic. The pain is usually brought on by exertion and subsides with rest.

It can be relieved with a vasodilator medication such as nitroglycerin (NTG). Episodes of chest pain may increase in frequency and severity over time. If patients do not heed this warning to stop their activity and rest, they may be at risk for a myocardial infarction or sudden death. <sup>(2)(17)</sup>

Chest pain is a classic symptom of an MI. The pain begins suddenly and continues without relief with rest or NTG. The pain in the center of the chest is usually described as crushing, viselike, or as if an elephant is standing on the chest. The pain may radiate to the back, one or both arms and shoulders, neck, or jaw. The pain can imitate indigestion or a gallbladder attack with abdominal pain and vomiting.

Other classic MI symptoms include shortness of breath, dizziness, nausea, and sweating when listening to lung sounds, crackles or wheezing may be heard.



The pulse may be rapid or irregular. The presence of an extra heart sound can mean ventricular failure is imminent. Women may not experience the classic symptoms of an MI. Research has only recently focused on understanding women and cardiac disease.

Atypical symptoms reported by women may include extreme fatigue, epigastric pain, shortness of breath, or cramping in the chest. Women also often do not associate their symptoms with a heart attack because they believe it is a male disease. Myocardial infarction does not happen immediately. Ischemic injury evolves over several hours before complete necrosis and infarction take place.

The ischemic process affects the subendocardial layer, which is most sensitive to hypoxia. This process leads to depressed myocardial contraction. • Heart rate >100 (tachycardia) because of sympathetic stimulation, pain, or low cardiac output  
Variable blood pressure, Anxiety , Restlessness, Feeling of impending doom, Pale, cool, clammy skin; sweating (diaphoresis) Sudden death due to arrhythmia usually occurs within first hour <sup>(4) (5) (18)</sup>

## **Etiology:**

The most widely accepted cause of CAD is arteriosclerosis and atherosclerosis.

Arteriosclerosis is a term used to describe conditions that affect arteries and may lead to occlusive cardiovascular disease. The lining of the artery and arteriole walls become thickened and hardened and lose elasticity. Arteriosclerosis is referred to as hardening of the arteries.

Atherosclerosis, a type of arteriosclerosis, is the formation of plaque within the arterial wall, causing to narrow or become blocked is the most common cause of heart diseases, Arteriosclerosis and atherosclerosis are conditions that develop over along period (beginning in early childhood), usually occur together. <sup>(1) (2) (17)</sup>

Atherosclerosis affects the inner lining of the artery. The first step in the development of atherosclerosis is injury to the endothelial cells that line the walls of the arteries. This injury causes inflammation and immune reactions. Lipids, platelets, and other clotting factors accumulate. Scar tissue replaces some of the arterial wall.

An early indication of injury is a fatty streak on the lining of the artery. This buildup of fatty deposits is known as plaque. Plaque has irregular, jagged edges that allow blood cells and other material to adhere to the wall of the artery.

Over time this buildup becomes calcified and hardened (arteriosclerotic), causing turbulence that damages cells and increases the buildup within the vessel. As the vessel becomes stenosed (narrowed), partial or total occlusion of the artery may occur, resulting in reduced blood flow. The area distal to the occlusion may become ischemic as a result. <sup>(2) (19) (20)</sup>

Other etiologic factors include coronary artery spasm, coronary artery embolism, infectious diseases causing arterial inflammation, hypoxia, and severe exertion or stress on the heart in the presence of significant CAD (ie, surgical procedures or shoveling snow), Aortic stenosis, cardiomyopathy, or uncontrolled hypertension. Noncardiac causes include anemia, fever, and thyrotoxicosis. <sup>(17)</sup>

### **Risk Factors That non modifiable:**

Overall, coronary artery disease is slightly more common in men than in women: in the United States, 9.1% of men and 7.0% of women have the disease. Women tend to develop symptomatic coronary artery disease about 10 years later than men. In the United States, men over 40 years of age have a 49% chance of developing the disease in their lifetime, while the chance for women over the age of 40 years is 32%. It is thought that the higher estrogen levels in premenopausal women protect them from some of the heart damage done by atherosclerosis, but this

protection disappears after menopause <sup>(21)</sup>

Men have more risk factors and higher incidence of CAD. Males have a higher incidence of heart disease at an earlier age. This is the predominant reason that there are four times as many women over the age of 80 than men. However, after the onset of menopause, the incidence of cardiovascular disease in women more closely approximates that of men. Generally, this means that women tend to develop problems with heart disease 10 years later than men.

As more women enter the work force and assume the lifestyle habits of their counterparts (increased smoking, stressful work place, etc.), the incidence of heart disease in younger women has increased. <sup>(21)</sup>

The fact that menopause coincides with when women begin to catch up to men in the area of incidence of heart disease has led to a great deal of research. This has led to much research on the effect of estrogen replacement (hormonal) therapy and heart disease. It is certainly worth discussing the pros and cons with your doctors. Age Men have increased incidence after age 50. Women have increased incidence after menopause. We certainly can't change heredity. We have no control over who brought us into this world. But we certainly need to realize that if our parents had heart disease at an early age, we are much more likely to develop coronary artery disease. We also have to realize that families pass on more than genes. A recent study indicated that people with a family history of coronary artery disease have two times the risk of having a significant elevation in cholesterol. The types of food, exercise habits, and exposure to smoking also run in families. But it does not mean that we just sit back and do nothing. If we have heart disease in our family we need to do everything to reduce our other risk factors - we should eat right, exercise, don't smoke, control our blood pressure and diabetes, and decrease stress levels. Heredity CAD risk factors can run in families. Ethnicity African-Americans have a higher

incidence of atherosclerosis. <sup>(21)</sup>

African Americans have a higher prevalence of, and a higher death rate from, coronary artery disease than European Americans. In part, the difference results from the higher incidence of hypertension, obesity, metabolic syndrome, and low physical activity among African Americans. This racial disparity is also thought to result from the fact that African Americans, on average, tend to seek treatment later than European Americans and are less likely to receive invasive treatment. Higher incidence of heart disease in African Americans than in Caucasians. Americans of Asian Indian origin are 2 to 3 times as likely as European Americans to develop coronary artery disease. On the other hand, coronary artery disease is less common in Hispanic and Latino Americans, as well as in Asian Americans not of Indian origin, than in European Americans. <sup>(21)</sup>

Even though the risk of heart disease increases with age, it does not mean you can't do anything about it. A change in lifestyle with modification of risk factors has been shown in many studies to be helpful at any age. In fact, one study suggested that discontinuing smoking after age 60 may add 5-7 years to our life. <sup>(22)</sup>

### **Risk Factors that modified:-**

Smoking Causes vasoconstriction and increases myocardial oxygen demand. Decreases HDL. Hypertension Vasoconstriction increases myocardial oxygen demand. Elevated serum Level above 240 mg/dL increases the risk of cholesterol developing CAD. Diabetes Increases the risk of hypertension, obesity, and elevated blood lipids . Obesity Increases heart workload and risk of hypertension, diabetes, glucose intolerance, and hyperlipidemia. Physical inactivity. Stress Increases heart workload and risk for hypertension. Foods that contain folic homocysteine acid (fruits, green leafy vegetables) reduce homocysteine levels. Sedentary lifestyle Increases obesity, hypertension, hyperlipidemia. <sup>(12)(14)(23).</sup>

In May 2001 the National Heart, Lung, and Blood Institute released therapeutic lifestyle changes (TLC) that are recommended to help control CHD risk factors. The TLC diet is low in cholesterol and saturated fats, soluble fiber, and plant are also recommended to reduce LDL levels. <sup>(6)</sup>

## **Management of CAD:**

### **Vasodilators:**

Nitroglycerin (NTG) a nitrate is the drug of choice for acute anginal attacks. NTG can be administered sublingually, orally, transdermally, intravenously, or as a lingual spray. When administered sublingually, NTG may relieve chest pain within 1 to 2 minutes Long-acting nitrates can be given orally, by ointment, or by transdermal patches. Nitrates all act to maintain coronary artery vasodilation. Isosorbide dinitrate (Isordil) and isosorbide mononitrate (ISMO) are examples of long-acting nitrates. A problem with long-acting nitrates is the develop.

NTG sublingually, topically, or by intravenous (IV) drip can be administered for vasodilation to supply more blood to the myocardium to reduce pain and the workload of the heart. In the acute phase the IV route is usually used. . <sup>(5) (12) (26)</sup>

Nursing Implications include Monitor blood pressure and heart rate before and after giving. Caution patient to rise slowly because of orthostatic hypotension, especially with sublingual nitroglycerin. Take up to three nitroglycerin tablets at 5-minute intervals. If pain is not relieved, call a doctor or emergency medical assistance immediately. Do not remove tablets from bottle.

Vasodilators become inactive when exposed to heat, air, light, and moisture. Tell patient a burning or tingling sensation may be felt under the tongue with sublingual nitroglycerin. To prevent tolerance, the patch or ointment is usually removed at bedtime and reapplied in the morning, giving the patient an 8- to 12-hour

nitrate-free period. <sup>(2)</sup><sup>(12)</sup>

### **Self-Administration of Nitroglycerin:**

Most patients with angina pectoris must self-administer nitroglycerin on an as-needed basis. A key nursing role in such cases is educating patients about the medication and how to take it. Sublingual nitroglycerin comes in tablet and spray forms.

### **Teaching about Sublingual Nitroglycerin:**

Nitroglycerin is available as two types of products that are used for different reasons. The extended-release capsules are used every day on a specific schedule to prevent angina attacks. sublingual tablets work quickly to stop an angina attack that has already started or they can be used to prevent angina if you plan to exercise or expect a stressful event

Nitroglycerin sublingual tablets should not be chewed, crushed, or swallowed. They work much faster when absorbed through the lining of the mouth. Place the tablet under the tongue or between the cheek and gum, and let it dissolve. Do not eat, drink, smoke, or use chewing tobacco while a tablet is dissolving <sup>(29)</sup>

Instruct the patient to make sure the mouth is moist, the tongue is still, and saliva is not swallowed until the nitroglycerin tablet dissolves ,If the pain is severe, the patient can crush the tablet between the teeth to hasten sublingual absorption, Advise the patient to carry the medication at all times as a precaution. However, because nitroglycerin is very unstable, it should be carried securely in its original container (eg, capped dark glass bottle); tablets should never be removed and stored in metal or plastic pillboxes, Explain that nitroglycerin is volatile and is inactivated by heat, moisture, air, light, and time. Instruct the patient to renew the nitroglycerin supply every 6 months, Inform the patient that the medication should be taken in

anticipation of any activity that may produce pain. Because nitroglycerin increases tolerance for exercise and stress when taken prophylactically (ie, before angina - producing activity, such as exercise, stair-climbing,), it is best taken before pain develops, Recommend that the patient note how long it takes for the nitroglycerin to relieve the discomfort. Advise the patient that if pain persists after taking three sublingual tablets at 5-minute intervals, emergency medical services should be called, Discuss possible side effects of nitroglycerin, including flushing, throbbing headache, hypotension, and tachycardia. <sup>(1)</sup>

### **Oral spray:**

Remove the plastic cap, Do not shake the container, If this is a new bottle or container, prime the pump before use by releasing a test spray. This must be done 5 or 10 times into the air away from your face and other people, If this is an old bottle and you have not used it for more than 6 weeks, you must prime it again with 1 or 2 test sprays, Hold the container upright with your forefinger on top of the grooved button. Open your mouth and bring the container as close to it as possible, Press the button firmly with the forefinger to release the spray 1 or 2 times onto or under the tongue. Do not inhale or breathe in the spray, Release the button and close your mouth, but do not swallow right away. Do not spit out the spray or rinse your mouth for at least 5 to 10 minutes, If you need a third spray, you must wait 5 minutes after the second spray. Use exactly the same steps you used for the first spray. No more than 3 sprays should be given within 15 minutes, Replace the cover after using the medicine, Always place the spray bottle in an upright position if not in use. Also, check the fluid level of Nitromist container regularly. If the fluid reaches the top or middle of the hole on the side of container, this is an indicator that you must get a refill, Do not use the spray near heat, an open flame, or while smoking <sup>(29)</sup>

## **Teaching about Topical Nitroglycerin:**

Nitroglycerin is also available in a lanolin-petrolatum base that is applied to the skin as a paste or a patch. Patients who use topical nitroglycerin need additional instruction , Advise the patient to read the instructions that accompany the product, because instructions vary according to the preparation , Also remind the patient to rotate the site of application to avoid skin irritation , Explain that the area of application needs to be an area that is well perfused for absorption to occur. Therefore, the medication should not be applied to areas with extensive body hair or scar tissue, Recommend that the patient protect clothing from the oil base in the paste, Explain that a long-term equally spaced dosing schedule of application of topical nitroglycerin is generally avoided to prevent tolerance (when the body does not respond as well to the same amount of medication). Most physicians prescribe application of topical nitroglycerin paste three or four times daily or every 6 hours (excluding the mid-night dose), and application of the nitroglycerin patch every morning and removed at 10 PM. This dosing regimen allows for a 6- to 8-hour nitrate-free period to prevent the body's development of tolerance <sup>(1)</sup> <sup>(30)</sup>

Analgesics are given for relief of chest pain. Morphine sulfate is the most commonly used narcotic for several reasons. In addition to pain relief, it helps decrease anxiety, opens bronchioles, and reduces preload and after load, which can help increase blood supply and oxygen to the myocardium. It is given intravenously in small doses that are titrated to meet the patient's pain relief needs.<sup>(5)</sup> <sup>(31)</sup>

## **Antiplatelet and Anticoagulant medications:**

Antiplatelet medications are administered to prevent platelet aggregation, which impedes blood flow. Anticoagulant therapy is the administration of medications to achieve the following , Disrupt the blood's natural clotting mechanism when there is a risk of clotting, Prevent formation of a thrombus in immobile and/or postoperative



patients, Intercept the extension of a thrombus once it has formed. <sup>(25)(32)</sup>

Types of anticoagulants include coumarin derivatives, such as warfarin (Coumadin) given orally, heparin (Heparin) given subcutaneously or I.V., or low-molecular-weight heparin given subcutaneously.

Low-molecular-weight heparin may be given prophylactically following some orthopedic surgical procedures, such as total hip replacement and long surgical procedures in high-risk patients. Anticoagulants may be contraindicated or used with extreme caution in conditions that may lead to bleeding, in patients who may have poor follow-up, and in patients with hepatic and renal insufficiency. <sup>(1)(17)(19)</sup>

Aspirin prevents platelet activation and reduces the incidence of MI and death in patients with CAD. A 160- to 325-mg dose of aspirin should be given to the patient with angina as soon as the diagnosis is made (eg, in the emergency room or physician's office) and then continued with 81 to 325 mg daily.

Although it may be one of the most important medications in the treatment of CAD, aspirin may be overlooked because of its low cost and common use. Patients should be advised to continue aspirin even if concurrently taking nonsteroidal anti-inflammatory drugs (NSAIDs) or other analgesics. Because aspirin may cause gastrointestinal upset and bleeding, should be considered to allow continued aspirin therapy. <sup>(15)(17)(27)</sup>

Unfractionated heparin prevents the formation of new blood clots. Use of heparin alone in treating patients with unstable angina reduces the occurrence of MI. If the patient's signs and symptoms indicate a significant risk for a cardiac event, the patient is hospitalized and may be given an intravenous bolus of heparin and started on a continuous infusion or given an intravenous bolus every 4 to 6 hours. The amount of heparin administered is based on the results of the activated partial thromboplastin time (aPTT).

Because unfractionated heparin increase the risk of bleeding, the patient is monitored for signs and symptoms of external and internal bleeding, such as low blood pressure, an increased heart rate, and a decrease in serum hemoglobin and hematocrit values, The patient receiving heparin is placed on bleeding precautions, which include:

Applying pressure to the site of any needle puncture for alonger time than usual,

Avoiding intramuscular injections, Avoiding tissue injury and bruising from trauma or use of constrictive devices (eg, continuous use of an automatic blood pressure cuff) <sup>(15) (17) (27)</sup>

### **Nursing Interventions include the following:**

Weight patient before initiating therapy as unfractionated heparin dose as well as some forms of low-molecular-weight heparin are calculated based on weight, For subcutaneous administration, For I.V. administration, begin continuous infusion, Use continuous infusion pump. Assess frequently to make sure the pump is functioning properly, there are no kinks or leaks in I.V. tubing, and I.V. site is without signs or symptoms of infiltration, Double-check concentration and dose of heparin, especially when giving high dosages, Keep patient on un fractionated heparin on bed rest; however, the patient with low-molecular-weight heparin may be ambulatory, Be aware that heparin may be continued for 4 to 5 days after oral anticoagulant is initiated due to the delayed onset of therapeutic effectiveness with oral anticoagulants. <sup>(1) (15)</sup>

### **Thrombolytic therapy:**

Thrombolytic therapy is administration of thrombolytic agents to dissolve any formed thrombus and inhibit the body's hemostatic function. Thrombolytic agents are available for parenteral use only. Commonly used thrombolytics include streptokinase

(Streptase) and tissue plasminogen activator (TPA, Activase).

Thrombolytic therapy is contraindicated in conditions that may lead to bleeding and should be given only in a controlled setting, such as a cardiac catheterization laboratory or an intensive care unit (ICU). Thrombolytic therapy for deep vein or peripheral arterial thrombosis, however, may be given on step-down units or medical-surgical floors. Clinical Indications Acute myocardial infarction (MI) from coronary thrombosis. <sup>(3) (12) (17)</sup>

Thrombolytic therapy is used to dissolve a blood clot that is occluding a coronary artery. Many communities allow initiation of thrombolytic therapy by paramedics in the field. Studies have revealed a decreased incidence of mortality and morbidity and less extensive tissue damage when thrombolytic treatment is used. Thrombolytic therapy must be started within a specified time range from the onset of symptoms, usually within 1 to 6 hours, before necrosis results. Glycoprotein inhibitors (abciximab, tirofiban) may be used as an adjunct to thrombolysis or PTCA in patients with acute myocardial infarction. These drugs work by inhibiting platelet aggregation. <sup>(1) (2)</sup>

### **Contraindications to thrombolytics therapy:**

Active internal bleeding,  History of hemorrhagic stroke (any time), other stroke (less than 1 year before MI), intracranial neoplasm, or recent head trauma, Suspected aortic dissection  Major surgery or trauma less than 2 weeks before MI, Blood pressure higher than 180/110 mm Hg on two readings, Active peptic ulcer disease,  History of stroke, Known bleeding diathesis (e.g., hemophilia) or current use of anticoagulants, Prolonged or traumatic cardiopulmonary resuscitation, Diabetic hemorrhagic retinopathy,  Pregnancy, history of chronic severe hypertension <sup>(3) (25)</sup>  
(29)

**Nursing Considerations include:**

Minimize the number of times the patient's skin is punctured, Avoid intramuscular injections, Draw blood for laboratory tests when starting the IV line, Start IV lines before thrombolytic therapy; designate one line to use for blood draws, Avoid continual use of noninvasive blood pressure cuff, Monitor for acute dysrhythmias, hypotension, and allergic reaction, Monitor for reperfusion , resolution of angina or acute ST-segment changes, Check for signs and symptoms of bleeding: decrease in hematocrit and hemoglobin values, decrease in blood pressure, increase in heart rate, oozing or bulging at invasive procedure sites, back pain, muscle weakness, changes in level of consciousness, complaints of headache, Treat major bleeding by discontinuing thrombolytic therapy and any anticoagulants; apply direct pressure and notify the physician immediately, Treat minor bleeding by applying direct pressure if accessible and appropriate; continue to monitor. <sup>(5)</sup> <sup>(12)</sup>

**Oxygen Administration:**

Oxygen therapy is usually initiated at the onset of chest pain in an attempt to increase the amount of oxygen delivered to the myocardium and to decrease pain. Oxygen inhaled directly increases the amount of oxygen in the blood.

The therapeutic effectiveness of oxygen is determined by observing the rate and rhythm of respirations. Blood oxygen saturation is monitored by pulse oximetry, the normal oxygen saturation (SpO<sub>2</sub>) level is greater than 93%. Studies are being conducted to assess the use of oxygen in patients without respiratory distress and its effect on outcome. Oxygen is administered immediately, usually at 2 L per minute via nasal cannula. Arterial blood gases (ABGs) are drawn to determine the patient's oxygen needs. Oxygen can be administered via mask if higher concentrations are

needed. Mechanical ventilation can be provided when indicated by ABGS. <sup>(1)</sup> <sup>(33)</sup>.

### **Nursing management:**

Assessment of patients, the five most important factors that indicate a likelihood of ischemia due to coronary artery disease are obtained rapidly during the history. These factors include a description of the symptoms, information about a prior history of coronary artery disease, the patient's sex and age, and the number of risk factors present.

The nurse uses the N, O, P, Q, R, S, T method of pain assessment when taking the patient's history. For a review of the assessment questions determining the patient's (normal) baseline, the nurse asks about the time of (onset) of the pain. The nurse determines causes (provocative) of the pain and any measures the patient has used to relieve the pain (palliative) The (quality) of anginal pain is frequently described as deep, poorly localized chest or arm discomfort .(radiation) of the pain, patients report substernal , left sided chest , or epigastric pain that may radiate to the left arm, neck, back, or jaw. The (severity) of the pain is evaluated by asking the patient to rate the pain on a scale of 1 to 10, with 10 being the worst pain they have experienced. Additional information is obtained related to (time).Obtaining a thorough history on a patient admitted with a diagnosis of angina pectoris is important in developing a plan of care and should include the following, How long the patient has had angina, Risk factors, Triggering activities, How pain is relieved If the patient reports chest pain, areas of assessment and documentation should include the following:

Type, location, and pain radiation to other areas of the body, Vital signs and skin color and temperature, Presence of dyspnea, labored respirations, diaphoresis, or nausea Oxygen and sublingual al NTG are given to the patient with chest pain as ordered. Blood pressure and heart rate are assessed before and after NTG is given.

The nurse must promote rest and decrease anxiety for the patient with chest pain. A patient who is experiencing chest pain should never be left alone. Emotional support is important because patients and their families are often afraid that the patient may die.

The nurse gathers information about the patient's symptoms and activities, especially those that precede and precipitate attacks of angina pectoris. Other helpful questions may be asked. How long does the angina usually last, Does nitroglycerin relieve the angina, If so, how many tablets or sprays are needed to achieve relief , How long does it takes for relief to occur.<sup>(1)(11)(15)</sup>

The answers to these questions form a basis for designing a logical program of treatment and prevention. In addition to assessing angina pectoris or its equivalent, the nurse also assesses the patient's risk factors for CAD, the patient's response to angina, the patient's and family's understanding of the diagnosis, and adherence to the current treatment plan. A thorough history is obtained to identify risk factors that may contribute to a myocardial infarction. All patients admitted with chest pain are treated as having a possible MI until it has been ruled out. <sup>(12)(34)(35)</sup>

The physical examination in patients with chest pain may be unrevealing. However, a thorough examination is essential to identify important diagnostic clues if present. Cardiac assessment requires examination of all aspects of the individual, using the standard steps of inspection, palpation, percussion, and auscultation <sup>(2)(12)</sup>.

The general appearance of a patient is an important clinical observation. Patients who appear markedly uncomfortable or present with pallor, diaphoresis, or respiratory distress should be considered acutely ill.

Skin is evaluated for moistness or dryness, color, elasticity, edema, thickness, lesions, ulcerations, and vascular changes. Nail beds are examined for cyanosis and clubbing, which may indicate chronic cardiac abnormalities. General differences in

color and temperature between body parts may provide perfusion clues. <sup>(2) (12) (15)</sup>

Pulses Cardiovascular assessment continues with palpation and involves the use of the pads of the finger and balls of the hand. Using the pads of the fingers, the carotid, brachial, radial, femoral, popliteal, posterior tibial, and dorsalis pedis pulses are palpated. The peripheral pulses are compared bilaterally to determine rate, rhythm, strength, and symmetry. The 0-to-3 scale described is used to rate the strength of the pulse .The carotid pulses should never be assessed simultaneously because this can obstruct flow to the brain. <sup>(2) (36)</sup>

Vital sign and measure it in all patients with chest pain. A low measurement may suggest a pulmonary disorder or poor perfusion from a cardiac or vascular event, especially if it is decreased from the patient's baseline. <sup>(15)</sup>

Compensatory mechanisms increased filling volumes, peripheral vasoconstriction, and elevated heart rate the outcome of assessing the cardiovascular system will include the following:

Thorough observation and palpation of the pulses, as compared with the contralateral pulse and comparing pulses in the upper extremities with those in the lower extremities, Complete inspection of the veins, especially the jugular venous veins, Accurate measurement of blood pressure in both upper extremities with the patient sitting, standing, and supine, Complete inspection, palpation, percussion, and auscultation of the heart <sup>(15) (36)</sup>.

The patient and family should be included in planning care. They need to understand that the purpose of treatment is to prevent further myocardial damage. The plan of care should focus on reducing factors that contribute to an increased workload of the heart.

## **Nursing Interventions:**

If the patient reports pain (or the individual's equivalent to pain), the nurse takes immediate action. When a patient experiences angina, the nurse should direct the patient to stop all activities and sit or rest in bed in a semi-Fowler position to reduce the oxygen requirements of the ischemic myocardium. The nurse assesses the patient's angina.

A difference may indicate a worsening of the disease or a different cause. The nurse then continues to assess the patient, measuring vital signs and observing for signs of respiratory distress. a 12-lead ECG is usually obtained and scrutinized for ST-segment and T-wave changes. If the patient has been placed on cardiac monitoring with continuous ST-segment monitoring, the ST segment is assessed for changes.

Nitroglycerin is administered sublingually, and the patient's response is assessed (relief of chest pain and effect on blood pressure and heart rate).

The nurse administers oxygen therapy if the patient's respiratory rate is increased or the oxygen saturation level is decreased. although there is no documentation of its effect on outcome, oxygen is usually administered at 2 L/min by nasal cannula, even without evidence of respiratory distress. If the pain is significant and continues after these interventions, the patient is usually transferred to a higher-acuity nursing unit. <sup>(1) (2) (12) (37)</sup>

Limiting the patient to bed or chair rest during the initial phase of treatment is particularly helpful in reducing myocardial oxygen consumption . This limitation should remain until the patient is pain free and hem dynamically stable. Checking skin temperature and peripheral pulses frequently is important to ensure adequate tissue perfusion. Oxygen may be administered to enrich the supply of circulating oxygen. <sup>(4) (5)</sup>

Regular and careful assessment of respiratory function can help the nurse



detect early signs of pulmonary complications. Scrupulous attention to fluid volume status prevents overloading the heart and lungs. Encouraging the patient to breathe deeply and change position frequently helps keep fluid from pooling in the bases of the lungs.

A vague uneasy feeling of discomfort or dread accompanied by an autonomic response; the source is often nonspecific or unknown to the individual, a feeling of apprehension caused by anticipation of danger. It is an alerting signal that warns of impending danger and enables the individual to take measures to deal with threat. Patients with angina often fear loss of their roles within society and the family. They may also be fearful 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. <sup>(18)</sup>

Anxiety is experienced at varying levels. The level of anxiety impacts the interventions selected. It is important for the nurse to assess anxiety level before selecting nursing interventions.

Low: Adaptive and can motivate for normal activities of life.

Mild: Prepares the person for action by sharpening the senses, increasing the perceptual field, alertness, and awareness. This level enhances learning and usually is not perceived as stressful.

Moderate: Reduction of perceptual field, reduced alertness to environment. Learning can occur at a reduced level with decreased attention span and ability to concentrate.

Severe: Perceptual field greatly diminished, focus on details or fixation on a single detail. Very limited attention span and great difficulty with concentration or

problem- solving. Focus is on the self and desire to decrease anxiety. <sup>(3) (5)</sup>

Health is much more than just the absence of disease. Have you ever known someone with what appears to be a small health problem who considers himself unwell or disabled, many things play a role in a person's perception of health. One is the ability to function or perform desired or necessary tasks such as activities of daily living (ADL).

The goal of nursing care can best be defined as helping patients achieve their highest possible level of wellness. To do this, consider the patient's strengths, assets, and resources, as well as weaknesses, liabilities, and disabilities.

Encourage the patient to take a personal inventory and recognize what is required to attain wellness. Working together, the patient, family, and members of the health-care team set wellness goals and develop a plan of action that will help meet those goals <sup>(35)(36)</sup>

Nurses must have a good knowledge base in order to safely care for their patients. You could not drive a car without first learning the basics of how a car works and how to follow the rules of the road. In the same way, you must understand the human body in health and illness before you can understand how to take care of an ill patient.

The best knowledge upon which to base your practice comes from research. Nurse researchers try new methods for taking care of patients and compare them with traditional methods to determine what works best <sup>(36)</sup>

Nurses can play a role in prevention of this disease by being knowledgeable of the risk factors associated with the disease. This course will acquaint the nurse with the risk factors, particularly the modifiable ones, so that the nurse may be a teacher motivator for the client. Specific tools for assessment and strategies for success will

be emphasized.

The American Heart Association plays a major role in research and education for this disease. A consensus panel has strongly urged that a multidisciplinary approach including physician, nurse and dietitian - manage the risk therapy program. The panel has found compelling scientific evidence demonstrating that risk factor interventions will extend life, improve quality of life, decrease the need for surgical procedures, and reduce the incidence of myocardial infarction. <sup>(38)</sup>

### **Client Education:**

Client education is an integral part of nursing care. It is the nurse's responsibility to assist the client to identify the learning needs and resources that will restore and maintain an optimal level of functioning. Client education is extremely important today in a health care environment that demands cost effective measures. With shorter hospital stays, clients are being discharged to the home or other health care settings in more critical condition than ever before. Client education, a hallmark of quality nursing care, is a fiscally responsible intervention that encourages health care consumers to engage in self-care and to develop healthy lifestyle practices. <sup>(4)</sup>

The nurse as a teacher is challenged, not only to provide specific patient and family education, but also to focus on the educational needs of communities. Health education is important to nursing care, because it can determine how well individuals and families are able to perform behaviors conducive to optimal self-care. Teaching, as a function of nursing, is included in all state nurse practice acts and in the standards of clinical nursing practice of the American Nurses Association (ANA, 1998).

Health education is an independent function of nursing practice and is a primary responsibility of the nursing profession. All nursing care is directed toward

promoting, maintaining, and restoring health preventing illness and assisting people to adapt to the residual effects of illness. Many of these nursing activities are accomplished through health education or patient teaching. People with chronic illnesses are among those most in need of health education. As the life span of our population continues to increase, the number of people with such illnesses will also increase.

People with chronic illness need health care information to participate actively in and assume responsibility for much of their own care. Health education can help these individuals to adapt to illness, prevent complications, carry out prescribed therapy, and solve problems when confronted with new situations. It can also prevent crisis situations and reduce the potential for re hospitalization resulting from inadequate information about self care.

The goal of health education is to teach people to live life to its healthiest that is, to strive toward achieving their maximum health potential. In addition to the public's right to and desire for health education, patient education is also a strategy for reducing health care costs by preventing illness, avoiding expensive medical treatments, decreasing lengthy hospital stays, and facilitating earlier discharge.

For health care agencies, offering community wellness programs is a public relations tool for increasing patient satisfaction and for developing a positive image of the institution. Patient education is also a cost avoidance strategy for those who believe that positive staff patient relationships avert malpractice suits. <sup>(39)</sup>

Chronic illness management is a collaborative process between patient, family, nurse, and other health care professionals. Collaboration is not limited to hospital settings, rather, it is important in all settings and throughout the illness trajectory. Keeping an illness stable over time requires careful and continued monitoring of symptoms and attention to management regimens. Detecting problems early and

assisting patients to develop appropriate management strategies can make a significant difference in outcomes.

Patient and family teaching is one of the most significant aspects of nursing care and may make the difference in the ability of patients and their families to adapt to chronic health conditions. Well informed, educated patients are more likely than uninformed patients to be concerned about their health and do what is necessary to maintain it. <sup>(21)</sup>

### **Education process:**

The education process is a planned interaction that promotes behavioral change that is not a result of maturation or coincidence. Teaching is an active process in which one individual shares information with others to provide them with the information to make behavioral changes. Teaching refers to all the activities used by a teacher to assist the learner to absorb new information; it consists of activities that promote change. Teaching is a goal directed process that provides the opportunity for learning. Learning is the process of assimilating information with a resultant change in behavior. Nurses and clients have shared responsibilities in the teaching learning process. Knowledge is power. By sharing knowledge with clients, the nurse empowers clients to achieve their maximum level of wellness. The teaching process will be familiar to nurses in that it mirrors the steps of the nursing process: assessment, identification of learning needs (nursing diagnosis), planning, implementation of teaching strategies, and evaluation of learner progress and teaching efficacy. Through teaching, the nurse empowers clients in their self care abilities. Teaching is the tool for providing information to clients about specific disease processes, treatment methods, and health promoting behaviors <sup>(4) (35)</sup>

### **Purposes of Client teaching:**

The goal of health education is to help individuals achieve optimum states of health through their own actions. Teaching, one of the most important nursing functions, addresses clients' need for information. Often, knowledge deficit about the course of illness and/or self-care practices hinders a client's recovering from illness or engaging in health promotion behaviors. The nurse's charge is to help bridge the gap between what a client knows and what a client needs to know in order to achieve optimum health. Client teaching is done for a variety of reasons, including:

Promotion of wellness, Prevention of disease/injury, Restoration of health  
Facilitation of coping abilities. Client education focuses on the client's ability to practice healthy behaviors. The client's ability to care for self is enhanced by effective education. Many will agree that patients need assistance with understanding their health situations, making health care decisions, and changing health behaviors. Patient and family education has become an integral part of safe, cost-effective, quality patient care. <sup>(4)</sup>

### **Barriers to Learning:**

Receiving information does not, in and of itself, guarantee that learning will occur. Several barriers can impede the learning process. In a nursing situation, learning barriers can be classified as either internal (psychological or physiological) or external (environmental or sociocultural). Examples of these barriers are shown in the accompanying display. The nurse must assess for the presence of barriers to facilitate the learning process <sup>(4) (40)</sup>

### **Strategies for Effective Patient Education:**

The goal of health promotion is to encourage individuals to take responsibility to improve their health. A high level of wellness can be achieved by all ages, the

chronically ill, and the disabled, as well as everyone else. The nurse needs to keep this in mind as she develops the most effective strategy for her area-based client population.

The public is increasingly more aware of health promotion as seen in the media, schools and community programs. This should have a positive effect on individuals taking charge of their own health. Unfortunately, even with all the information, this is not true for many. The nurse is continually challenged by persons difficult to motivate to achieve goals mutually set. The client, too, is challenged by the different, and sometimes conflicting, information from the media. The news will often include a report of a study just completed that refutes information reported earlier. Studies on the effect of cholesterol and sodium in the diet are often conflicting. Sometimes these reports are from a small study and have not been reviewed by other experts or the American Heart Association. The damage may already be done as the client believes the news report. The nurse will need to keep aware of the new reports and help the client with sorting through this information as it affects him. Although client education is the best place to start, simply providing information is not the only solution. The education you provide must also include strategies for motivation and materials the client may use at home. Today, nurses have access to video materials, excellent written materials, and information about community-based programs. With these resources, the nurse may plan accordingly. Utilizing the nursing process, the framework will include: assessment of need for education, assessment of readiness, planning and developing an individualized program, implementation of the program; and documentation and evaluation of the patient education. Probably the assessment of readiness is the most difficult for the nurse. All the great programs in the world will not be effective if the patient is not ready to learn <sup>(21) (38)</sup>

## **Guidelines for teaching patient:**

Make sure the client is comfortable. Pain, fatigue, and hunger can impair learning, Assess client's learning readiness and motivation, also assess developmental level. Do not equate age with developmental level, Assess client's psychological status. Depression, severe anxiety, and denial interfere with learning, Determine client's self care abilities. Are there any variables (eg, hearing or visual impairment, cognitive issues, and literacy issues) that will affect the choice of teaching strategy or approach, Use terms that are easily understood by the client. Avoid talking down to the client; a condescending, paternalistic manner impedes learning, Determine the time of day in which the client is better able to concentrate, Assess for perceptual impairments and individualize teaching strategies accordingly. Because client education is a standard and essential component of nursing practice, teaching interventions and the client's response must be documented. Elements for documenting client education in all practice settings include:

Content taught, Teaching methods used, who was taught (e.g., client, which family member, other caretaker), Client, family response to teaching activities.

(4)

## **Implementation of teaching:**

Put the teaching plan into action, Use language the person can understand.

Use appropriate teaching aids and provide Internet resources if appropriate,

Use the same equipment that the person will use after discharge, Encourage the person to participate actively in learning, Record the learner's responses to the teaching actions, Provide feedback. <sup>(41)</sup>



### **Educational Domains:**

Nursing as a discipline includes three domains of learning affective, psychomotor, and cognitive. The affective domain is concerned with attitudes, values, and the development of appreciations. An example of nursing care in the affective domain is the nurse quietly accepting a patient's statement that there is no God without the nurse imposing personal beliefs on the patient. The psychomotor domain is concerned with manipulative or motor skills related to procedures or physical interventions. An example of nursing care in the psychomotor domain is the nurse administering an intramuscular injection to a patient. The cognitive domain is

concerned with recall, recognition of knowledge, comprehension, and the development and application of intellectual skills and abilities. An example of nursing care in the cognitive domain is the nurse clustering collected information and determining its significance. When discussing the application of critical thinking to test taking, the focus will be on the cognitive domain. The purpose of teaching patients is to ensure that they have the knowledge and Authority (empower) to respond most effectively to their own situation. Learners bring their own lifetimes of learning to the learning situation. The Nurse needs to customize each teaching plan, capitalize on the patient's previous experience and knowledge, and identify what the patient still needs to know before teaching can begin <sup>(24) (37) (42)</sup>

### **Teaching Patients Self Care:**

In the field of medicine and health care, self-management means the interventions, training, and skills by which patients with a chronic condition, disability, or disease can effectively take care of themselves and learn how to do so. Personal care applied to outpatients Self care is essential for lifelong success in reducing cardiovascular risk and managing chronic conditions such as diabetes and heart failure. Self care has been defined as a naturalistic decision making approach that patients use in the choice of behaviors that maintain physiological stability (symptom monitoring and treatment adherence) and the response to symptoms when they occur. Unlike adherence, self care involves the tactical and situational skills for managing various disease conditions. Acquisition of skills to modify behaviors is often gained through involvement and support from family members and friends and practice over time. However, nurses can assist individuals in acquiring skills to perform routine behaviors such as meal preparation and can teach them how to order various diets in restaurants to master changes in their diet

Learning about the modifiable risk factors that contribute to the continued

development of CAD and resulting angina is essential. Exploring with the patient and family what they see as their priority in managing the disease and developing a plan based on their priorities can assist with patient adherence to the therapeutic regimen. It is important to explore with the patient methods to avoid, modify, or adapt the triggers for anginal pain. The teaching program for the patient with angina is designed so that the patient and family can explain the illness, identify the symptoms of myocardial ischemia, state the actions to take when symptoms develop, and discuss methods to prevent chest pain and the advancement of CAD.

The goals of the educational program are to reduce the frequency and severity of anginal attacks, to delay the progress of the underlying disease, if possible, and to prevent any complications. <sup>(37)(43)(45)</sup>

### **Living with coronary artery disease:**

You can make lifestyle changes that will help you to manage coronary artery disease or reduce your risk these changes include:-

Don't smoke nicotine raise your blood pressure because it causes your body to release adrenaline, which makes your blood vessels constrict and your heart beat faster. If you smoke ask doctor to help you make a plan to quit. After 2to 3 years of not smoking, you risk of CHD will be as low as the risk of a person who never smoked, Control your blood pressure. If you are taking medicine for high blood pressure, be sure to take it just the way your doctor tells you to, Exercise regular exercise can make your heart stronger and reduce your risk of heart disease. Exercise can also help if you have high blood pressure. Try to exercise at least 4to 6 times a week for at least 30 minutes each time, Ask your doctor about taking a low dose of aspirin each day. Aspirin helps prevent CHD but taking it also has some risks, Ask your doctor about taking vitamin supplements. Some studies have shown that

vitamin E may lower a person's risk of having a heart attack. Other vitamins may also help protect against CHD, Eat a healthy diet. Add foods to your diet that are low in cholesterol and saturated fats, because your body turns saturated fats into cholesterol, Managing your weight never smoked, Regularly taking medications to control blood pressure and/or diabetes , Avoiding or restricting alcohol consumption, Reduce stress <sup>(4)</sup>

### **Lifestyle changes and Cardiac Care:**

To reduce risk factors or promote recovery from cardiovascular disease, lifestyle changes are often needed. Longstanding habits are difficult to change. Support groups can offer encouragement that is helpful in promoting a healthy lifestyle. Patients should be referred to community support groups as needed. (3).

For patients with coronary artery disease, lifestyle changes will improve their quality of life and their sense of well being as well as slowing or even reversing their illness. Reducing dietary calories and fats (especially saturated fats) and increasing exercise can significantly reduce one's risk of developing diabetes and atherosclerotic cardiovascular disease. Therapeutic lifestyle changes are also the cornerstones of the treatment of obesity, hypertension, insulin resistance, and most dyslipidemias. Lifestyle changes are difficult to maintain, and they require that patients truly believe that the results are worth the effort. <sup>(36)</sup>

### **Motivation for Lifestyle Changes:**

Hans Selye, known as the father of stress, once stated that if you can laugh fifteen times a day it will relieve stress. Having a positive outlook and a good sense of humor will help the nurse and the client achieve the goals set for reducing the risk of heart disease. Achieving the motivation and maintaining it to make significant life style changes are probably the hardest tasks that individuals have. It is known that

a habit begins with small thread but forms a cable impossible to break. a person will not work on breaking that cable unless they can see the benefits. Therefore, the first step is personal motivation. The clients should be encouraged to view themselves and the necessary changes in a positive light. The nurse needs to develop a plan, following her assessment of the client that is individualized and hopefully effective for that person. First, the nurse needs to seek to understand what the patient wants. This can be done by using open ended questions. Ask the patient to describe the goals or anticipated outcomes of the lifestyle changes. After these goals are elicited, the nurse will need to show personal interest in the client and continue to offer encouragement. Even during times of failure, the nurse can be a great support in helping the person to put the failure behind them and move forward.

Another positive approach to motivation is the warmth and good feelings that the client gets from the nurse. If the client views the nurse as a problem solver and a resource, these feelings will continue. Finally, the nurse will need to get a commitment from the client to pursue the goals set. Just to get them thinking about this commitment. As the old habits are replaced by the new healthy habits, the person will begin to feel better and move toward the goals. <sup>(38)</sup>

### **Exercise:**

A prescribed walking program helps promote blood flow by contracting the skeletal muscles and may reduce symptoms of peripheral vascular disease. For patients recovering from cardiac surgery or a myocardial infarction, activity is gradually increased. Exercise is very important for optimum cardiac functioning. A cardiac rehabilitation program is usually prescribed, and individualized exercise goals are determined. After discharge from the hospital, exercise three times a week for 20 to 30 minutes is encouraged. Mild stretching should be done before and after the exercise. <sup>(42)</sup>

## **Exercise Regularly:**

Regular exercise at an appropriate level improves the body's metabolism as well as conditioning the heart muscles. Physical conditioning from a regular exercise program generally increases the amount of activity a patient can do before developing chest discomfort. Physical exercise helps in losing weight and in maintaining weight loss. It also makes smoking cessation easier, improves lipid levels, lowers blood pressure, and increases the patient's feeling of well being. Better physical conditioning improves a person's chances of surviving a myocardial infarction.

Formal cardiac exercise programs are supervised and tailored to the abilities of the patient, and these programs increase exercise levels appropriately but gradually. In such programs, stress testing is often used as a guide when planning a safe level of exercise for a patient. Planned programs are ideal, but even the addition of light everyday exercise to a sedentary life can reduce mortality rates <sup>(36)</sup>

## **Daily Activities:**

Initially patients are kept on bed rest with a bedside commode for bowel movements to decrease myocardial oxygen demand. Then activity is advanced gradually as tolerated. Patients can control their angina by the way they live their daily lives. Heart ischemia is brought on when heart muscle is asked to work hard. Many tasks that cause chest pain can be done without discomfort simply by doing them more slowly or in smaller chunks. Walking, climbing stairs, vacuuming, raking, and lifting can all be done in a more leisurely way. Washing, carrying, and lifting should be done with fewer items. In their jobs, heart patients may have to learn to allot more time to each task. Patients should be taught the basics of their

disease. They should learn that their sensitivity to ischemia will vary during the day (for example, angina is more likely in the early morning and just after meals) and according to the weather (cold weather is more stressful).

For some people, anger, frustration, and other strong emotions can cause ischemic episodes. These patients need help in calming their emotions, and they should be referred to therapy programs that emphasize behavioral modification and that provide practical coping techniques for stressful situations. In addition, relaxation techniques, mental focusing strategies, and yoga have all proven useful in reducing stress for patients with coronary artery disease <sup>(36)</sup>

### **Adopting an Activity Program:-**

Additionally, the patient needs to undertake an orderly program of increasing activity and exercise for long-term rehabilitation as follows:

Engaging in a regimen of physical conditioning with a gradual increase in activity duration and then a gradual increase in activity intensity, Walking daily, increasing distance and time as prescribed, Monitoring pulse rate during physical activity until the maximum level of activity is attained, Avoiding activities that tense the muscles: isometric exercise, weight-lifting, any activity that requires sudden bursts of energy, Avoiding physical exercise immediately after a meal, Alternating activity with rest periods (some fatigue is normal and expected during convalescence), Participating in a daily program of exercise that develops into a program of regular exercise for a lifetime <sup>(45)</sup>

### **Diet:**

Teaching the patient to eat a healthy, balanced diet is important to help reduce the risk for coronary artery disease. Weight reduction, if needed, is encouraged, as well as increasing physical activity. In May 2001 the National Heart, Lung, and

Blood Institute released therapeutic lifestyle changes (TLC) that are recommended to help control CHD risk factors.

A diet low in sodium may be prescribed if excess fluid volume is a problem. If diuretics are used that promote potassium loss, potassium levels must be monitored and adequate amounts of potassium included in the diet. To reduce fat, red meats, fried foods, whole milk, and cheese should be limited or avoided. Cholesterol can be reduced by avoiding egg yolks, organ meats, animal fats, and shellfish. Five to six servings of fruits and vegetables should be eaten daily. Increasing fish intake and eating poultry without skin are parts of a healthy diet. <sup>(36)</sup>

There are limited findings available on coronary artery disease (CAD) risk factors and nutritional pattern of CAD patients in Iran. The purpose of this study was to compare nutritional related risk factors of CAD patients with that of matched controls. Consumption of fish, tea and vegetable oils shown to have protective effect on CAD while full fat yoghurt and hydrogenated fats increase the risk of CAD. Moreover, CAD patients obviously have higher blood lipids and sugar concentrations, blood pressure, body fat percent and BMI levels compared with their matched counterparts <sup>(46)</sup>

### **Eat a Low-Fat Diet:**

Eating nutritiously will slow the development of atherosclerosis. Simply reducing the overall calories in patients' diets will improve their lipid profile, and reducing the amount of fat will improve lipid levels even further. For a heart healthy diet, it is especially important to remove or limit foods that are high in saturated fats and Trans fats. Instead, diets should be filled with fruit, vegetables, and whole grains. In addition, is associated with a reduced incidence of coronary artery disease events, although the mechanism behind this benefit is not well understood <sup>(36) (47)</sup>



Nutritional evaluation, counseling, and monitoring are essential to helping patients improve their diet. However, it is unrealistic to expect that a single nutritional educational session or program will result in long-term adherence to a sensible diet. Moreover, patients may find it difficult to absorb a large amount of information in a short period of time. Some patients particularly those with comorbidities such as diabetes, obesity, or heart failure, as well as those from culturally and linguistically diverse backgrounds may require more nutritional information and counseling than they can obtain in the context of a group program. These factors make it especially important for patients and their family members to consult with a dietician on a regular basis. Many hospitals offer preventive and therapeutic nutrition classes with an emphasis on cardiovascular health. <sup>(36)</sup>

### **Eat more vegetables and fruits:**

Vegetables and fruits are good sources of vitamins and minerals. Vegetables and fruits are also low in calories and rich in dietary fiber. They contain substances found in plants that may help prevent cardiovascular disease. Eating more fruits and vegetables may help you eat less high fat foods, such as meat, cheese and snack foods. Select whole grains Whole grains are good sources of fiber and other nutrients that play a role in regulating blood pressure and heart health. You can increase the amount of whole grains in a heart healthy diet by making simple substitutions for refined grain products <sup>(47)</sup>

### **High Fiber Guidelines:**

Dietary fiber helps to reduce elevated cholesterol, one of the risk factors for coronary artery disease. Fiber, the part of plants the body cannot digest, also helps to control blood sugar and manage weight, while also reducing the risk of gastrointestinal disease by increasing bowel regularity. The recommended intake for

total fiber for adults up to age 50 is 25 grams per day for women and 38 grams for men. For those over age 50, the recommended intake is 21 grams for women and 30 grams for men. To consume enough fiber, eat whole grain products, fruits and vegetables, and legumes (such as dry beans, lentils, and peas).<sup>(47)</sup>

During the acute phase of an MI, small, easily digested Meals are served. Caffeine is usually restricted because it increases heart rate and causes vasoconstriction. Fluids maybe restricted if the patient is in heart failure as well. Initially a low-sodium clear liquid diet may be ordered.

Then a low fat, low-cholesterol, and low-sodium diet may be orders number of grams of sodium is prescribed by the physician. If the patient is obese, a dietitian may work with the patient and family to devise a diet that is suitable and palatable for the patient.<sup>(3)</sup>

The fall and winter seasons will bring cooler temperatures, and for some, ice and snow. It's important to know how cold weather can affect your heart, especially if you have cardiovascular disease. People who are outdoors in cold weather should avoid sudden exertion, like lifting a heavy shovel full of snow. Even walking through heavy, wet snow or snow drifts can strain a person's heart.<sup>(5)</sup>

## **Cholesterol:**

Cholesterol is a substance present in all of us. Our bodies make cholesterol. It's also present in meat and dairy foods. Plant foods don't have cholesterol. There are several types of cholesterol, including low-density lipoproteins (LDL) and high density lipoproteins (HDL). LDL cholesterol is called bad cholesterol because it can build up on the inside of your arteries, causing them to become narrow. HDL is called good cholesterol because it protects your arteries from plaque buildup.

### **Lowering LDL cholesterol:**

Lowering your LDL cholesterol level will help keep plaque from building up in your arteries. This makes it easier for your heart to get the blood and nutrients it needs. If you already have coronary artery disease, probably want you to lower your LDL level by at least 30 to 35 percent through dieting, exercising and possibly, medicines. Another way to help is to increase your HDL level. If you can reduce your LDL level to less than 130 and increase your HDL level to at least 50, you're on the right track, when trying to lower your LDL cholesterol, you want to add foods that are low in cholesterol and saturated fats, because your body turns saturated fats into cholesterol. To do this, add foods that are high in soluble fiber. Limiting how much saturated and Tran's fats you eat is an important step to reduce your blood cholesterol and lower your risk of coronary artery disease. A high blood cholesterol level can lead to a buildup of plaques in your arteries, called atherosclerosis, which can increase your risk of heart attack and stroke <sup>(38)(48)</sup>

### **High blood cholesterol levels:**

High levels of cholesterol in your blood can increase the risk of formation of plaques and atherosclerosis. High cholesterol can be caused by a high level of low density lipoprotein (LDL), known as bad cholesterol. A low level of high density lipoprotein (HDL), known as good cholesterol, also can promote atherosclerosis <sup>(44)</sup>

### **Stop Smoking:**

Smoking injures cells throughout the body. Smoking contributes to the development of atherosclerotic cardiovascular disease, a variety of cancers, Cigarette smoking is one of the most powerful predictors for the development of coronary artery disease in all age groups. In patients who already have coronary

artery disease, smoking is associated with a higher likelihood of myocardial infarction and of sudden cardiac death. Explain the medical consequences to patients who smoke, and strongly recommend that they stop smoking. It is difficult for smokers to quit on their own. Make an agreement with your patients that on a specific date they will begin to wean themselves from cigarettes. Then help them get into a program that includes support, counseling, and the availability of anti smoking medications.

Smoking causes vasoconstriction that can last up to 1 hour after the smoking of one cigarette. For patients with cardiac or vascular disease, blood flow is reduced, which can exacerbate symptoms. Patients should be encouraged to stop smoking and should be provided with support information such as cessation programs and support groups. (2)(49) Cigarette smoking worsens coronary atherosclerosis and increases the risk of lung disease, cancer, myocardial infarction, and death. Within a year of quitting smoking, a patient's risk of acute coronary syndromes drops almost to the level of a nonsmoker. Becoming a nonsmoker also lengthens a person's life; for example, 35 year old smokers who quit smoking increase their lifespan by 3 to 5 years. Therefore, healthcare providers should strongly urge patients to quit smoking and help them to enroll in a smoking cessation program. In addition, they should advise patients to avoid spending time in places where other people smoke <sup>(22)</sup>

### **A variety of smoking cessation programs:**

The symptoms of nicotine withdrawal begin with in a few hours and peak twenty four to forty eight hours after quitting. The drug bupropion hydrochloride (zyban) is now available and is an option for people who have been unsuccessful using nicotine replacement formerly prescribed as an antidepressant reduces the withdrawal symptoms associated with smoking cessation Smoking should be avoided, and patients are instructed on the hazards of continuing to smoke. Referral

to a tobacco cessation program can be made. The nurse needs to work with patients to help them understand and accept lifestyle changes. <sup>(3) (43)</sup>

Many smokers yearn to stop but find it hard because of nicotine's power full addictive hold in fact most people need more than one attempt before they successfully stop .here are some suggestions to help you stop smoking :-

do you home work examine the wide range of self help materials available look into cessation programs talk to ex smokers find out how they stopped and what they found helpful .

Make small changes limit places where you smoke, smoke in only one room in your home or even out side , change different brand that's less satisfying .pay attention to your smoking as you prepare to stop smoking , pay attention to your behavior , plan to cope with them when you stop , practice coping with these situations without smoking .

Seek help participate in a formal program. The more help you get the better your chance of success. be motivated list your reasons for stopping to increase your motivation , smokers who were more motivated to stop were twice as likely to be successful in stopping as these who were less motivated . Set a stop date make it a day with low stress, tell your friends, spouse and coworkers your intention let them know how they can support your efforts. <sup>(6)</sup>

Don't let the tobacco companies win get made and take back your life. It's been long known that un ethical practice occur in the tobacco industry such as:-

Suppressing evidence linking tobacco with ill health, Using nicotine to enhance the addictive properties of tobacco, Circulating misleading information masking the health consequences of smoking. <sup>(43)</sup>

## **Caffeine:**

Caffeine occurs naturally in coffee, tea and chocolate, indication that you may be using too much caffeine include difficulty sleeping, headache, tiredness, irritability, nervousness, vague depression. <sup>(6)</sup>

### **Obesity:**

Obesity is defined as an excessive accumulation of fat on the body. When one is 20% - 30% over average for height, weight, and body structure, this creates a problem with respiration and circulation. Abdominally distributed obesity seems to be especially highly correlated with atherosclerosis. Closely associated with obesity are hypertension, hypercholesterolemia, elevated triglycerides, increased blood glucose levels, reduced carbohydrate tolerance, sedentary lifestyle, and reduced HDL levels. As you can see, reducing weight may bring other modifiable factors under control as well. The added strain on the work of the heart requires increased circulation to the coronary arteries. As a result, the heart receives two insults from obesity: increased work and blocked arteries. <sup>(38)</sup>

Many overweight people are stymied by trying to lose weight success at weight loss require the key ingredients of knowledge, commitment, reasonable eating and regular physical activity and exercise. The lose weight you need to modify your life style .you will need to make changes in your diet and physical activity level.

Check your food intake carefully and estimate how many calories they are eating, eating as established time, avoid fat intake, eat more fresh vegetables  
Limit regular soft drinks, use a daily multivitamin especially if you limit your calories, and prepare foods with less salt, weight yourself once per week is often enough. <sup>(6)</sup>

Weight reduction, if needed, is encouraged, as well as increasing physical activity. Lifestyle and Cardiac Care to reduce risk factors or promote recovery from

cardiovascular disease, lifestyle changes are often needed. Longstanding habits are difficult to change. Support groups can offer encouragement that is helpful in promoting a healthy lifestyle. Patients should be referred to community support groups as needed. <sup>(44)</sup>

Excess weight strains the heart, and excess fat leads to continuous high levels of blood lipids. Weight loss improves blood lipid profiles and helps lower blood pressure in overweight and obese people. For coronary artery disease patients who are overweight, weight loss can reduce the severity of their angina

Exercise alone rarely leads to significant weight loss; a reduced calorie diet is necessary. Reducing patients' overall calorie intake will also improve their lipid profile. Besides eating fewer calories, scheduled meals and preplanned menus make weight loss easier. Weight loss programs include these and other techniques, and formal programs with regular advice, counseling, and supervision usually have the most success. From any starting weight, a loss of 10% should be considered a success if the patient manages to maintain the lower weight <sup>(36)</sup>

### **Cold weather:**

Many people aren't conditioned to the physical stress of outdoor activities and don't know the dangers of being outdoors in cold weather. Winter sports enthusiasts who don't take certain precautions can suffer accidental hypothermia. Hypothermia means the body temperature has fallen below 95 degrees Fahrenheit. It occurs when your body can't produce enough energy to keep the internal body temperature warm enough. It can kill you. Heart failure causes most deaths in hypothermia. Symptoms include lack of coordination, mental confusion, slowed reactions, shivering and sleepiness.

Children, the elderly and those with heart disease are at special risk. As people age, their ability to maintain a normal internal body temperature often decreases. Because elderly people seem to be relatively insensitive to moderately cold conditions, they can suffer hypothermia without knowing they're in danger. People with coronary heart disease often suffer angina pectoris (chest pain or discomfort) when they're in cold weather. Some studies suggest that harsh winter weather may increase a person's risk of heart attack due to overexertion.

Besides cold temperatures, high winds, snow and rain also can steal body heat. Wind is especially dangerous, because it removes the layer of heated air from around your body. At 30 degrees Fahrenheit in a 30-mile wind, the cooling effect is equal to 15 degrees Fahrenheit. Similarly, dampness causes the body to lose heat faster than it would at the same temperature in drier conditions.

To keep warm, wear layers of clothing. This traps air between layers, forming a protective insulation. Also, wear a hat or head scarf. Heat can be lost through your head. And ears are especially prone to frostbite. Keep your hands and feet warm, too, as they tend to lose heat rapidly.

Winter as the Prime Time for Heart Attacks Though research is still developing on the subject , there is a rise in the number of heart attacks during the winter months. Some studies suggest that people with coronary artery disease, or disease that occurs when cholesterol builds up within the walls of the heart's arteries, are at higher risk for heart attack during harsh winter weather. People with coronary artery disease also typically experience chest pain, or angina, in cold weather. The reasons for this are twofold. Cold weather causes the arteries to tighten, slowing blood flow and reducing the amount of oxygen that reaches the heart. The body is also overexerting itself as it needs to work harder to obtain oxygen and stay warm <sup>(5)</sup>

### **Oral Contraceptives:**



In some women, oral contraceptives will increase blood pressure and thrombus formation. These factors need to be considered when determining the use of these drugs, especially for women who have a history of thrombophlebitis. Women who smoke are at higher risk when taking oral contraceptives. The doses of estrogen have been reduced in the current formulations of these products; therefore, the risk might have been reduced slightly. <sup>(38)</sup>

## **Diabetes:**

Diabetes is a disorder of metabolism the way our bodies use digested food for energy. Most of the food we eat is broken down into glucose, the form of sugar in the blood. Glucose is the body's main source of fuel. After digestion, glucose enters the bloodstream. Then glucose goes to cells throughout the body where it is used for energy. However, a hormone called insulin must be present to allow glucose to enter the cells. Insulin is a hormone produced by the pancreas, a large gland behind the stomach. In people who do not have diabetes, the pancreas automatically produces the right amount of insulin to move glucose from blood into the cells. However, diabetes develops when the pancreas does not make enough insulin, or the cells in the muscles, liver, and fat do not use insulin properly, or both. As a result, the amount of glucose in the blood increases while the cells are starved of energy (50)

People with diabetes have a higher incidence of atherosclerotic heart and artery disease than people without diabetes, and 80% of the people with type 2 diabetes die from some form of cardiovascular disease. All coronary artery disease patients with diabetes should be enrolled in a comprehensive diabetes management program. A reasonable goal for patients with diabetes is to reduce their glycosylated hemoglobin (A1C) level to below 7% <sup>(21)</sup>

## **The Effect of Diabetes on the Circulatory System:**

In a healthy body, the concentration of glucose in the blood is kept under control by insulin, a hormone secreted by the pancreas. When insulin bonds to special receptors in the body, the liver starts removing glucose from the blood and storing it for future use.

In a person with diabetes, the pancreas either can't produce insulin or the liver stops responding to the hormone. As a result, glucose concentrations in the blood rise to dangerous levels. These abnormally high blood-glucose levels gradually damage the inner lining of blood vessels (the vascular endothelium), especially the coronary arteries.

In response to the damage caused by high glucose levels, the body heals the endothelium of the coronary arteries. However, just as scar tissue forms where skin is damaged, thin layers of cholesterol form between the newly repaired endothelium and the pre existing outer layers of the coronary artery. Known as "plaques," these cholesterol deposits effectively narrow the arteries and make them less flexible. This hardening of the arteries is called "atherosclerosis" and leads to increased blood pressure. There are five components of diabetes management: Nutritional management, Exercise, Monitoring, Pharmacologic therapy Education.<sup>(51)</sup>

### **Control diabetes mellitus:**

Diabetes mellitus is a chronic illness requiring a lifetime of special self management behaviors. Because diet, physical activity, and physical and emotional stress affect diabetic control, patients must learn to balance a multitude of factors. They must learn daily self-care skills to prevent acute fluctuations in blood glucose, and they must also incorporate into their lifestyle many preventive behaviors for

avoidance of long-term diabetic complications.

Diabetic patients must become knowledgeable about nutrition, medication effects and side effects, exercise, disease progression, prevention strategies, blood glucose monitoring techniques, and medication adjustment. In addition, they must learn the skills associated with monitoring and managing diabetes and must incorporate many new activities into their daily routines. An appreciation for the knowledge and skills that diabetic patients must acquire can help the nurse in providing effective patient education and counseling.

Blood glucose monitoring is a cornerstone of diabetes management, and self-monitoring of blood glucose (SMBG) levels by patients has dramatically altered diabetes care. Frequent SMBG enables people with diabetes to adjust the treatment regimen to obtain optimal blood glucose control. This allows for detection and prevention of hypoglycemia and hyperglycemia and plays a crucial role in normalizing blood glucose levels, which in turn may reduce the risk of long-term diabetic complications.<sup>(1) (38)</sup>

## **Hypertension:**

Also known as high blood pressure is a condition in which the blood pressure, on at least two or more readings on different dates after an initial screening, is found to be higher than normal. If the systolic blood pressure is above 140 mm Hg or the diastolic blood pressure is above 90 mm Hg, an adult age 18 or older should be evaluated for hypertension by a health care provider.

Patients may need more information, guidance, and support from the health care team. Referrals to other resources such as the dietitian, social worker, pharmacist, and home health nurse should be included (Home Health Hints). The patient and family should be allowed to maintain a sense of control, make informed decisions

regarding care, and develop the skills necessary to make lifestyle modifications. Behavioral changes are the most difficult for the patient to initiate and maintain. The nurse plays a major role in therapy and treatment compliance for hypertensive patients.

The use of educational programs in hospitals, clinics, churches, and health fairs helps increase patient motivation to adhere to antihypertensive therapy. Instructions provided by the nurse are directed toward helping patients control their blood pressure through self care measures, as well as the prescribed medical regimen. To effectively control hypertension, patients must be knowledgeable about their condition. They need to be taught about hypertension, its treatment, and the need for a lifelong commitment to controlling it <sup>(2)</sup>

Education for this person will include important ways to control blood pressure. The client will need to have blood pressure checked often, and be encouraged to keep the records to create the self efficacy needed to gain results. The client may have a friend, or family member, or someone at the local grocery store or community center, take their blood pressure. This way, the client is accountable to the plan. The client should, however, have a consistent plan and have the blood pressure taken at the same place, same time of day and in a reclining position. An important factor in the regulation of hypertension is to make sure the client pays attention to their sodium intake. Special populations, to include those with high blood pressure, should limit their intake of sodium to 1,500 milligrams per day. This can be accomplished by teaching them to read nutritional labels on packaged food and by decreasing the amount of salt added to the diet. Omitting highly salty foods, and refraining from adding more salt after the food is prepared, will help <sup>(38)</sup>

### **Personal Medication Organizer:**

Poly pharmacy is a critical issue for most consumers with one or more chronic

diseases. This innovative tool has been developed to educate consumers about medication use and to support daily medication adherence. It includes a comprehensive medication log for tracking up to 30 medications and supplements.

The Personal Medication Organizer was released in January of 2006 just in time for Medicare Part implementation. The Personal Medication Organizer, along with your branded pill boxes, can help you support your patients or members during this transition

Depression Recognition & Management Resource, It is well documented that depression is one of the most frequently unrecognized and untreated chronic medical conditions. Yet, depression exacts tremendous human and financial costs. Significant indirect costs of depression are often manifested through poorly managed self care of chronic diseases, or unhealthy behaviors such as overeating, physical inactivity, substance abuse, etc. Getting the message to consumers that depression is a medical condition that can be treated, educating them about evidence based care options, and providing them the words that they can use to approach primary care physicians is critical. Understanding Depression has been designed to promote depression prevention, recognition, evidence based care, and good self care <sup>(52)</sup>

The Individualized Care Index, a measure of the extent to which nurses individualize their care of patients the concept of individualized care is frequently alluded to in professional nursing in descriptions of quality patient care. It is addressed both as the process by which high levels of quality care and patient satisfaction are achieved and as the outcome of selected nursing care modalities such as primary nursing in a hospital setting Individualized nursing care translates all standardized nursing procedures and activities in terms of the uniqueness of each patient situation. Individualized care can also be said to include patient centered communicative responses where concern for patients' thoughts or problems is

expressed and a willingness to listen and to stimulate patients' self-care potential is provided. High levels of individualized nursing care are reported to be both an outcome of a nursing care modality (primary nursing) and the process by which high levels of patient satisfaction and quality care are achieved. The concept of individualized care also emerged in descriptions of the nursing process and quality patient care. An essential of nursing education is to motivate nurses to think in terms of each individual patient.<sup>(44)(52)</sup>

### **Patient compliance:**

Compliance involves not only taking the prescribed medications but also adherence to follow-up appointments and maintaining the recommended lifestyle modifications. Furthermore, the patient should be an active participant in the plan of care. Patients' knowledge of coronary vascular diseases and its complications is an important factor in achieving better compliance, and hence control. Patients can often be managed with lifestyle modifications and medications to control symptoms of angina. The most important factor is patient education.

Patients need to understand the importance of their symptoms and when to seek medical attention. The pain must be evaluated initially and whenever a change in pattern or lack of response to treatment occurs. The outcome depends on the coronary artery that is affected. The earlier the person enters the healthcare system, the better the prognosis is, because emergency measures will be available for otherwise fatal arrhythmias. There is a better outcome for patients who receive adequate medical attention and make appropriate lifestyle changes post myocardial infarction. Cardiac rehabilitation can help patients make these changes safely.

Lifestyle changes and medications can significantly impact the risks of the individual. Dietary modification, activity, and medications can help to alter the disease process. Patients who continue with prior bad habits will continue with

disease progression. Risk factors include age, male gender, and family history. <sup>(5)</sup>

### **Denial in Coronary Heart Disease:**

Coronary heart disease, and the experiences associated with it, precipitate many sudden changes that severely disrupt the balance of psychosocial and environmental factors in an individual's life. Those who experience these changes use various resources, such as denial, in an attempt to cope with the anxiety caused by the various types of threatened or real losses associated with the myocardial infarction. Denial is the ability of an individual to mentally ignore or push from consciousness the reality of the situation at hand. It is one of the first adaptive behaviors or mechanisms that a client uses during the stress producing event of an acute episode of chest pain. For coronary clients, it is not difficult to use denial as a form of coping because once the pain has been alleviated and the client is comfortable, there are no other symptoms. The individual may rationalize or deny that anything significant has occurred. The ability to temporarily deny the meaning of an illness reduces the concomitant stress and anxiety caused by the loss and may be one factor that enhances the survival rate during the initial infarction period. <sup>(43)</sup>

### **Self esteem and concept:**

Self esteem is an individual's generalized sense of worth and value, or how a person regards self. Self esteem refers to an individual's self evaluation, whereas self concept is a broader term encompassing an individual's overall self description.

Self concept (an individual's perception of self) affects every aspect of life, including relationships, functional abilities, and health status. No two people have an identical self concept, self concept is what helps make each individual unique. Everyone has both positive and negative self assessments in the physical, emotional, intellectual, and functional dimensions, which change over time and according to the

context of the situation. Because self concept is an individual's frame of reference for perceiving and interacting with the world, it exerts a powerful influence on one's life. Though neither visible nor tangible, a positive self concept is one of the greatest strengths a person can possess. Self concept is composed of four components:

Identity, body image, self esteem, and role performance by considering these four elements of self concept, nurses can more effectively respond to a client <sup>(4)</sup> <sup>(5)</sup>

### **Self-Management Support Programs:**

Self management support programs assume a complex sequence of effects. Developers expect these programs to change patients' behavior by increasing the patients' self efficacy and knowledge. Improved behavior is expected to lead to better disease control which should, in turn, lead to better patient outcomes and reduced utilization of health care services, particularly preventable emergency room visits and hospitalizations, and ultimately to reduced costs. This sequence of assumptions gives self management support programs multiple objectives and multiple endpoints for evaluation. The pivotal objective, however, is to change people's behavior.

Self management is a major part of the national nursing research agenda, with new discoveries being made to enhance the evidence base and improve treatment regimens and quality of life. Research demonstrates that self management strategies improve patient outcomes by empowering patients to understand their conditions and take responsibility for their health. The Coronary Artery Disease Program is a telephone based chronic disease management program available to members with coronary artery disease. In 2004, the Cardiac Hospitalization Atherosclerosis Management Program undertaken at the University of California at Los Angeles focused on the initiation of guideline based therapies for CVD risk reduction in hospitalized patients with CAD. The Cardiac Hospitalization Atherosclerosis Management Program demonstrated a significant reduction in morbidity and



mortality ( $P < .05$ ) in patients receiving nurse directed case management compared with usual care 1 year after hospital discharge. This trial became the cornerstone for the American Heart Association's "Get with the Guidelines" national initiative.<sup>(53)</sup>

Nurse directed case management has been shown to be effective not only in individuals with multiple risk factors, but also in treating single risk factors in young and older populations, in diverse ethnic groups, and in individuals with comorbidities. The greater than 10 million nurses worldwide represent the largest group of health care providers with the requisite education and position in their communities required to take on the role of case managers for CVD risk reduction. Nurses are highly respected and valued by patients, patients' families, and the health care community and thus are ideal to fill this important role.

The worldwide personal and societal costs related to diseases of the vascular system are enormous. International research efforts have focused on discovering ways to implement prevention strategies shown to be both effective and cost efficient. Teams comprising health care professionals with expertise in nursing, dietetics, physical activity, and behavioral skills have shown high levels of success in preventive efforts, particularly in high risk and vulnerable populations. Used appropriately, team based, nurse directed case management has the potential to effect positive change in both primary and secondary prevention of cardiac and other vascular diseases<sup>(53)</sup>

### **Surgical nursing care:**

Percutaneous transluminal coronary angioplasty (PTCA) is a minimally invasive procedure that helps reduce symptoms of CAD. A catheter is inserted via the femoral or brachial artery and is advanced into the heart. Once the blocked coronary artery is entered, the balloon on the catheter is inflated.

This procedure compresses the plaque against the wall of the artery, thus restoring the opening of the artery. The symptoms of CAD are usually reduced, but the underlying progression of atherosclerosis continues. Reocclusion of the artery often occurs within a few months. Over time, PTCA may need to be repeated. <sup>(35) (54)</sup>

Coronary atherectomy is used to cut and remove plaque from atherosclerotic coronary arteries. The catheter has a central rotating blade that shaves off the plaque and contains it for removal and pathological analysis. Calcium channel blockers are given before the procedure to prevent vasospasms from the vibrating cutter. To prevent clot formation, an antiplatelet agent is given after the procedure. <sup>(2) (28) (55)</sup>

Coronary artery stents are used to prevent closure of a coronary artery from an atherosclerotic lesion. Stents are placed in a procedure similar to PTCA. A stent provides support to a coronary artery wall at the area of stenosis to keep blood flowing through the artery. Different types of materials, such as bioabsorbable materials or stainless steel mesh, and designs, such as self expanding or balloon expandable, are used to make stents.

Coronary artery bypass graft (CABG) surgery involves bypassing one or more blocked coronary arteries. Patients who have severe CAD or have had myocardial infarctions may be candidates for a CABG. Patients usually have a cardiac catheterization to identify blocked coronary arteries and determine the need for surgery.

Transmyocardial laser revascularization is a newer treatment option for patients unable to have angioplasty or coronary artery bypass surgery. Channels are made through the myocardium into the ventricles in areas of ischemia with a fiberoptic catheter. However, it is not known why this procedure decreases symptoms of ischemia and improves quality of life. <sup>(2) (56)</sup>.

## **Preparation for Surgery:**

Before undertaking minor surgical procedures, all healthcare professionals need to equip themselves with the appropriate skills, so that they can perform these procedures as competently and as safely as possible. This requires both receiving and imparting a variety of verbal and written information, and the ability to produce it if necessary.

Good patient information is important as it can serve several vital functions. The Department of Health (2003) maintains that it provides the following benefits.

Patients are given confidence, improving their experience, Patients are reminded of the main points discussed, Enables informed decisions to be made, with time to absorb and reflect on the information, Ensures patients arrive on time for appointments, Ensures involvement of patients and their careers, Helps to reduce patient anxieties.

For elective heart surgery, patients may be admitted to the hospital 1 to 3 days before the surgery based on their medical history. A nursing assessment is important to provide baseline data that can be used for post operative comparison and early discharge planning. <sup>(1) (57)</sup>

In addition to routine admission testing, patients with chronic obstructive pulmonary disease (COPD) may have pulmonary function tests and baseline arterial blood gases (ABGs) done. Patients with carotid bruits have carotid studies to determine the amount of occlusion in the carotid artery. If the occlusion is significant, a carotid endarterectomy, which removes the plaque on the lining of the blocked or diseased carotid artery, is performed, usually several weeks before having cardiac surgery.

Medications that may increase bleeding or reduce fluid volume may be ordered by the physician to be held before surgery. Drugs that increase bleeding include aspirin, often stopped 3 to 7 days preoperatively, warfarin (Coumadin), often stopped 4 to 5 days preoperatively; and heparin, stopped 4 hours pre operatively. <sup>(25)</sup>  
(55) (56)

During surgery fluid volume and blood pressure may be decreased by blood loss or medications. Therefore diuretics, which could further reduce fluid volume and blood pressure, are withheld up to 2 days before surgery. Because the patient takes nothing by mouth (NPO) 8 to 12 hours before surgery, insulin and oral hypoglycemic agents are reduced or withheld the morning of surgery. Patients recover more quickly and have less postoperative Stress when they have thorough preoperative teaching.

Explanations of pain management, endotracheal tube (ETT), methods of communicating, ventilator, chest tubes, coughing and deep breathing exercises, intravenous (IV) lines, urinary catheter, incision care, and various equipment alarms are provided to the patient and family.

It should be emphasized that patients are not able to talk while the ETT is in place. Additionally, a preoperative family tour of the patient's initial postoperative unit and the waiting area helps prepare them for the surgical experience. A referral to Pastoral care, if desired, can be comforting to the patient and family.

The anesthesiologist assesses the patient before surgery and orders preoperative medications. An antiseptic scrub shower is taken the night before and the morning of surgery. The patient is NPO after midnight the night before surgery.  
(28) (33) (58)

## **Post-operative care:**

Preparation should be made on the ward to receive a patient on return from theatre: Suction and oxygen should be placed beside the bed and checked to ensure they are working, IV stands or bed cradles should be placed ready for use ,The bed space located in a position for ease of observation, The bed is prepared with clean linen.

Immediate post-operative care is undertaken in the recovery room by specially trained nurses, who ensure that the patient has fully recovered from anesthesia, and that her general condition is stable enough to allow transfer to the ward. <sup>(17) (59)</sup>

The time spent in the recovery room may vary from a few hours to several days in high-dependency care, depending on the surgical procedure. The essential care in the immediate post-operative period consists of: Maintenance of a clear airway and breathing, General observation and monitoring of vital signs to detect hemorrhage or deterioration in condition, Relief of pain and discomfort, Monitoring fluid balance <sup>(25) (28) (60)</sup>

## **Complications:**

Multiple complications can occur immediately following acute MI. Mechanical complications include cardiogenic shock, acute and chronic heart failure, ventricular aneurysm, intra-cardiac thrombus, stroke, right ventricular infarction, pericarditis, mitral regurgitation caused by papillary muscle dysfunction or rupture, recurrent chest pain or reinfarction, and rupture of the interventricular septum or left ventricular free wall. Electrical complications include ventricular fibrillation, ventricular tachycardia, atrial fibrillation, sinus arrest, and heart block. Careful monitoring and frequent examinations may be helpful in detecting these complications before they become life-threatening. Often forgotten, complications of MI are the psychological and socioeconomic effects on the patient. Depression after MI is a powerful independent risk for mortality in the months after discharge.

Potential complications that may develop include the following:-

Acute pulmonary edema, Congestive heart failure, Cardiogenic shock, Dysrhythmias and cardiac arrest, Myocardial rupture, Pericardial effusion and cardiac tamponade.

(1) (12) (27)

### **Cardiac Rehabilitation:**

Cardiac rehabilitation is a professionally supervised program to help people recover from heart attacks, heart surgery and percutaneous coronary intervention (PCI) procedures such as stenting and angioplasty. Cardiac rehabilitation programs usually provide education and counseling services to help heart patients increase physical fitness, reduce cardiac symptoms, improve health and reduce the risk of future heart problems, including heart attack

Cardiac rehabilitation is begun when the patient's acute symptoms are relieved. The purpose of cardiac rehabilitation is to improve cardiac function and assist the patient to return to as normal a life as possible. Cardiac rehabilitation protocols are used in many institutions. The first two phases of rehabilitation occur in the hospital. Activities for each hospital day, such as types and amounts of self-care and activity, are specified in protocols. The third phase begins with hospital discharge and focuses on returning to prior levels of activity and function. Outpatient programs are often ordered for patients in this phase. In this phase, patients are encouraged to maintain optimum physical fitness and to continue healthy lifestyles.

(61)(63)(65).

## **Methods and Material:**

The methods and material of this study which were used the assess of nurses knowledge and practice about coronary artery diseases, and the impact of proposed training program for nurses about care of patients with coronary artery diseases, methods and materials of this study will be presented in three main designs as follows:

- 1- Technical design.
- 2- Operational design.
- 3- Statistical design.

### **Technical Design:**

Technical design of the study included study design, study area, setting, study population, sampling, data collection tools and scale system.

### **Study design:**

This quasi experimental hospital based study conducted to evaluate the effectiveness of educational program for nurses about teaching of patients on coronary artery diseases.

### **Study area:**

The study area is Elmek Nimer University Hospital in Shendi city, River Nile State, Sudan, Shendi town is located north of Khartoum, about 176 km. and 110 km south to Elddamer, the capital of River Nile State, and Shendi town is lies on the eastern bank of the River Nile with a total area about 14596 Km<sup>2</sup>. The total population of Shendi locality is estimated at about 197589 of whom 116713 live in rural areas and 80876 in urban centers, most of them are farmers. Shendi University

was established in the early 1990s and stands as a landmark institution in Higher Education.

### **Study Setting:**

This study was carried out at Al-mak Nimer university hospital. Which hospital was established in 2002. It is the second university hospital in Sudan. The hospital provides most types of medical services (medicine, surgery, Obstetric and Gynecological, pediatric and outpatient clinics complex). Beside these there are cardiac, renal and oncology centers). In this hospital there is a big theater complex in which most type of general operations are done. In addition to these, some of special surgery (Ophthalmic and laparoscopic surgery) are also performed in this theater complex.

### **Study population:**

The population of this study constitutes of all the nurses are working at Elmek Nimer University Hospital, caring for patients with CAD during the period of study and fulfills the inclusion criteria

### **Inclusion criteria:**

- Nurses who have BSC.
- Nurses who have permanent job.
- Nurses who had experience more than one year in the CCU.

### **Exclusion criteria:**

- Nurses during houseman period.
- Nurses who work as part timer.
- Newly graduated nurses who work less than one year.



- Nurses who have diploma in nursing.
- Nurses whose did not attend all section of the educational program .

## **Sampling:**

### **1- Sampling techniques:**

The sample was taken from all nurses' staff, total coverage of all nurses working in the Al-mak Nimer university hospital and fulfills the inclusion criteria.

### **2- sample size:**

Total number of all nurses on the study (60nurse) constitutes the size of this sample. Full coverage sample responders are nursing staff.

## **Data collection tools:**

For this study Two tools were used to collect data to achieve the objectives of the study, Data collected by the following means:-

1. Structured questionnaire
2. Observation check list

### **1- Structured questionnaire:**

The questionnaire was developed by researcher based on reviewing of literature, to assess nurse's knowledge about nursing care of patient with coronary vascular diseases mainly self care the questionnaire consists of five parts:

The first part was designed to collect demographic data of study participants (age, sex, experience, and previous attendance of education program) this part included four (4) closed ended questions.

The second part was developed to collect data about the knowledge of

participants regarding coronary artery diseases. (Such as definition of disease, risk factors, clinical features). This part included ten (10) closed questions.

The third part was designed to collect data about the knowledge of participants regarding the self care management program. This part included five (5) closed questions testing the knowledge of the nurses on the study about self management (such as purpose, components, design of self management).

The fourth part was developed to collect data about the knowledge of participants regarding the life style changes and health education.( Such as exercise, nutrition, weight reduction, chronic diseases, smoking ). This part included fifteen (15) closed question.

And the fifth part was designed to collect data about the knowledge of participants regarding the compliance of medications. (Such as nitroglycerine, anticoagulants) This part included six (6) closed questions.

## **2-Observational Checklist & scoring system:**

An observational checklist was designed by the researcher guided by reviewing of text books to check the nurse's skills. This checklist included important procedures to collect data about the nurses practice regarding educational program to patient with CAD. Each one of this contain different steps, every procedure include main steps. To evaluate the performance of nurses at the different procedures the researcher used the following grads on assessing the performance of the subject (Good, Faire, poor& not done).

- Good for the best performance of the procedure is considered as (3) three
- Fair for the average performance of the procedure is considered as (2) two
- Poor for the fails to perform satisfactory is considered as (1) one.

- Not done is considered as (0) zero.

The check list was divided further into ten (10) check lists for the different procedures, to evaluate each procedure may have different steps to be checked. The total grade score in every procedure is considered as good if the nurse scored between  $> 2- 3n$  where ( n) is the number of steps, and considered fair if score  $> 1-2n$  and considered poor if scored one n or less. For this the total number of degree may vary.

The observational checklist including checklist about: teaching process 16 step , education about CAD 12 step , teaching about chest pain 16step , teaching about activity 15 step , teaching about nutritional care 18step , teaching about deal with obesity 16 step , teaching about chronic diseases 20 step , teaching about avoid smoking 7steps , teaching about emotional health 18 step, teaching about medications compliances 22step .

### **Scale system:**

The researcher used the following procedures, for maintaining teaching process, the degree for this procedure as follows. Poor performance (1-16), Faire performance (17-32) and Good performance (33-48). For performing education about CAD, the degree of this procedure as follows. Poor performance (1-12) Faire performance (13-24) and Good performance (25-36).

For performing teaching about care of chest pain, the degree of this procedure as follows Poor performance (1-16) Faire performance (17-32) and Good performance (33-48). For performing teaching about activity, the degree of this procedure as follows Poor performance (1-15) Faire performance (16-30) and Good performance (31-45).

For performing teaching about nutrition, the degree of this procedure as follows Poor performance (1- 18) Faire performance (19-36) and Good performance

(37-54). For performing teaching about obesity, the degree of this procedure as follows Poor performance (1- 16) Faire performance (17-32), and Good performance (33-48).

For performing teaching about chronic diseases(hypertension and diabetes mellitus) , the degree of this procedure as follows Poor performance (1-20) Faire performance (21-40) and Good performance (41-60). For performing teaching about smoking, the degree of this procedure as follows Poor performance (1- 7) Faire performance (8-14) and Good performance (15-21).

For performing teaching about emotional health, the degree of this procedure as follows Poor performance (1-18) Faire performance (19-36) and Good performance (37-54). For performing teaching about medications compliance, the degree of this procedure as follows Poor performance (1-22). Faire performance (23-44).and Good performance (45-66).

### **Operational Design:**

Operational design included a pilot study, data collection technique, ethical consideration and the program

### **Pilot Study:**

A pilot study was carried out after the development of the study and before embarking on the actual study (data collection). It was conduct during October 2011 in order to test applicability of the tools of data collection, and to estimate the time required for filling the required forms , It was carried out on ( 10 nurses ) to evaluate the contents of the tools so as to find out if the items were under stood by the nurses . Pilot study applicability under the pleaded for questionnaire, check list and the program. The results of this pilot study were as follows:

- The nurses understand the method used to fulfill each tool. They indicated

that some items needed to be modified, rephrasing, omission, whether these items stay as it is or by adding some words.

- Based on this pilot results modification were made in the questionnaires and check lists, at the final the researcher assure that each tool is most likely going to achieved the aim of the study .
- The sample of pilot study (10nurses) was excluded from the total subject of the research work.

### **Data collection technique:**

In this study the data was collected in three phases, the first phase (pretest phase), was run before implementation of education program, in which the questionnaire was dispensed for participants and each one of them is allowed sufficient time to fill it, all participants return questionnaire back. Then regarding the practical the researcher was assigned a code for each one of participant to facilitate the observation of them in the clinical area by using observational checklists. This observational process was taken about two month. Nurses were known that the researcher was observing their practice while they perform educational program. After collection of pretest data ( first phase) the participants were receive the coronary artery diseases training program in four sessions , the training is continued four months, that means one group each month , after that the trainee (nurses) implement this program during their practice and the researcher told them that their knowledge and practice will be evaluated and observed with the same tools, four months later the same tools used in pretest was used to collect mid test data (the second phases) which take about two months, at the beginning of second phase, four nurses apologized to continue in this program for different reasons they were excluded from data analysis and then after other four months later the third phase was started (post test two) to collect the last post intervention data so as to

compare the results of these three phase (tests), to make a judgment about the knowledge and practice of nurses regard this training program.

### **Ethical considerations:**

To conduct the study the permission and the approval of the directors of the hospital was taken through the Dean of the Faculty of post graduate studies. Permission was taken from hospital general manager and from the nursing headquarters (matron) and the manger of CCU complex. The purpose of study was explained to each one of participants. And the researcher assured them that the data collected from the questionnaire will be remain confidential and it's not allowed for any person to identify it. Responders were informed that they could refuse to participate in the study, and withdraw from it at any time. .

### **Educational Program:**

An educational program was designed by the researcher based on actual assessment of nurse's needs to provide them with update knowledge and practice regarding care of CAD. This program was design with reference to center of disease control and prevention (C.D.C), WHO, American heart association (A.H.A), preventive strategies for CAD, guide lines to control risk factors of CHD. Beside this program was approved by the hospital general manager. The program was taught and demonstrated in a simple way using both Arabic and English language to cover the relevant theoretical and practical aspects of CAD. Different teaching methods were used such as lectures, discussion, demonstration and role play. Also different assisting learning methods were used such as, small books; hand out pictures, videos and real patients. After pre test the program was implemented to the nurses in small groups. The researcher distributed the study group (60 nurse) into four (4) small groups, each group include (15) nurse. This implementation program was conducted

as (16) lecture for knowledge & (16) session for demonstration procedures, this step took four months on teaching and demonstration.

The program was implemented in four sections. Each session took about two hours, every group conducted in one month. Section One Included information about CAD ( definitions , causes , symptoms & signs and classification, managements, complications ).this section was conducted in two lecture . Section Two Included information about self management support program. Life style change this section was conducted in two lectures.

Section three included information about modifiable risk factors of CAD This section took nine lectures to be conducted. Section four included information about medication compliance, rehabilitation and teaching process. this section was conducted in three lectures . Every lecture was given four times during the period of implementation to cover all the four groups. At the end of each session each one of attendants was assessed for his or her understanding of the session .the impact and outcome of the program was based on the improvement of the study group.

### **Statistical Design:**

The collected data in pretest and post test was organized, and analyzed statistically using percentage, chi- square test and one way a nova test to find out the relation between pre and post test. Using a computerized statistical package for social sciences (SPSS version). The results were demonstrated as tables and figures showing numbers and percentages. significant level considered if p value < 0.05.

## Results:

There were 60 nurses participated in this study, (90%) were female and (86.7%) of the participants were between 20 and 40 years old.(50%) of the participants were between 2-4 years of experience,(56.7%) of nurses were not attend an CAD program. **table (1).**

Before application of the program the mean of knowledge about (CAD) is (31.7%), and (28.3%) of nurses were aware about definition of CAD, (36.7%) of nurses were aware about Non modifiable risk factors of CAD, (41.7%) of nurses were aware about Modifiable risk factors of CAD, (25%) of nurses were aware about Clinical feature of CAD, (26.7%) of nurses were aware about physical examination of CAD. while ongoing first assessment program the mean of knowledge about (CAD) is (71%), and (75%) of nurses were become aware about definition of CAD, (91.7%) of nurses were aware about Non modifiable risk factors of CAD, (66.7%) of nurses were aware about Modifiable risk factors of CAD, (58.4%) of nurses were aware about Clinical feature of CAD, (63.4%) of nurses were aware about physical examination of CAD. when the program was being applicated the mean of knowledge about CAD is (83%) and(80%) of nurses were become aware about definition of CAD . **table (2)**

Before conduction of the program, The mean of nurses knowledge about management of CAD is (33.3%) and (36.7%) of nurses were aware about Pharmacological management of CAD, (21.7%) of nurses were aware about Types of Anticoagulants, (43.3%) of nurses were aware about Nursing diagnosis of CAD, (28.3%) of nurses were aware about Potential Complications of CAD, (36.7%) of nurses were aware about Nursing planning of CAD.



But ongoing first assessment program the mean of nurses knowledge was become (78.3%) and (80%) of nurses were aware about the Pharmacological management of CAD, (68.3%) of nurses were aware about Types of Anticoagulants, (73.3%) of nurses were aware about Nursing diagnosis of CAD, (81.7%) of nurses were aware about Potential Complications of CAD, (88.3%) of nurses were aware about Nursing planning of CAD. when the program was being applicated the mean of knowledge about management of CAD Is (86.3%) and(85%) of nurses were become aware about the pharmacological management of CAD . **table (3).**

Regard the nurses knowledge about self management the mean of knowledge before starting of the program is (26.7%) and (25%) of nurses were aware about Definition of self management program (SMP), (16.7%) of nurses were aware about Purposes of SMP, (23.3%) of nurses were aware about Components of SMP, (38.3%) of nurses were aware about Design of SMP, (30%) of nurses were aware Important of follow up.

During at first post intervention assessment the mean of nurses knowledge is (72.7%) and (70%) of nurses were aware about Definition of self management program (SMP), (56.7%) of nurses were aware about Purposes of SMP, (73.3%) of nurses were aware Components of SMP, (75%) of nurses were aware about Design of SMP, (88.3%) of nurses were aware about Important of follow up. The mean of nurses knowledge about self management is become (80.3%) and (76.3%) of them were know Definition of self management at last post implementation of the program. With significant statistical different between pre and post intervention (p. value = 0.000). **table (4)**

Before application of the program the mean of nurses knowledge about Lifestyle changes is (22.5%), and (21.7%) of nurses were aware about Lifestyle

changes, (25%) of nurses were have good knowledge about Readiness to learn, (18.3%) of nurses were aware about factors lead to chest pain, (25%) of nurses were aware about Action for symptom.

While ongoing first assessment post intervention the mean of nurses knowledge about Lifestyle changes is (62.5%), and (63.3%) of nurses were aware about Lifestyle changes, (71.7%) of nurses were have good knowledge about Readiness to learn. (66.7%) of nurses were aware about factors lead to chest pain, (48.3%) of nurses were aware about Action for symptom. In last post intervention assessment the mean of knowledge about Lifestyle changes is (75.8%), and (80%) of nurses were aware about Lifestyle changes. **table (5)**

Before application of the program the mean of knowledge about exercise is (29.1%), and (38.3%) of nurses were aware about important of exercise, (23.3%) of nurses were aware about plan of exercise, (16.7%) of nurses were aware about Modification of exercise.

After application of the program the mean of knowledge about exercise is (59.4%), and (53.3%) of nurses were aware about important of exercise, (75%) of nurses were aware about plan of exercise, (50%) of nurses were aware about Modification of exercise. In last post intervention assessment the mean of knowledge about plan of exercise is (76.7%) and (75%) of nurses were aware about important of exercise. With significant statistical different between pre and post intervention (p. value = 0.000). **table (6)**

Before conduction of the program, the mean of nurses knowledge about nutrition of CAD is (31.7%) and (41.7%) of nurses were aware about nutrition teaching of CAD, (23.3%) of nurses were aware about content of diet, (30%) of nurses were aware about weight reduction. But ongoing first assessment the mean of nurses knowledge was become (72%) and (80%) of nurses were aware about the

nutrition teaching of CAD, (66.7%) of nurses were aware about content of diet, (70%) of nurses were aware about weight reduction. when the program was being applicated the mean of knowledge about nutrition of CAD Is (80%) and (85%) of nurses were become aware about the nutrition teaching. With significant statistical different between pre and post intervention (p. value = 0.000). **table (7)**

Regard the nurses knowledge about chronic diseases the mean of knowledge before starting of the program is (30%) and (33.3%) of nurses were have good knowledge about hypertension. (26.6%) of nurses were have good knowledge about diabetes mellitus

At first post intervention assessment the mean of nurses knowledge about chronic diseases is (65.8%) and (63.3%) of nurses were have good knowledge about hypertension. (68.3%) of nurses were have good knowledge about diabetes mellitus. while the mean of nurses knowledge about chronic diseases is become (76.7%) and (73.3%) of nurses were have good knowledge about hypertension. (80%) of nurses were have good knowledge about diabetes mellitus at last post implementation of the program .**table (8)**

Before application of the program the mean of nurses knowledge about emotional health is (28.3%), (28.3%) of nurses were aware about Improve emotional, (28.3%) of nurses were aware about reducing anxiety, (28.3%) of nurses were aware about Smoking &tobacco.

While ongoing first assessment post intervention the mean of nurses knowledge about emotional health is (67%), (66.7%) of nurses were aware about Improve emotional, (76.7%) of nurses were aware about reducing anxiety, (60%) of nurses were aware about Smoking &tobacco. In last post intervention assessment the mean of knowledge about emotional health is (80%) and (78.3%) of nurses were aware about improve emotional health. **table (9)**

The mean of nurses knowledge about compliance of medications before starting of the program is (23.6%) and (20%) of nurses were aware about compliance indication. (28.3%) of nurses were aware about Used of nitroglycerine, (23.3%) of nurses were aware about Side effect of nitroglycerine, (18.3%) of nurses were aware about Inactive nitroglycerine, (26.7%) of nurses were aware about Sub lingual nitroglycerine, (23.3%) of nurses were aware about bleeding precaution

During post intervention assessment the mean of nurses knowledge about compliance of medications after starting of the program is (62.2%) and (55%) of nurses were aware about compliance indication. (70%) of nurses were aware about Used of nitroglycerine, (65%) of nurses were aware about Side effect of nitroglycerine, (63.3%) of nurses were aware about Inactive nitroglycerine, (61.7%) of nurses were aware about Sub lingual nitroglycerine, (58.3%) of nurses were aware about bleeding precaution. but on last post intervention the mean of knowledge about compliance of medications is (75%) and (70%)of them were become oriented about compliance indication . **table (10)**

Regard performance of nurses when demonstration of teaching process (53.3%) of nurses were demonstrate good practice post intervention , however (33.3%) of nurses were able to perform in a good way before intervention. And (73.3%) of nurses were demonstrate good practice during last post intervention. **figure (1)**

(43.3%) of nurses were perform education about ( CAD) in fair practice before beginning of the program but when the program was being conducted (50%) of nurses were demonstrate good practice . while the program was last conducted (80%) of nurses were demonstrate good practice . **figure (2)**

(41.7%) of nurses were had poor practice when demonstrate teaching about care of chest pain before application of the program, whereas (25%) of them were demonstrate good practice when the program was carried out. but(76.7%) of them were demonstrate good practice when the program was last carried out. **figure (3)**

(53.3%) of study sample were had poor practice when demonstrate teaching about exercise pre application of the program. whereas (35%) were perform this practice in good manner post intervention. And (60%) were perform this practice in good manner at last post intervention. **figure (4)**

(30%) of nurses were had fair practice when demonstrate teaching about nutrition before beginning of the program, whereas (53.3%) of them were demonstrate good practice when the program was carried out. and (73.3%) of them were demonstrate good practice when the program was last carried out. **figure (5)**

According to performance of nurses when education about obesity (56.7%) of nurses were demonstrate good practice post intervention, however (18.3%) of nurses were able to perform in a good way before intervention. While (78.3%) of nurses were able to perform in a good way at last post intervention .**figure (6)**

Before application of the program (26.6%) of nurses were demonstrate good education about chronic diseases whereas (46.7%) of them were demonstrate good practice when the program was carried out. And (68.3%) of them were demonstrate good practice when the program was last carried out. **figure (7)**

(45%) of nurses were perform education about smoking in poor practice before beginning of the program but when the program was being conducted (26.7%) of nurses were demonstrate poor practice . while (75%) of nurses were demonstrate good practice at last post intervention. **figure (8)**

(20%) of nurses were had good practice about teaching to improves emotional health pre application of the program, whereas (58.6%) of them were demonstrate good practice when the program was carried out. And (70%) of them were demonstrate good practice when the program was last carried out. **figure (9)** (38.3%) of nurses were had poor practice when perform teaching about medications compliance before beginning of the program, whereas (13.3%) of them were demonstrate poor practice when the program was carried out. And (75%) of them were demonstrate good practice when the program was last carried out. **Figure (10)**

## **Discussion:**

Coronary artery disease (CAD) is the largest killer in the world. CAD is a leading cause of mortality, morbidity and disability with high healthcare costs. This study was designed to establish education program to help patients with CAD control guide lines. Self management support programs assume a complex sequence of effects. Developers expect these programs to change patients' behavior by increasing the patients' self efficacy and knowledge. Improved behavior is expected to lead to better disease control which should, in turn, lead to better patient outcomes and reduced utilization of health care services, particularly preventable emergency room visits and hospitalizations, and ultimately to reduced costs.

So this study conducted to apply proposed educational program among nurses to assess the effectiveness of this program about self care of patients with CAD. Nurses have improved their knowledge and practice about care of CAD post educational program when compared pre with post education intervention, this may be refer to that more than half (56.7%) of study group had no attended any workshop about CAD before this training program.

The present study showed that, nurses had poor background about teaching process before application of the program, (25 %) of nurses had good knowledge. these evidence has been improved gradually during the post test one to include more than two third and represented by (71.7%), however in post test two (68.3%) of them were became knowledgeable about teaching process .Although (73.3 %) of nurses were demonstrated good practice at last post application of the program. these result had been reflected positively on nurses outcome both knowledge and practice thus lead to improve health care and decreased number of complications .

This study reveals that there is proportional increase in the mean of nurses knowledge about CAD .before attending this program, about (28.3%) of nurses were aware about CAD ,while in first assessment post intervention, (75%) of nurses were became more knowledgeable about CAD with (71%) average mean of knowledge. However in the second post intervention assessment following implementation of the program the mean of nurse's knowledge was increased up (83%) and (80%) of nurses are aware about CAD. With no significant statistical (p.value=0.234) difference between the knowledge of nurses pre and post intervention.

In addition to that, the collected evidences from the obtained result suggested that, the mean of nurse's knowledge about CAD management was just (33.3 %) in pre test phase. However when the program was being implemented in the first assessment the mean of nurse's knowledge was become more than two third (78.3%), furthermore in final post intervention evaluation the mean of knowledge is (86%) and 85%of nurses were become aware enough about CAD management. Although (80 %) of nurses were demonstrate good practice about CAD at final post application of the program .With significant statistical different (p. value =0.002) between pre and post test. These results already correlated and supported by other studies which had been conducted in the United States at 2004 to evaluate nurses who watched the educational program did improve their knowledge and practice about CAD management significantly.

This study clears that nurses were had poor knowledge regard self management program, about (25%) of nurses were good aware about SMP with (26.7%) average mean of knowledge before conduction of this program, even after they receiving education about self management program ,this result improved clearly on post test one as shown by (70 %) of nurses were become good aware



about self management program with (72.7%) average mean of knowledge ,when these result had been changed gradually in post test two the mean of knowledge is(80.3%) and(76.7 %) of nurses were become aware about self management program . With significant statistical (p.value=0.000 ) difference between the knowledge of nurses pre and post intervention. Thus if nurses were has good knowledge about self management program, they will know how to instruct their patients to enhance protective measures. These results already correlated and supported by other studies which had been conducted in USA to understanding of nurses knowledge about self management program for patients with CAD, the study showed that, SMP can improve health status. (lorig KR,etal march 1999).

The study found that (21.7%) of nurses had good knowledge about life style changes with (22.5%) knowledge mean before application of the program. However, when the program was conducted (63.3%) of nurses were aware that good knowledge about life style changes, with (62.2%) knowledge mean. When last post program evaluation was done the mean of knowledge is (75.8%) and (80 %) of nurses were become aware about life style changes. This study shows that there is significant statistical different (p.value =0.000) in the awareness of nurses toward life style changes. Experience of receiving patient education and cardiac Self efficacy significantly affected health behaviors, knowledge on disease itself showed a significant role in making patients change their health behaviors or lifestyle. Practically, clinical nurses should recognize the importance of providing patient education designed to change their lifestyle (Asian nursing research march 2010).

The present study reveal that , only (18.3 %) of nurses were had good awareness about chest pain before application of the program, but when first test was done after the program has been carried out (63.3%) of nurses were had good

knowledge about chest pain, however on last post program evaluation (76.7%) of them were become knowledgeable about chest pain. Although (76 %) of nurses were demonstrate good practice about chest pain at last post application of the program. This study shows that there is no a significant statistical different (p.value =0.927) between pre and post test regarding nurses awareness about chest pain ,so the following finding indicated that nurses responded to the program and that patient should not been at great risk for developed complications and they may been controlled well.

There were good changes in the knowledge of nurses towards exercise. and the study reflects that (26.1%) average mean of nurses knowledge to ward exercise, only (38.3 %) of nurses were had good awareness about important of exercise prior to exposure to the program, but when first test was done after the program has been carried out (53.3 %) of nurses were had good knowledge about important of exercise, with (59.4%) average mean of nurses knowledge about exercise, these finding had been changed and improved during last post program evaluation (80%) of them were become knowledgeable about important of exercise, with(76.7%) knowledge mean. Although (60%) of nurses were demonstrate good practice about exercise in final post application of the program. Because exercise is important and have a role in management of CAD, the benefits of exercise in these patients include improved lipid abnormalities and lower blood pressure and important component of weight loss for the patient, but still there was few of nurses did not include the points of exercise during teaching and this may be harmful for patient and they may developed complications.

The following findings had been compared nurses knowledge about healthy nutrition of CAD, Before application of the program the mean of nurses knowledge was (31.7%) and less than half (41.7%) of nurses were aware about healthy

nutrition of CAD, but in first ongoing assessment the mean of nurses knowledge was become (72%) and (80%) of nurses were aware about the healthy nutrition of CAD. when last post program evaluation was done the mean of knowledge is(80%) and (85 %) of nurses were become aware about the healthy nutrition .This study shows that there is a significant statistical different (p.value = 0.000 ) in the awareness of nurses toward nutrition .Although (73.3%) of nurses were demonstrate good practice about nutrition in second post application of the program .with high evidence which support the effectiveness of the educational program and importance of follow up for nurses.

The results of the present study provide evidence that, before conduction of the program, (30%) of nurses were aware about weight reduction. But when first test was done after the program has been carried out, more than two third (70%) of nurses were aware about weight reduction. however on last post program evaluation (78%) of them were become knowledgeable about weight reduction, although (78.3%) of nurses were good practice about weight reduction in last post application of the program, it have to be all nurses to master this term weight reduction, because being awareness of weight reduction and their signs play a key role in prevention, control, and treatment of CAD diseases.

There was improving in the knowledge of nurses to ward some chronic diseases that can be lead to CAD after implementation of the program with significant statistical different (p.value =0.000) between pre and post test regarding diabetes mellitus. And no significant statistical different (p.value =0.062) between pre and post test to ward hypertension. Before application of the program the mean of nurse's knowledge about chronic diseases is (30%), furthermore the mean of nurse's knowledge about chronic diseases after the program was being carried out is (65.8%). When last post program evaluation was done the mean of knowledge

is(76.7%). so nurses were benefit from the program in regard to knowledge about chronic diseases .While (68.3%) of nurses have demonstrate good practice toward chronic diseases after last performing program.

Generally nurses were illustrating (66.7%) good knowledge about emotional health after implementation of education program. But they (38.3%) of nurses were had poor knowledge before implementation of the program, When last post program evaluation was done (78.3 %) of nurses were become aware about emotional health. the findings of this study indicates that (70%) of nurses were demonstrate good practice regarding emotional health even post program was being implemented. This indicates that the implementation of the program was very effective in enhance nurses knowledge and performance.

This study shows that there is a significant statistical different (p.value = 0.000) in the awareness of nurses toward smoking .because one third of nurses were had weak orientation about smoking prior to program intervention, while most of them were become more oriented about smoking, Although (75 %) of nurses were demonstrate good practice about smoking in second post application of the program. These evidenced of good outcome already reflect in nurses knowledge, and had been showed excellent changes in nurses skills about smoking teaching.

In addition the study found that more than half (53.3%) of nurses were had poor knowledge about medication compliance with (23.6%) knowledge mean before application of the program. However, when the program was conducted (55%) of nurses were aware that good knowledge about medications compliance, with (62.2%) knowledge mean. When last post program evaluation was done the mean of knowledge is (70%) and (75 %) of nurses were become aware about medications compliance. although (75 %) of nurses were demonstrate good

practice about medications compliance in last post application of the program. This study shows that there is a significant statistical difference ( $p$ -value =0.040) in the awareness of nurses toward indication of compliance.

These results already correlated and supported by other studies which had been conducted in USA national institutes of health November 2011 to evaluate the knowledge of adherence to pharmacological treatment.

With reference to the previous studies which had been conducted in other countries to assess the relation of smoking, hyperlipidaemia, obesity This result of study is agree with result of study carried out at Iran and state that different percentage of modifiable risk factors of CAD. The findings showed that the biochemical and physiological risk factors for CAD in the patients were hypertension (43.7%), diabetes (32.5%), hyperlipidaemia (42%), overweight (29.4%). Also, the results brought to surface the fact that smoking was most prevalent in patients (64.9%), On the other hand, there was also a significant relationship between hypertension ( $P < 0.001$ ), hyperlipidaemia ( $P = 0.002$ ), diabetes ( $P = 0.03$ ) and obesity ( $P < 0.001$ ) The American Heart Association (AHA) (Journal of Pakistan medical association JPMA January 2013 Department of Nursing).

This study represent that there was statistically significant relation between nurses knowledge and practice about CAD care because nurses skills regarding avoid risk factors, exercise regiment, diet control was very poor pre intervention but the study reveal that educational program which conducted among nurses had very excellent impact on changing both nurses knowledge and practice. .

Finally regard the opinion of nurses toward establishment of CAD educationnal program to promote their knowledge and practice about care of CAD. Nurses are key to providing effective education. The nurse's role as a patient teacher has changed with shorter acute care stays and more community based care.

patients are becoming partners with health professionals in learning self-management skills.

## **Conclusion:**

The nurse as a teacher is challenged, not only to provide specific patient and family education, but also to focus on the educational needs of communities. Health education is important to nursing care, because it can determine how well individuals and families are able to perform behaviors conducive to optimal self-care.

This study reveal that, nurses knowledge and practice have been very week about care of CAD before implementation of the program, but they response after conduction of the program. And the post test indicate wide variation outcome concerning application of educational program,

This study clears that nurses were had poor knowledge and practice regard self management before conduction of this program, even after they receiving education about self management program improved in post test one and post test two to include all teaching item, there was highly significant statistical difference between the knowledge and practice of nurses pre and post intervention.

Nurses were reveal good practice when perform teaching process .Nurses are indicating that this program was improving their awareness about care of CAD .they were getting more benefit from it theoretically and practically.

Concerning knowledge and practice of nurses regarding care of CAD this study found that is variations between nurse's knowledge and practice about care of CAD. The findings of this study indicate that more of nurses show good knowledge post application of the program. And more of nurses show fair practice about CAD post application of the program. This poor practicing of these demonstration need to be verified to explore the reasons.

## **Recommendations:**

The following points are suggested as suitable recommendations to promote nurses knowledge and practice about care of CAD

- Apply this program and generalized through the country.
- More special centers have to be establishing appropriate health care of CAD.
- Regular training programs regarding self management of patients with CAD.
- Future studies should focus on exploring in detail the specific areas of knowledge and practice deficits.
- Nursing counseling can be provided in more focused manner on risk factors.
- Reevaluation should be done at regular intervals to see the impact of the program.



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## **Appendix 1**

### **Shendi University**

#### **Post graduate college**

#### **Questionnaire**

SN ( )

**Read the following sentences carefully, then Put (√) on the correct statement and (X) on the false statement:-**

#### **Section one personal data:-**

1. Gender : - a. male ( ) b. female ( )

2. Age :- a. 20-40 year ( ) b. above 40 year ( )

3. Experience :-

a. Less than 2 years ( ) b. 2 - 4 years ( ) c. above 4 years

4. Did you attend previous training about care of patients with coronary artery diseases before:-

a. yes and benefit ( ) b. yes and not benefit ( ) c. no ( )

#### **Section two:-**

#### **Knowledge of responders about Coronary artery diseases (CAD):**

5. (CAD) means:-

a. Atherosclerotic heart disease ( )

b. disease affects the coronary arteries ( )

c. Fatty substances (plaque) can build up in coronary artery ( )

d. Block the blood flow of cardiac muscles ( )

6. The following are non modifiable risk factors of (CAD)

a. family history ( )

b. age ( )

c. gender ( )

d. race ( )

**7. The modifiable risk factors of (CAD) include:-**

a. Diabetes mellitus ( )

b. hypertension ( )

c. obesity ( )

d. cigarette smoking ( )

**8. Clinical features of (CAD) include:-**

a. chest pain ( )

b. vomiting ( )

c. shortness of breath ( )

d. syncope ( )

**9. Pharmacological management of patient with (CAD) include:-**

a. analgesics example morphine sulfate ( )

b. vasodilators example nitroglycerine ( )

c. anti platelet example aspirin ( )

d. Beta-blockers such as propranolol ( )

**10. Types of anticoagulants include:-**

a. warfarin ( )

b heparin ( )

c. clopidogrel ( )

d. ticlopidine ( )

**11. Appearance of patient during physical examination include:-**

a. rest less ness ( )

- b. present with pallor ( )
- c .present with diaphoresis ( )
- d. respiratory distress ( )

**12. Nursing diagnoses for the patient with (CAD) include:-**

- a. ineffective myocardial tissue perfusion ( )
- b. anxiety related to fear of death ( )
- c deficient .knowledge about the disease ( )
- d. non compliance related to failure of accept lifestyle changes ( )

**13. Potential common complications that may develop from (CAD) include:-**

- a. acute pulmonary edema ( )
- b. congestive heart failure ( )
- c. cardiogenic shock ( )
- d dysrrhythmias ( )

**14. nursing planning for the patient with (CAD) include:-**

- a. immediate and appropriate treatment ( )
- b. reduction of anxiety ( )
- c. awareness of the disease process ( )
- d. adherence to the self-care program ( )

**Section three:-**

**Knowledge about self management program:-**

**15. Self management for patient with (CAD) include:-**

- a. Tasks that individuals must undertake to live well ( )
- b. Dealing with medical management ( )
- c. Learning about modifiable risk factors ( )

d. Improve control over chest pain ( )

**16. The purposes of Self management for patient with (CAD)**

**includes:-**

a. Change patient's behavior ( )

b. Increasing patients self efficacy ( )

c. Improve patient's knowledge ( )

d. Prevent disease complications. ( )

**17. The components of self management for patient with (CAD)**

**includes:-**

a. Managing symptoms. ( )

b. Adapting to activity. ( )

c. Changing life style. ( )

d. Use of medication. ( )

**18. Design of teaching patient self care includes the following:-**

a. explain the illness ( )

b. explain symptoms of the disease ( )

c. state the actions to take when symptoms develop ( )

d. discuss methods to prevent complications ( )

**19. The important of follow up include:-**

a. assessing and treating patient ( )

b. educating patient and their families ( )

c. supporting patient life style changes ( )

d. monitoring stress ( )

**Section four:-**

**Knowledge about life style changes and health education:-**

**20. Lifestyle changes that will help patient to manage coronary artery disease includes:-**

- a. reducing stress ( )
- b. avoid smoking ( )
- c. avoid alcohol consumption ( )
- d . Approved exercise plan ( )

**21. factors influence patient's readiness to learn and motivation to learn:-**

- a. physical or psychological dis comfort such as pain.( )
- b. fatigue. ( )
- c.anxiety. ( )
- d. fear . ( )

**22. Factors associated with chest pain include:-**

- a. exposure to cold weather ( )
- b. eat a heavy meal ( )
- c. physical exertion ( )
- d. stress ( )

**23. Appropriate action for recurrences of symptoms include:-**

- a. Stop activity. ( )
- b. Complete bed rest. ( )
- c. use medication as prescribed ( )

d. Communication with health professional. ( )

**24. The important of exercise for patient with (CAD) include:-**

a. make heart stronger ( )

b. decrease blood pressure ( )

c. optimum cardiac functioning ( )

d. reduction of weight ( )

**25. Health education for patient with (CAD) about exercise include:-**

a. Exercise three times a week. ( )

b . Exercise For 20-30 minutes. ( )

c. Monitoring heart rate during exercise. ( )

d. Alternating exercise with rest period. ( )

**26. The modification factors about exercises include:-**

a. avoid any exercise that produce chest pain. ( )

b. participating in regular exercise. ( )

c. avoid exercise after meals. ( )

d. avoid activities that tense the muscles. ( )

**27. Teaching self care about nutrition include:-**

a. caffeine restricted ( )

b. fluid restricted in heart failure ( )

c. low sodium ( )

d .low in alcohol ( )

**28. Health education for patient with (CAD) about diet:-**

a. Low in saturated fat. ( )

b. High in fiber. ( )

c. Low in calories. ( )

d. high in protein. ( )

**29. teaching about weight reduction include:-**

a. eating as established time ( )

b. eat more fresh vegetables ( )

c. use a daily multivitamin ( )

d. avoid fat intake ( )

**30. Health education for patient with (CAD) about hypertension include:-**

a. losing weight ( )

b. limiting salt ( )

c. control blood pressure ( )

d. follow up ( )

**31. Health education for patient with (CAD) about diabetes mellitus include:-**

a. control blood glucose level ( )

b. maintain normal blood glucose ( )

c. regular test of blood sugar ( )

d. following diabetes health diet ( )

**32. Health educations for patient with (CAD) about improve emotional health:-**

a. use relaxation technique ( )

b. Exercise regular ( )

c. Eat healthy diet ( )

- a. organize your time more efficiently ( )

**33. Educate patient to reducing anxiety by the following:-**

- a. providing information about the illness ( )  
b. explain methods of management ( )  
c. explain methods preventing its progression ( )  
d. providing psychological support ( )

**34. Health education for patient with (CAD) about smoking and tobacco include:-**

- a. Stop smoking. ( )  
b. Stop tobacco. ( )  
c. Avoid second hand smoke. ( )  
d. arrange follow up ( )

**Section five:-**

**Compliance of medications:-**

**35. Health educations for patient with (CAD) about medication include:-**

- a. adhering to medical regimen ( )  
b. using drugs as prescribed ( )  
c. avoid decongestant ( )  
d. Carry nitroglycerine at all time. ( )

**36. Self educations about nitroglycerine include:-**

- a. Keep in the original container. ( )  
b. Replace every 6 months. ( )  
c. Used before activity. ( )  
d. if pain not relieved call doctor ( )



**37. Side effect of nitroglycerine includes the following:-**

- a. headache
- b. vomiting
- c. burning sensation under the tongue
- d. tingling sensation under the tongue

**38. Nitroglycerine become inactive when exposed to the following:-**

- a . heat
- b. air
- c. light
- d. moisture

**39. Health education for patient to used sublingual nitroglycerin include:-**

- a. make sure the mouth is moist
- b. saliva is not swallowed
- c. non crush tablet between teeth
- d. Take another tablet in 3 to 5 minutes if pain is not resolved

**40. Health educations for patient with (CAD) about precaution from bleeding:-**

- a. Avoid tissue injury.
- b. Apply pressure to the site of any puncture.
- c. Avoid intramuscular injection.
- d. Avoid constrictive devise

## Appendix II

**Observational check list for nurses to assess the demonstration of teaching process:**

<b>Observation</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1) Assess the patient readiness for health education			
2) Welcome and introduces self			
3) Clarifies the role of learner			
4) State learning objectives			
5) Assess the patient health beliefs and behaviors			
6) Use language the person can understand			
7) Provide privacy			
8) Encourage the patient to participate actively in learning			
9) Select time patient comfortable			
10)Assess hearing impairment			
11)Assess cognitive issues			
12)Implementing patient learning			
13)Returns to learning objectives and summarizes			
14)Invites and answer questions			
15)Record the learners responses to the teaching actions			
16)Provide feed back			

### Appendix III

#### **Observational check list to assess nurse's practice when performing education about CAD**

<b>Observation</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1) Summarize General information about CAD			
2) Explain coronary artery diseases			
3) Discuss causes of the disease			
4) Explain non modifiable risk factors of the disease			
5) Explain modifiable risk factors of the disease			
6) Discuss sign and symptom of disease			
7) Teaching about medications			
8) Side effect of medications			
9) Discuss complications of the disease			
10) Explain sign and symptom of complications			
11) Contact to near hospital			
12) Follow up to the doctor			

## Appendix IV

### **Observational checklist to assess nurse's practice when performing teaching about care of chest pain:-**

<b>Observation</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1) Explain nature of chest pain			
2) Explain localize and radiation of chest pain			
3) Explain severity of pain			
4) Avoid any factors that produces chest pain			
5) Physical exertion, which can precipitate an attack			
6) Exposure to cold, which can cause vasoconstriction			
7) Eating a heavy meal, which increases the blood flow to the mesenteric			
8) Stress or any emotion-provoking situation, causing the release of adrenaline			
9) walking against the wind			
10)appropriate action for chest pain			
11)stop activity			
12)Complete bed rest			
13)used nitroglycerine as prescribe			
14)Call doctor if chest pain is not relived in 15 minutes by nitroglycerine			

15)Closely monitor symptom			
16)Contact the physician if shortness of breathing or rapid pulse can occur			

## Appendix V

### **Observational checklist to assess nurse's practice when performing teaching about exercise:-**

<b>Observation</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1) explain important of exercise			
2) explain types of exercise			
3) Participate in a regular daily program of activities			
4) Select activities that do not produce chest discomfort			
5) Select activities that do not produce shortness of breathing			
6) Alternate activity with periods of rest			
7) Avoid physical exercise immediately after meal			
8) Exercise 3 to 5 days per week.			
9) Exercise for 30 to 60 minutes.			
10) gradual increase in activity duration			
11) Gradual increase in activity intensity			
12)Monitoring pulse rate during physical activity			
13)Avoid exercise in cold weather			
14)Avoid exercise that produce chest pain			
15)Avoid any exercise that tense the muscles			

## Appendix VI

### **Observational checklist to assess nurse's practice when performing teaching about nutrition:-**

<b>Observation</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1) Explain important of heart healthy diet			
2) Eat healthy balance diet			
3) Eat diet low in saturated fat			
4) eating too much fiber			
5) Lower in calories			
6) Restricting intake of salt			
7) Vegetables and fruits are good sources of vitamins and minerals			
8) Vegetables and fruits are also low in calories and rich in dietary fiber			
9) Dietary fiber helps to reduce elevated cholesterol			
10)Whole grains are good sources of fiber and other nutrients that regulating blood pressure			
11)Eating more fruits and vegetables may help you eat less high-fat foods			
12)moderation in eating milk			
13)stay away from egg yolk			
14)cheese limited			

15)avoid shellfish			
16)Eat small meal			
17)Restricting intake of caffeine			
18)Avoid alcohol consumption			



## Appendix VII

### **Observational checklist to assess nurse's practice when performing teaching about obesity**

<b>Observation</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1) explain obesity as risk factor of CAD			
2) Determine factors lead to obesity			
3) Lose weight need to modify lifestyle			
4) Eating as established time			
5) Eat more fresh vegetable			
6) Use a daily multivitamins			
7) Avoid fat intake			
8) lose weight and reach the ideal weight as possible			
9) limit regular soft drinks			
10)limit your calories			
11)prepare foods with less salt			
12)scheduled meals and preplanned menu			
13)information about maintaining your weight			
14)participate in supervised weight reduction program			
15)teaching about exercise plan			
16)weight yourself once per week			

### Appendix VIII

#### **Observational checklist to assess nurse's practice when performing education about chronic diseases:-**

<b>Observation</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1) explain chronic diseases as risk factors of CAD			
2) important to control blood pressure			
3) Teaching about achieve and maintain normal blood pressure			
4) Exercising can help you lower your blood pressure.			
5) losing weight			
6) eat low fat diet			
7) restriction intake of caffeine			
8) limiting how much salt			
9) avoid alcohol you consume			
10)avoid quitting smoking			
11)teach about medications to lower your BP			
12)regular check of blood pressure			
13)encourage to keep the record			
14)Following recommendations that ensure blood pressure in control			
15)Teaching about maintain normal blood glucose			
16) Measurement of blood sugar level.			

17) Following diabetic healthy diet			
18)test your blood sugar before and after exercising			
19)You may need medicine to lower your blood sugar			
20)Following recommendations that ensure blood glucose in control			

## Appendix IX

### **Observational checklist to assess nurse's practice when performing teaching about smoking**

<b>Observation</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1) Smoking contribute to the development of CAD			
2) avoid smoking			
3) avoid use of tobacco			
4) avoid second hand smoke			
5) quitting can help you avoid future heart problems			
6) counseling about effectiveness of smoking			
7) instructed on hazards of continuing			

## Appendix X

### **Observational checklist to assess nurse's practice when performing teaching about emotional health**

<b>Observation</b>	Good	Fair	Poor
1) improve emotional health			
2) Treatment if you feel sad.			
3) Treatment if you anxious.			
4) Treatment if you angry, or isolated.			
5) Support Depression is linked to complications such as irregular heartbeats, chest pain.			
6) get mental health treatment often show improvements in BP			
7) organize your time more efficiency			
8) provide information about the illness			
9) provide psychological support			
10)Regular exercise			
11)Pursuing activity that relieve and reduce stress			
12) motivate for normal activities of life			
13)Adaptive for normal activities of life			
14)increasing the perceptual field, alertness, and awareness			

15)enhances learning and usually is not perceived as stressful			
16) Reduced alertness to environment.			
17)limited attention of problem solving			
18) Motivate you to relax and help you to reduce stress.			

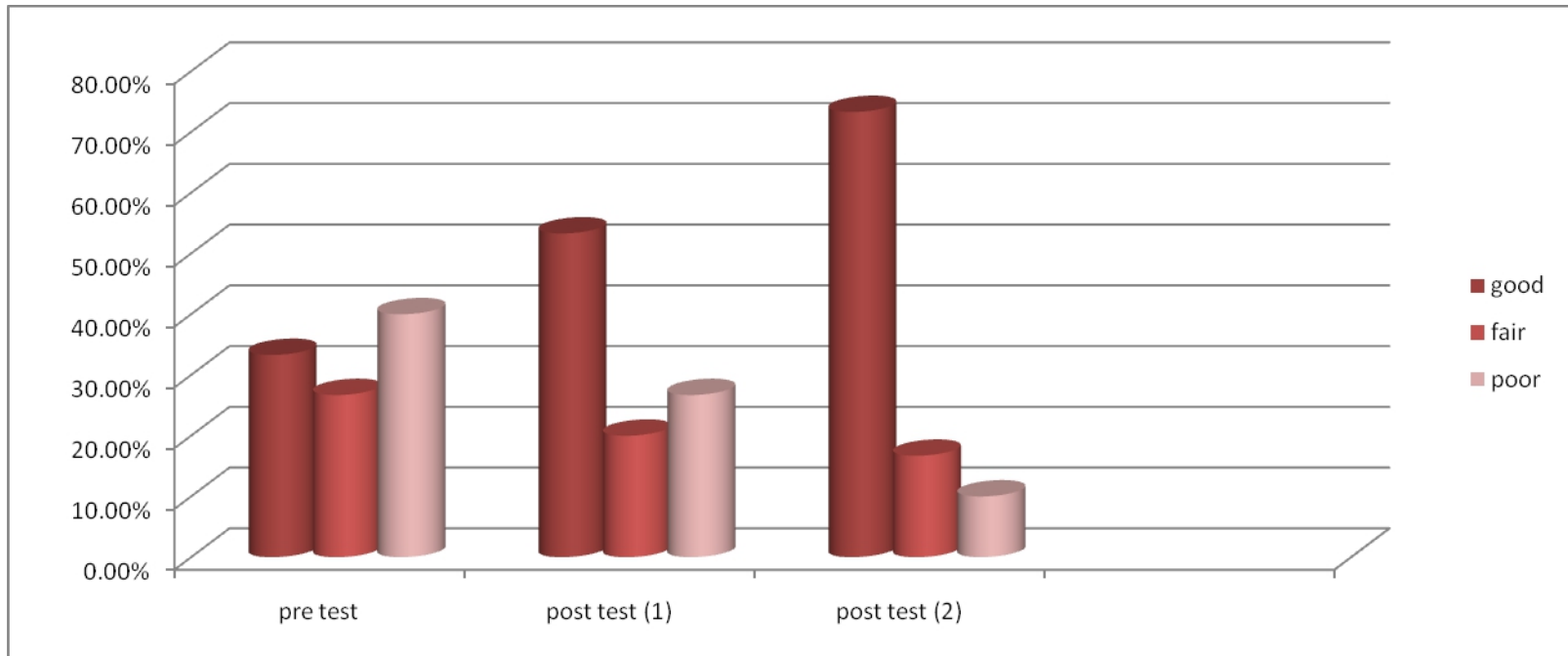
## Appendix XI

### **Observational checklist to assess nurse's practice when performing teaching about medications compliance**

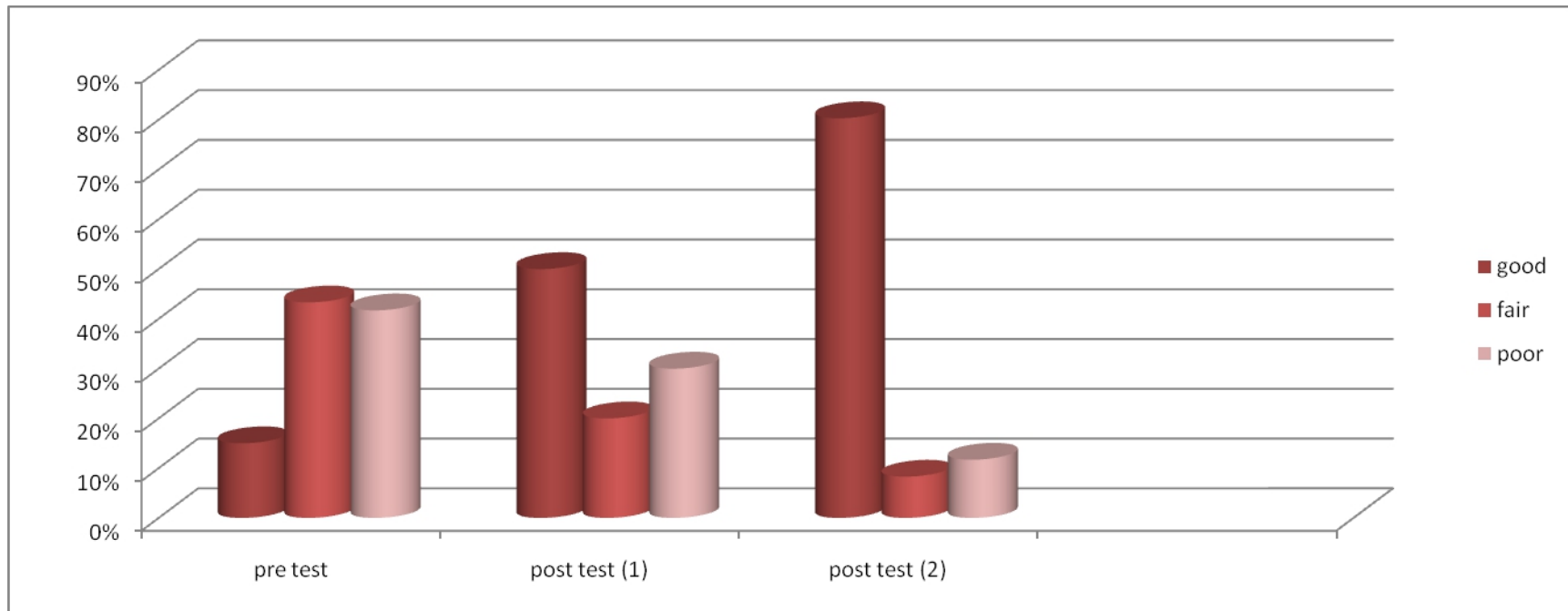
<b>Observation</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1) explain important of compliance			
2) Take medication as prescribed			
3) Avoid using medications without discussing with a health care provider			
4) Adherence to follow up and maintaining lifestyle modification			
5) Active participant in the plan of care			
6) Explain prevention from complications			
7) Teaching about sub lingual nitroglycerine			
8) Explain effectiveness of nitroglycerine			
9) Make sure the mouth is moist			
10) Determine position of tablet			
11) The tongue is still and saliva is not swallowed until the tablet dissolves			
12) If the pain is severe crush the tablet between the teeth			
13) Advise the patient to carry the medication at all times as a precaution			
14) Tablet should be carried securely in its original			

container			
15) Explain that tablet is activated by heat, air, and time			
16) Recommend that the patient note how long it takes for the nitroglycerin			
17) Advise emergency medical services when no response			
18) Discuss side effects of nitroglycerine			
19) bleeding precautions when used anticoagulants			
20) Avoiding tissue injury and bruising from trauma			
21) Applying pressure to the site of puncture for a longer time			
22) Terminate session			

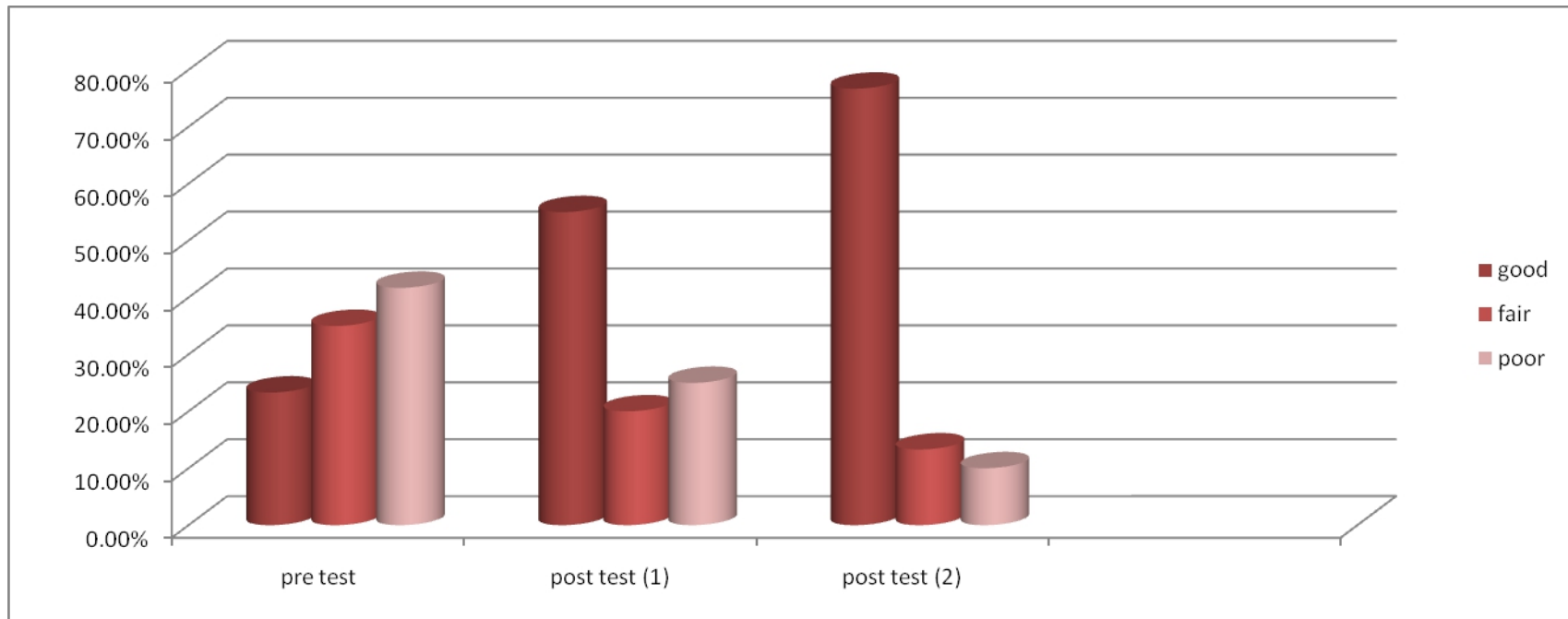




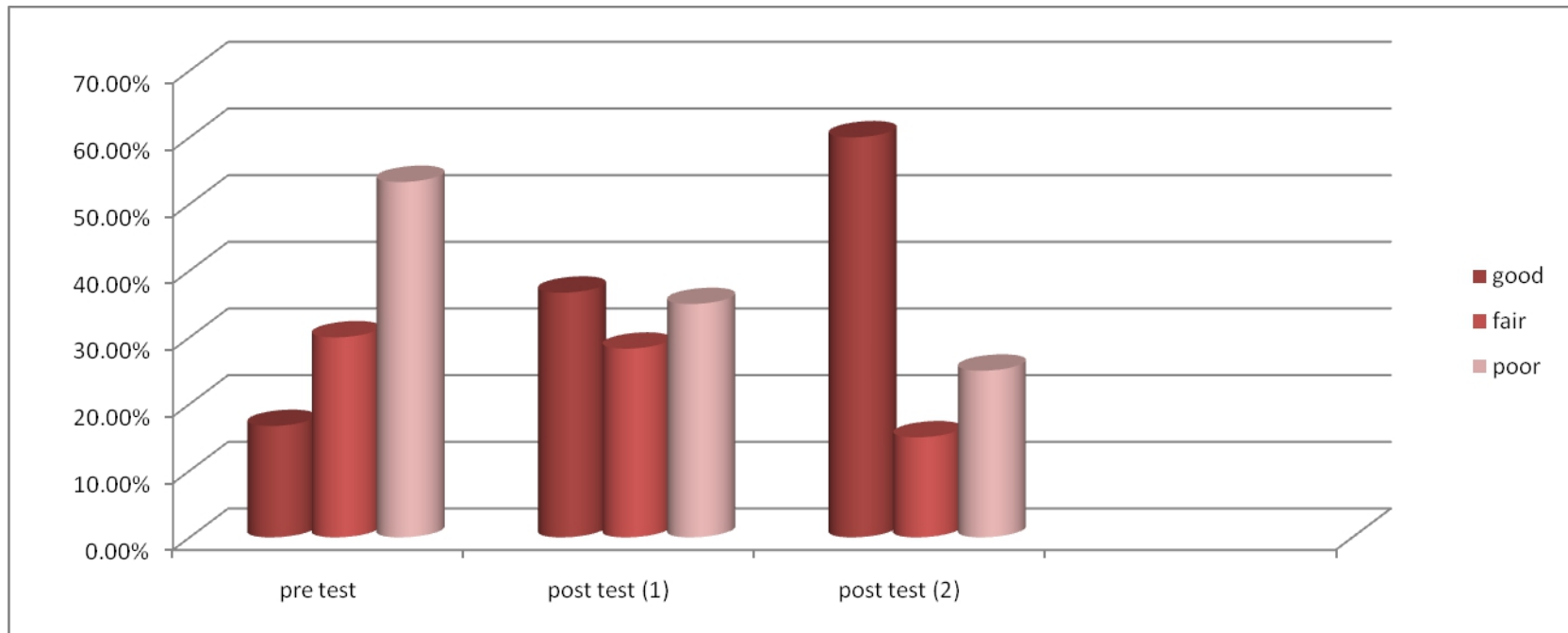
**Figure (1) demonstration of teaching process.**



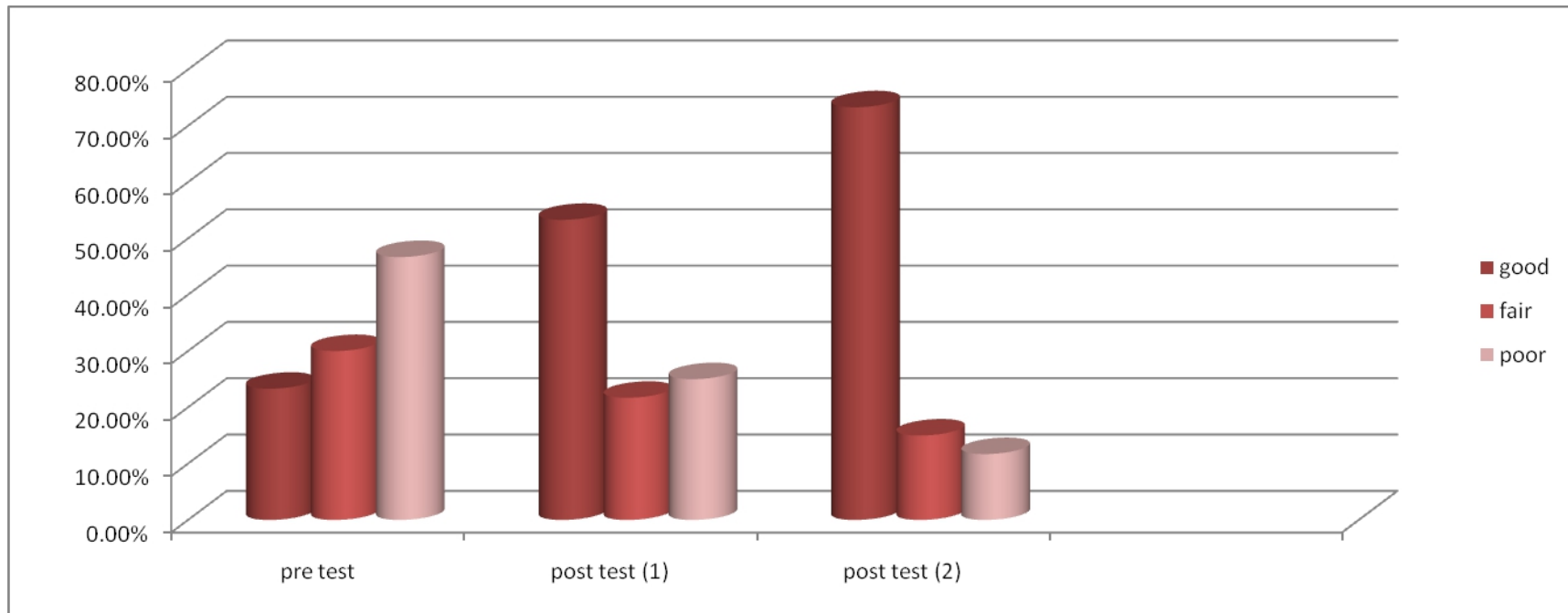
**Figure (2) performs education about general information of coronary artery diseases.**



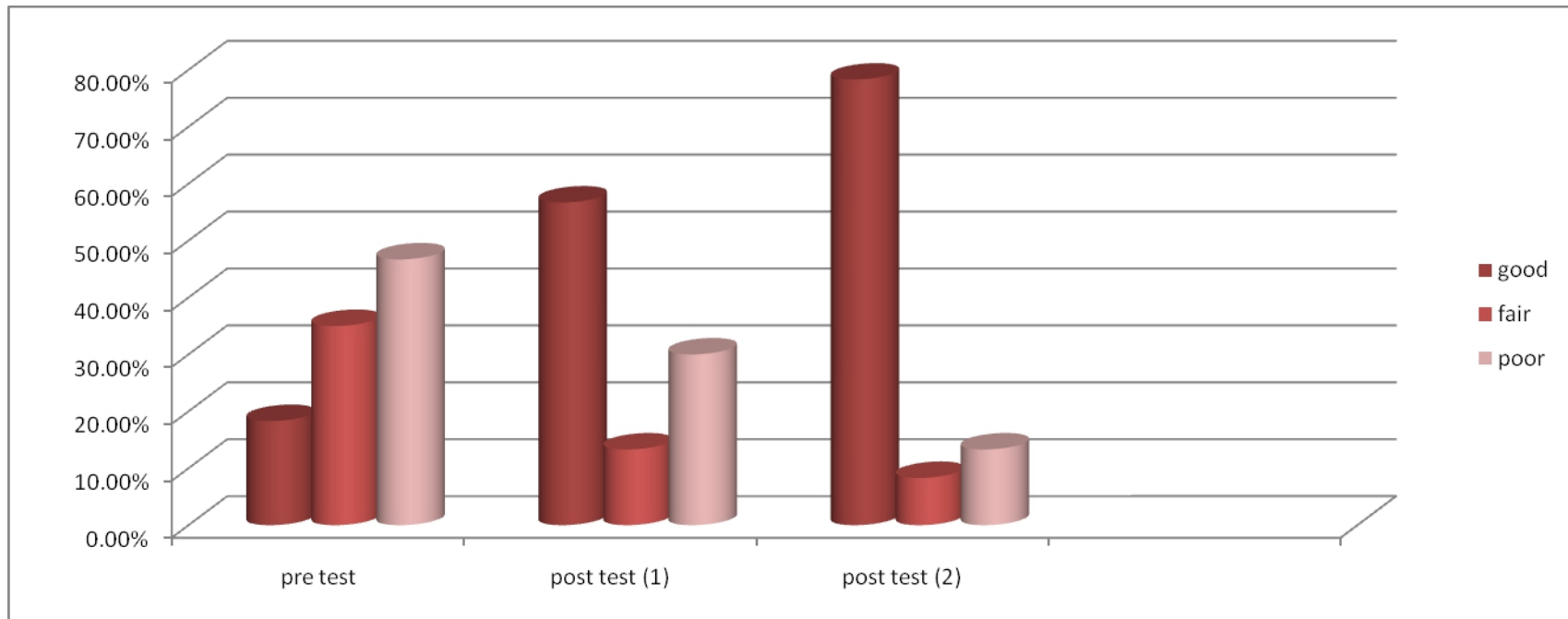
**Figure (3) demonstration of teaching about care of chest pain.**



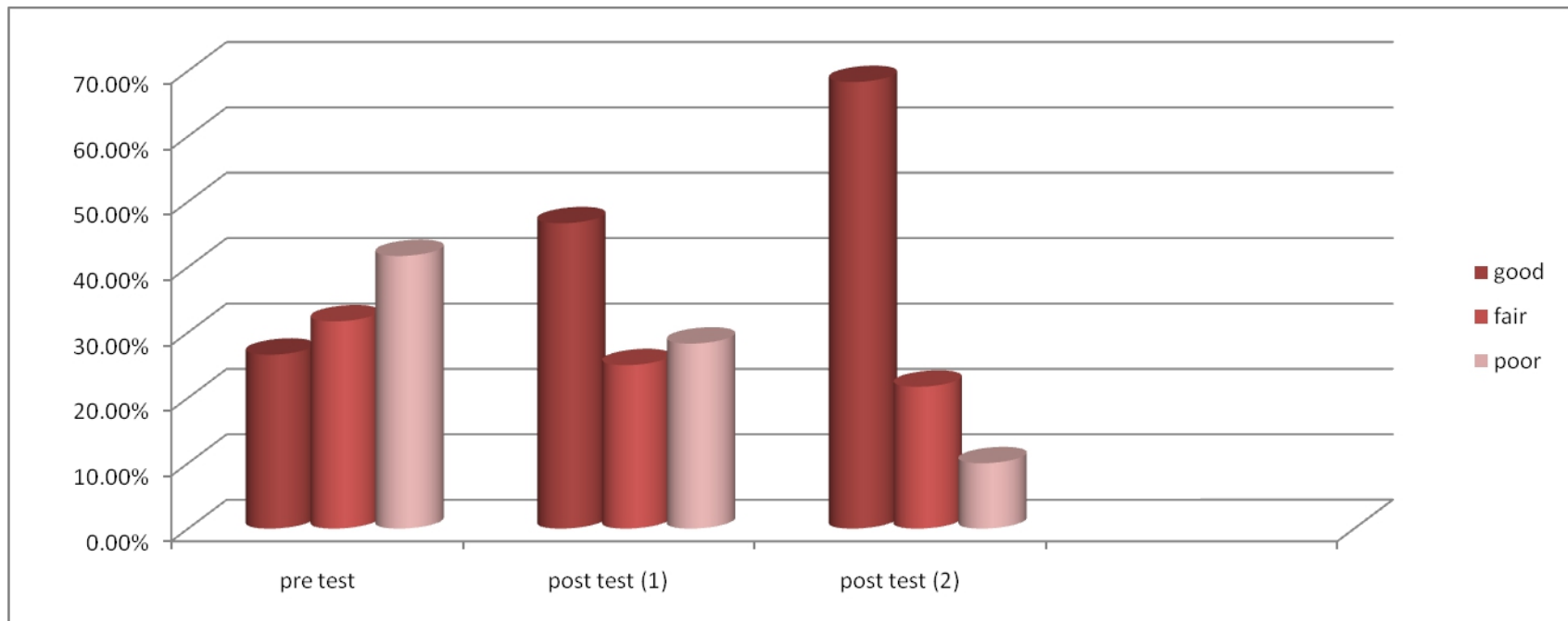
**Figure (4) demonstration of teaching about exercise.**



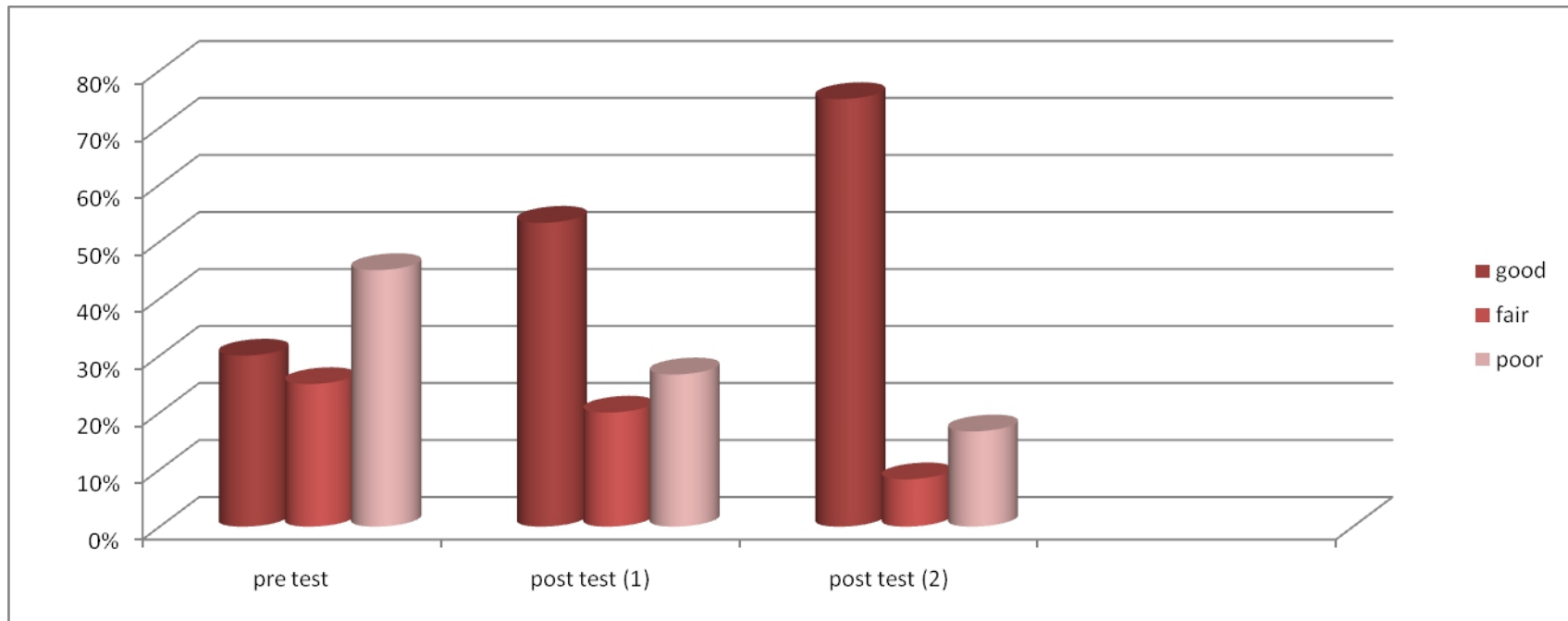
**Figure (5) application of teaching about nutrition.**



**Figure (6) demonstration of teaching about obesity.**

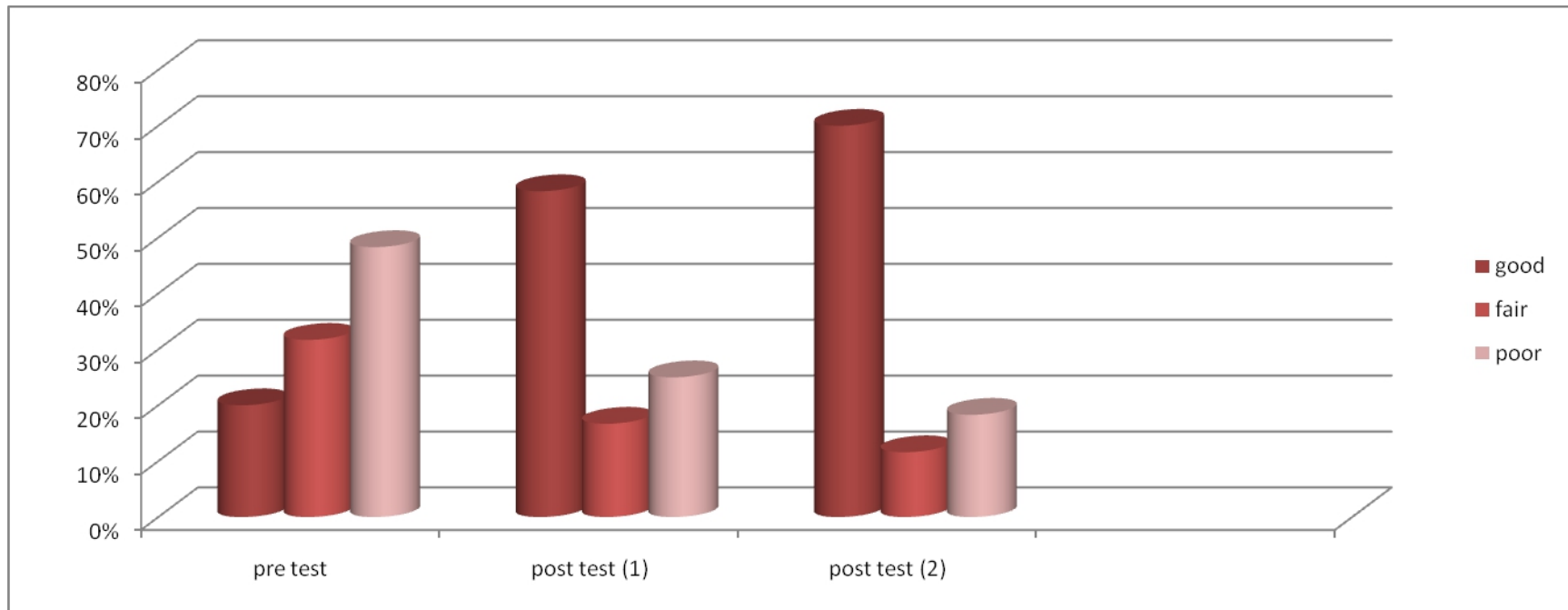


**Figure (7) application of education about hypertension and diabetes mellitus.**

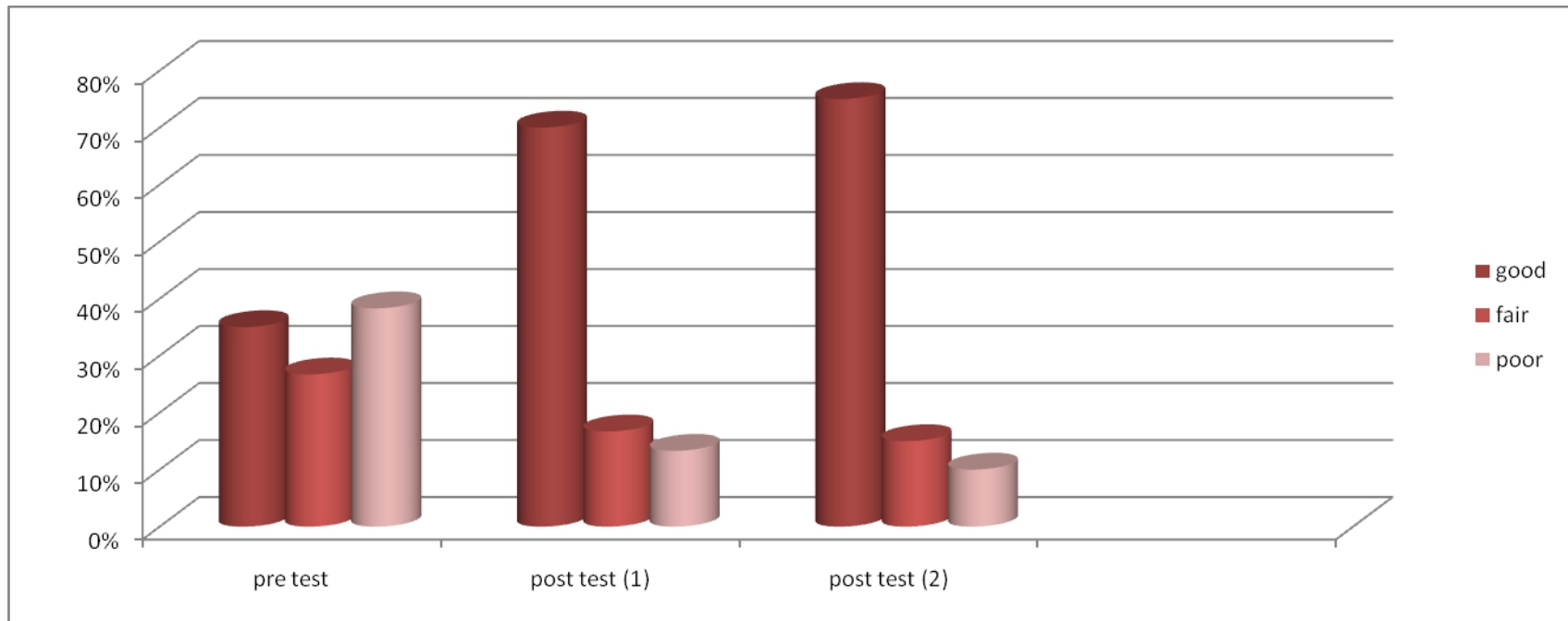


**Figure (8) demonstration of teaching about avoid smoking.**





**Figure (9) demonstration of teaching about improves emotional health.**



**Figure (10) performs teaching about medications compliance.**

**Table (1) demographic data of study sample:- N (60)**

<b>item</b>	<b>Study sample</b>	
	<b>N(60)</b>	<b>% ( 100% )</b>
<b>Gender :- Male</b>	6	10%
<b>Gender :- Female</b>	54	90%
<b>Age:- 20-40 year</b>	52	86.7%
<b>Age:- Above 40 year</b>	8	13.3%
<b>Experience:- Less than 2 year</b>	19	31.7%
<b>Experience:- 2-4 years</b>	30	50%
<b>Experience:- Above 4 years</b>	11	18.3%
<b>Previous training program</b>	26	43.3%
<b>No Previous training program</b>	34	56%

**Table (2) nurse's knowledge regarding CAD pre and post attending the educational program:-**

**N (60)**

Nurses knowledge	Pre test			Post test (1)			Post test (2)			p.value
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Chi square
<b>Definition of CAD</b>	17(28.3%)	19(31.7%)	24(40%)	45(75%)	11(18.3%)	4(6.7%)	48(80%)	8(13.3%)	4(6.7%)	0.234
<b>Non modifiable risk factors</b>	22(36.7%)	24(40%)	14(23.7%)	55(91.7%)	3 (5%)	2(3.3%)	57(95%)	2(3.3%)	1(1.7%)	0.000
<b>Modifiable risk factors</b>	25(41.7%)	11(18.3%)	24(40%)	40(66.7%)	4(6.7%)	16(26.7%)	45(75%)	2(3.3%)	13(21.7%)	0.001
<b>Clinical feature</b>	15(25%)	27(45%)	18(30%)	35(58.4%)	14(23.3%)	11(18.3%)	50(83.3%)	4(6.7%)	6(10%)	0.000
<b>Nursing assessment</b>	16(26.7%)	24(40%)	20(33.3%)	38(63.4%)	12(20%)	10(16.7%)	49(81.7%)	6(10%)	5(8.3%)	0.000
<b>Knowledge mean</b>	(31.7%)			(71%)			(83%)			

**Table (3) nurse's knowledge regarding management of CAD pre and post attending the educational program: - N (60)**

Nurses knowledge	Pre test			Post test(1)			Post test (2)			p.value
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	
<b>Pharmacological management</b>	22(36.7%)	15(25%)	23(38.3%)	48(80%)	7(11.7%)	5(8.3%)	51(85%)	6(10%)	3(5%)	0.000
<b>Types of Anticoagulants</b>	13(21.7%)	30(50%)	17(28.3%)	41(68.3%)	12(20%)	7(11.7%)	49(81.7%)	5(8.3%)	6(10%)	0.000
<b>Nursing diagnosis</b>	26(43.3%)	22(36.7%)	12(20%)	44(73.3%)	12(20%)	4(6.7%)	52(86.7%)	4(6.7%)	4(6.7%)	0.000
<b>Potential Complications</b>	17(28.3%)	24(40%)	19(31.7%)	49(81.7%)	8(13.3%)	3(5%)	50(83.3%)	8(13.3%)	2(3.3%)	0.002
<b>Nursing care</b>	22(36.7%)	23(38.3%)	15(25%)	53(88.3%)	5(8.3%)	2(3.3%)	57(95%)	3(5%)	0(0%)	0.005
<b>Knowledge mean</b>	(33.3%)			(78.3)			(86.3%)			

**Table (4) nurse's knowledge about self management program pre and post attending the educational program:-N (60)**

Nurses knowledge	Pre test			Post test (1)			Post test (2)			p.value
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	
<b>Definition of SMP</b>	15 (25%)	19(31.7%)	26(43.3%)	42(70%)	14(23.3%)	4(6.7%)	46(76.7%)	10(16.7%)	4(6.7%)	0.000
<b>Purposes of SMP</b>	10(16.7%)	17(28.3%)	33(55%)	34(56.7%)	11(18.3%)	15(25%)	43(71.7)	8(13.3%)	9(15%)	0.000
<b>Components of SMP</b>	14(23.3%)	25(41.7%)	21(35%)	44(73.3%)	9(15%)	7(11.7%)	47(78.3%)	7(11.7%)	6(10%)	0.000
<b>Design of SMP</b>	17(38.3%)	23(38.3%)	20(33.3%)	45(75%)	12(20%)	3(5%)	50(83.3%)	7(11.7%)	3(5%)	0.000
<b>Important of follow up</b>	18(30%)	30(50%)	12(20%)	53(88.3%)	5(8.3%)	2(3.3%)	55(91.7)	5(8.3%)	(0%)	0.000
<b>Knowledge mean</b>	(26.7%)			(72.7%)			(80.3%)			

**Table (5) nurse's knowledge about life style changes pre and post attending the educational program: - N (60)**

Nurses knowledge	Pre test			Post test (1)			Post test (2)			p.value
	good	fair	poor	good	Fair	poor	good	Fair	poor	
<b>Lifestyle changes</b>	13(21.7%)	20(33.3%)	27(45%)	38(63.3%)	13(21.7%)	9(15%)	48(80%)	7(11.7%)	5(8.3%)	0.000
<b>patient Readiness</b>	15(25%)	20(33.3%)	25(41.7%)	43(71.7%)	13(21.7%)	4(6.7%)	41(68.3%)	13(21.7%)	6(10%)	0.000
<b>Factors lead to pain</b>	11(18.3%)	18(30%)	31(51.7%)	40(66.7%)	8(13.3%)	12(20%)	46(76.7%)	10(16.7%)	4(6.6%)	0.927
<b>Action for symptoms</b>	15(25%)	23(38.3%)	22(36.7%)	29(48.3%)	17(28.3%)	14(23.3%)	47(78.3%)	6(10%)	7(11.7%)	0.000
<b>Knowledge mean</b>	(22.5%)			(62.5%)			(75.8%)			

**Table (6) nurse's knowledge about exercise pre and post attending the educational program:-**

**N (60)**

Nurses knowledge	Pre test			Post test (1)			Post test (2)			p.value
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	
<b>important of exercise</b>	17(38.3%)	22(36.7%)	21(35%)	32(53.3%)	18(30%)	10(16.6%)	45(75%)	11(18.3%)	4(6.7%)	0.000
<b>plan of exercise</b>	14(23.3%)	28(46.7%)	18(30%)	45(75%)	13(21.7%)	2(3.3%)	52(86.7%)	6(10%)	2(3.3%)	0.000
<b>Modification of exercise</b>	10(16.7%)	21(35%)	29(48.3%)	30(50%)	19(31.7%)	11(18.3%)	41(68.3%)	10(16.7%)	9(15%)	0.000
<b>Knowledge mean</b>	(26.1%)			(59.4%)			(76.7%)			



**Table (7) nurse's knowledge about nutrition pre and post attending the educational program:-**

**N (60)**

Nurses knowledge	Pre test			Post test (1)			Post test (2)			p.value
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	
<b>Nutrition teaching</b>	25(41.7%)	15(25%)	20(33.3%)	48(80%)	9(15%)	3(5%)	51(85%)	7(11.7%)	2(3.3%)	0.000
<b>Content of diet</b>	14(23.3%)	27(45%)	19(31.7%)	40(66.7%)	13(21.7%)	7(11.7%)	46(76.7%)	8(13.3%)	6(10%)	0.000
<b>Weight reduction</b>	18(30%)	22(36.7%)	20(33.3%)	42(70%)	16(26.7%)	2(3.3%)	47(78.3%)	9(15%)	4(6.7%)	0.000
<b>Knowledge mean</b>	(31.7%)			(72%)			(80%)			

**Table (8) nurse's knowledge about chronic diseases pre and post attending the educational program:-N (60)**

Nurses knowledge	Pre test			Post test (1)			Post test (2)			p.value
	good	fair	poor	good	Fair	poor	good	Fair	poor	
<b>hypertension</b>	20(33.3%)	18(30%)	22(36.7%)	38(63.3%)	20(33.3%)	2(3.3%)	44(73.3%)	11(18.3%)	5(8.3%)	0.062
<b>Diabetes mellitus</b>	16(26.6%)	25(41.7%)	19(31.7%)	41(68.3%)	13(21.7%)	6(10%)	48(80%)	8(13.3%)	4(6.7%)	0.000
<b>Knowledge mean</b>	(30%)			(65.8%)			(76.7%)			

**Table (9) nurse's knowledge about emotional health pre and post attending the educational program:- N (60)**

Nurses knowledge	Pre test			Post test (1)			Post test (2)			p.value
	good	fair	poor	Good	Fair	poor	good	Fair	poor	
<b>Improve emotional</b>	17(28.3%)	20(33.3%)	23(38.3%)	40(66.7%)	14(23.3%)	6(10%)	47(78.3%)	7(11.7%)	6(10%)	0.093
<b>reducing anxiety</b>	19(31.7%)	21(35%)	20(33.3%)	46(76.7%)	9(15%)	5(8.3%)	53(88.3%)	3(5%)	4(6.7%)	0.062
<b>Avoid Smoking</b>	15(25%)	29(48.3%)	16(26.7%)	36(60%)	16(26.7%)	8(13.3%)	45(75%)	9(15%)	6(10%)	0.000
<b>Knowledge mean</b>	(28.9%)			(67%)			(80.5%)			

**Table (10) nurse's knowledge about compliance of medications pre and post attending the educational program:- N (60)**

Nurses knowledge	Pre test			Post test (1)			Post test (2)			p.value
	good	fair	poor	good	Fair	poor	good	Fair	poor	
<b>compliance Important</b>	12(20%)	16(26.7%)	32(53.3%)	33(55%)	11(18.3%)	16(26.7%)	42(70%)	4(6.7%)	14(23.3%)	0.040
<b>Used of nitroglycerine</b>	17(28.3%)	36(60%)	7(11.7%)	42(70%)	15(25%)	3(5%)	44(73.3%)	13(21.7%)	3(5%)	0.005
<b>Side effect of nitroglycerine</b>	14(23.3%)	28(46.7%)	18(30%)	39(65%)	13(21.7%)	8(13.3%)	43(71.7)	12(20%)	5(8.3%)	0.000
<b>Inactivated nitroglycerine</b>	11(18.3%)	22(36.7%)	27(45%)	38(63.3%)	18(30%)	4(6.7%)	45(75%)	9(15%)	6(10%)	0.000
<b>Sub lingual nitroglycerine</b>	16(26.7%)	20(33.3%)	24(40%)	37(61.7%)	17(28.3%)	6(10%)	49(81.7%)	7(11.7%)	4(6.7%)	0.001
<b>bleeding precaution</b>	14(23.3%)	27(45%)	19(31.7%)	35(58.3%)	16(26.7%)	9(15%)	47(78.3%)	10(16.7%)	3(5%)	0.000
<b>Knowledge mean</b>	(23.6%)			(62.2%)			(75%)			

