

**An-Najah National University  
Faculty of Graduated Studies**

**Assessment of Myocardial Infarction Risk Among  
Patients in Nablus District.**

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**Dedication**

**To my beloved Family.**

**(Father, Mother, Brothers and Sisters).**

## **Acknowledgment**

**To my supervisors, Dr. Suleiman Al-Khalil and Dr. Jamal Al-Aloul. For their helping and improving of my study.**

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**Abbreviations:**

ACE\I: Angiotensin Converting Enzyme Inhibitor.

AHA: American Heart Association.

AMI: Acute Myocardial Infarction.

CPK: Creatine Phospho Kinase.

DM: Diabetes Mellitus.

HDL: High Density Lipoprotein.

KPA: Knowledge Attitude and Practice.

LDL: Low Density Lipoprotein.

MOH: Ministry Of Health.

SPSS: Statistical Package of Social Science.

STEMI: ST wave Elevated Myocardial Infarction.

WHO: World Health organization.

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**Abstract**

The idea of assessment of myocardial infarction risk factors among patients comes while more and more patients in Palestine are dying from accelerated cardiovascular disease.

While myocardial infarction has been described to have an epidemic-like spread all over the world with special emphasis on countries experiencing the transition to western lifestyle, it is important to evaluate the life style and behaviors of those patients after the onset of myocardial infarction.

The risk factors of myocardial infarction among patients life in Nablus district were assessed. About 150 patients were selected randomly from Nablus community to participate in this study (108 Male, 42 Female). Those are patients with myocardial infarction selected from three main hospitals in Nablus city. Al-Watani hospital (MOH) n=50, Nablus specialty hospital, (private sectors) n=50, and CCU unit in Al-Arabi hospital, (private sectors). n=50.

Microsoft Excel and SPSS software were used to analyze the data collected and to obtain results.

Most of sample study participants were more than 50 years old. The majorities of participants live in Nablus city, finished their secondary level of education and had no university degree level.

The results according to the gender were

64.81% of males and 66.67% of females of the study sample were diabetic, and 80.56% of males and 71.42% of female of the study sample were hypertensive, while 59.26% of males and 64.29% of females of the study sample relatives had cardiac diseases.

All participants were surveyed for diet, physical activity, smoking, stress, knowledge, attitude, practice, and drugs compliance. They were also tested for blood pressure, FBS, cholesterol, triglyceride, HDL, LDL, weight, length, and BMI.

Most of patients have no physical activity (86% of males and 98% of females), no control diet (65% of males and 48% of females), while percent of smoking patients were high according to their health situation (60% of males and 21% of females), they also had impaired fasting blood sugar, and high fasting lipids.

The political and economical situations of Patients in Nablus city, and lack of health education among patients and their families, were the major reason of the lifestyle impairment.

Patients who survived acute myocardial infarction need more attention and rehabilitation programs, this needs the efforts of both primary health care physicians and cardiologists.

**Chapter One.**

**(Introduction).**

## **1. Introduction:**

### **1.1 Myocardial infarction. (MI):**

Myocardial infarction (MI) is multifactorial, progressive, and complex disease, means that part of the heart muscle suddenly loses its blood supply. Without prompt treatment, this can lead to damage to the affected part of the heart. It sometimes called a heart attack or coronary thrombosis.

World Health Organization in 1979, state that a myocardial infarction has occurred when two of the following three criteria are met: symptoms consistent with ischemia, or decreased blood flow to the heart; changes in an Electrocardiogram; and elevated enzymes—most commonly, one called CK-MB.

In September 2000, a new, widely accepted definition of myocardial infarction was introduced—a definition developed by a joint committee of the European Heart Society and the American College of Cardiology. The most significant change is that the definition adds cardiac troponin, a protein found only in heart muscle tissue, to the measures already used to determine whether or not a myocardial infarction has occurred.

Like any other muscle, the heart muscle needs a good blood supply. The coronary arteries take blood to the heart muscle. The main coronary arteries branch off from the aorta. (The aorta is the large artery which takes oxygen-rich blood from the heart chambers to the body.) The main coronary arteries divide into smaller branches which take blood to all parts of the heart muscle.

The known pathological processes affecting the heart are generally classified into one of the four general categories listed below:

1. Ischemic heart diseases.
2. Cardiomyopathy.
3. Congenital and valvular heart disease.

### **1.2 Ischemic heart disease (IHD):**

Ischemia is a condition in which an organ has a blood supply that is inadequate to maintain its essential functions. There are many causes of myocardial ischemia, but the most common cause by far is coronary atherosclerosis. This condition can develop over many years, sometimes even beginning in childhood, as the arteries supplying blood to the heart gradually narrow because of deposition of cholesterol and other material in the arterial wall. Coronary vasospasm can also produce ischemia. In coronary vasospasm the arterial wall constrict in an abnormal and prolonged fashion because of super sensitivity to normal vasoconstrictor signals. Other less common causes of myocardial ischemia are inflammation of coronary arteries, thrombosis (blood clot), severe anemia, and severe hypotension. (Lawrence A. Kaplan, 1984)

If patient has an MI, a coronary artery or one of its smaller branches is suddenly blocked. The part of the heart muscle supplied by this artery loses its blood (and oxygen) supply. This part of the heart muscle is then at risk of damage unless the blockage is quickly undone. (Strictly speaking, 'infarction' means death of some tissue due to a blocked artery which stops blood from getting past.)

If one of the main coronary arteries is blocked, a large part of the heart muscle is affected. If a smaller branch artery is blocked, a smaller amount of heart muscle is affected. In people who survive an MI, the part of the heart muscle which dies ('infarcts') is replaced by scar tissue over the next few weeks.

The seriousness often depends on the size and site of the area of heart muscle that is damaged. In many cases only a small amount of damage occurs which heals as a small patch of scar tissue. The heart can often function normally with a small patch of scar tissue. A larger MI is more likely to be life-threatening or cause complications.

Heart attacks strike both men and women. However, some persons are more likely than others to have a heart attack. Some of the risk factors for heart attack are beyond our control, but most can be modified to help us lower our risk of having a first-or repeat-heart attack.

### **1.3. Factors that increase the risk of a heart attack:**

Risk factors for serious disease and mortality in people have been documented in observational studies. The individual contributions of cigarette smoking, diabetes and hypertension have been noted in the clinical sphere, other factors, such as self-related health, physical disability, marital status, social support and physical activity, have been noted in the sociodemographic sphere.

#### **1.3.1 Factors you cannot control:**

- Pre-existing coronary heart diseases, including:

1. A previous heart attack.

## 2. A prior angioplasty or bypass surgery.

- Age.

Men: The risk increases after age 45

Women: The risk increases after age 55.

- Heredity.

Family history of early heart disease-a father or brother diagnosed before age 55; or a mother or sister diagnosed before age 65.

### **1.3.2 Factors you can control:**

#### **1.3.2.1 Smoking:**

Cigarette smoking greatly increases the risk of fatal and nonfatal heart attacks in both men and women. It also increases the risk of a second heart attack among survivors. Women who smoke and use oral contraceptives have an even greater risk than smoking alone. The good news is that quitting smoking greatly reduces the risk of heart attack. One year after quitting the risk drop to about one-half that of current smokers and gradually returns to normal in persons without heart disease. Even among persons with heart disease, the risk also drops sharply one year after quitting smoking and it continues to decline over time but the risk does not return to normal. (Mansoor Ahmed, Dad Jan Baloch.2003).

#### **1.3.2.2 High blood pressure. (Hypertension):**

High blood pressure makes the heart work harder. It increases the risk of developing heart disease, as well as kidney disease and stroke.

lose excess weight; become physically active; follow a heart healthy eating plan, including foods lower in salt, help prevent or control high blood pressure, and, if a medication was prescribed, compliance is required.( Leon A Simons, Judith Simons, 2005).

### **1.3.2.3 High blood cholesterol:**

The level of cholesterol in the bloodstream greatly affects the risk of developing heart disease. The higher the level of blood cholesterol, the greater the risk for heart disease or heart attacks.

When there is too much cholesterol (a fat-like substance) in the blood, it builds up in the walls of arteries. Over time, this buildup causes arteries to become narrowed, and blood flow to the heart is slowed or blocked. If the blood supply to a portion of the heart is partially or completely cut off, a heart attacks results.

Various factors affect cholesterol levels: diet, weight, physical activity, age, gender, and heredity.

High cholesterol is treated with lifestyle changes-a heart healthy eating plan, physical activity, and loss of excess weight-and, if those do not lower it enough, Medications include statins, bile acid sequestrants, nicotinic acid, and fibric acids. (AHA, 2006).

### **1.3.2.4 Overweight and obesity:**

Obesity is an important determinant of cardiovascular disease. Obese children have an elevated risk of developing cardiovascular disease in adulthood. The effects of obesity on cardiovascular health and disease are many, one of the most profound of which is hypertension.

Obesity has a strong effect on lipoprotein metabolism regardless of ethnic group. Increased weight is a determinant of higher levels of triglycerides, elevated LDL-C, and low HDL-C. Conversely, weight loss is associated with a healthier lipoprotein profile in both men and women: triglycerides decrease, HDL-C increases, and LDL-C decreases. “The public health approach (to obesity) requires a systematic education of the public about the dangers of obesity. Various health agencies could work together to promulgate such a message that would reach all population groups.” (Krauss, RM, Obesity, Impact on Cardiovascular Disease, Circulation, 2005).

### **1.3.2.5 Measures that assess whether or not a person is overweight are:**

#### **1. Body mass index (BMI):**

Body mass index (BMI) is a measure of body mass based on height and weight that applies to both adult men and women.

#### **Metric Formula**

Body Mass Index can also be calculated using kilograms and meters (or centimeters).

$$\text{BMI} = \text{WEIGHT IN KILOGRAMS}/(\text{HEIGHT IN METERS})^2$$

For example, a person who weights 99 Kilograms and is 1.905 Meters (190 centimeters) tall has a BMI of 27.5.

**Table (1.1) BMI Categories** according to AHA2006

• Normal weight	18.5-24.9
• Overweight	25-29.9
• Obesity	BMI of 30 or greater

## **2. Waist Circumference:**

Waist can be determined by placing a measuring tape snugly around patient waist. It is a good indicator of abdominal fat which is another predictor for developing risk factors for heart disease and other diseases. This risk increases with a waist measurement of over 40 inches in men and over 35 inches in women.

We can control obesity by changing lifestyle. It combines a hearty-healthy, low-calorie, nutritious eating plan with regular physical activity. (AHA, 2005).

### **1.3.2.6 Physical inactivity:**

The risk of heart attack increases if you are physically inactive or you lead a sedentary lifestyle, (Osama Ishtia 2002). Physical activity improves cholesterol levels, helps control high blood pressure and diabetes, and keeps weight under control. It also increases physical fitness, promotes psychological well-being and self-esteem, and reduces depression and anxiety. Thus exercise and physical activity provides multidimensional benefits, (Donctrin M Kart JD, 1984).

Those who have already had a heart attack also benefit greatly from being physically active.

Starting slowly to increase physical activity, and to check with health care provider before starting a physical activity program. This is especially important among patient over age 55, have been inactive, or have diabetes or another medical problem.

### **1.3.2.7 Diabetes:**

Patients with diabetes have a higher case fatality rate in myocardial infarction (MI) or stroke than those without diabetes: that is, MI and stroke are more often fatal if diabetes is present.

Diabetes mellitus damages blood vessels, including the coronary arteries of the heart. Up to 75 percent of those with diabetes develop heart and blood vessel diseases. Diabetes also can lead to stroke, kidney failure, and other problems, (Leon A Simons, Judith Simons,).

Research shows that the same steps that reduce the risk of heart disease also lower the chance of developing type 2 diabetes. And, for those who already have diabetes, those steps, along with taking any prescribed medication, can also delay or prevent the development of complications of diabetes, such as eye disease and nerve damage.

### **1.4 Other risk factors:**

1. Use of birth control pills, cocaine, or amphetamines may also increase chances for a heart attack.
2. Certain psychological factors, listed below, have been linked to heart attacks and a worse outcome from a heart attack:
  - a. Depression
  - b. Anger and hostility
  - c. Social isolation and lack of social support
  - d. Chronic (ongoing) stress

Stress can come from any situation or thought that makes you feel frustrated, angry, or anxious. What is stressful to one person is not necessarily stressful to another.

Stress is a normal part of life. In small quantities, stress is good -- it can motivate you and help you be more productive. (AHA, 2006). However, too much stress, or a strong response to stress, is harmful. It can set you up for general poor health as well as specific physical or psychological illnesses like infection, heart disease, or depression. (AHA, 2006). Persistent and unrelenting stress often leads to anxiety and unhealthy behaviors like overeating and abuse of alcohol or drugs.

Anxiety is a feeling of apprehension or fear. The source of this uneasiness is not always known or recognized, which can add to the distress you feel.

Anxiety is often accompanied by physical symptoms, including:

- Twitching or trembling
- Muscle tension, headaches
- Sweating
- Dry mouth, difficulty swallowing
- Abdominal pain (may be the only symptom of stress, especially in a child)
- Dizziness
- Rapid or irregular heart rate

- Rapid breathing
- Diarrhea or frequent need to urinate
- Fatigue
- Irritability, including loss of your temper
- Sleeping difficulties and nightmares
- Decreased concentration
- Sexual problems

A poor diet can also contribute to stress or anxiety -- for example, low levels of vitamin B-12. Performance anxiety is related to specific situations, like taking a test or making a presentation in public. Posttraumatic stress disorder (PTSD) develops after a traumatic event like war, physical or sexual assault, or a natural disaster.

The most effective solution is to find and address the source of stress or anxiety. Unfortunately, this is not always possible. A first step is to take an inventory of what you think might be making you "stress out":

- What do you worry about most?
- Is something constantly on your mind?
- Does anything in particular make you sad or depressed?

Then, find someone you trust (friend, family member, neighbor) who will listen to you, and talking to a friend or loved one needed to relieve anxiety.

Also, find healthy ways to cope with stress. For example:

- Eat a well-balanced, healthy diet. Don't overeat.
- Get enough sleep.
- Exercise regularly.
- Limit caffeine and alcohol.
- Don't use nicotine, cocaine, or other recreational drugs.
- Learn and practice relaxation techniques like guided imagery, progressive muscle relaxation,
- Take breaks from work. Make sure to balance fun activities with your responsibilities. Spend time with people you enjoy.

### **1.5 Lifestyle:**

Attending cardiac rehabilitation following a heart attack can significantly improve many of risk factors for heart disease, including high cholesterol, high blood pressure, extra weight, high homocysteine, and elevated C-reactive protein. This improvement, in turn, lowers chances for repeat heart attacks. Cardiac rehabilitation programs generally involve comprehensive education on diet, physical activity, and relaxation with participation in a supervised exercise and stress reduction program, (Fajans SS, 1982).

To maintain the positive effects on both your risk factors and your heart, you must continue to follow the healthy habits taught in cardiac

rehabilitation, like exercise and eating properly, beyond the structured program (which usually lasts 3 months). (Kamal Dumadi, 2000)

### **1.6. Symptoms\_of Heart Attack:**

If the patients have never been diagnosed with heart diseases but develop any of the following symptoms:

1. Chest pain that comes with physical exertion and eases with rest.
2. Chest pain that is brought on by emotional stress.
3. New or unusual shortness of breath, winded after climbing a flight of stairs.
4. Indigestion, particularly if indigestion is unusual, if it does not respond to antacids, or if not associate its occurrence with eating. Many of the symptoms of heart attack can be brought on by digestive disturbances or other less serious conditions. Heart attacks may vary from person to person, and from heart attack to heart attack. Women, for example, may experience "atypical" symptoms such as pain between the shoulder blades rather than crushing chest pain. This may result in them delaying seeking treatment. That is a great mistake.
5. Dizziness can be an early symptom of heart attack, Cardiac chest pain is often vague, or dull, and may be described as a pressure or band-like sensation, squeezing, heaviness, or other discomfort.

A heart attack often starts with mild symptoms that may not be painful. Many victims experience a tightness or squeezing sensation in the chest.

## **1. 7. Classifications of coronary heart diseases:**

### **1.7.1 Nonfatal events:**

#### A. Definite MI:

1. Evolving diagnostic ECG, or
2. Diagnostic biomarkers

#### B. Probable MI:

1. Positive ECG findings plus cardiac symptoms or signs plus missing biomarkers, or
2. Positive ECG findings plus equivocal biomarkers

#### C. Possible MI:

1. Equivocal biomarkers plus nonspecific ECG findings,  
or
2. Equivocal biomarkers plus cardiac symptoms or signs,  
or
3. Missing biomarkers plus positive ECG

#### D. Unrecognized MI:

1. Appearance, in a non-acute setting, of a new diagnostic Q wave with or without ST-T-wave depression, or ST elevation.

E. Medical procedure-related event:

1. May be reported separately as procedure-related cardiac events or combined with overall event rates
2. If the medical procedure was performed for the treatment of acute ischemia (e.g., angioplasty, coronary bypass surgery), an event should be classified as described above (A–C) and not considered procedure-related

F. Unstable angina pectoris:

G. Stable angina pectoris:

1. Cardiac symptoms in a pattern that remains constant in presentation, frequency, character, and duration over time.

**1.7.2 Fatal events (hospitalized patients):**

A. Definite fatal MI:

1. Death within 28 days of hospital admission in MI cases defined in I.7.1.A
2. Postmortem findings consistent with MI within 28 days

B. Probable fatal MI:

1. Death within 28 days of hospital admission in cases defined in I.7.1B
2. Death within 6 hours of hospital admission with cardiac symptoms and/or signs. Other confirmatory data (biomarkers, ECG) are absent or not diagnostic.

C. Possible fatal coronary event:

1. Death within 28 days of hospital admission in cases defined in (I.7.1C, I.7.1F, and I.7.1G).
2. Postmortem findings show old infarct and/or  $\geq 50\%$  atherosclerotic narrowing of coronary arteries.

**1.8. Disability due to cardiovascular diseases:**

Common cardiovascular disorders are severe enough to prevent a person from engaging in gainful activity. The degree of recovery from cardiac insult, the level of the individual's functioning, and the frequency, severity, and duration of symptoms. Also, several listings include a requirement for continuing signs and symptoms despite a regimen of prescribed treatment.

Impairments resulting from cardiovascular disease based on symptoms, physical signs, laboratory test abnormalities, and response to a regimen of therapy prescribed by a treating source.

A longitudinal clinical record covering a period of not less than 3 months of observations and therapy is usually necessary for the assessment of severity and expected duration of cardiovascular impairment, unless the

claim can be decided favorably on the basis of the current evidence. All relevant evidence must be considered in assessing disability.

Cardiovascular impairment results from one or more of four consequences of heart disease:

1. Congestive symptoms or ventricular dysfunction symptoms.
2. Discomfort or pain due to myocardial ischemia, with or without necrosis of heart muscle.
3. Syncope, or near syncope, due to inadequate cerebral perfusion from any cardiac cause such as obstruction of flow or disturbance in rhythm or conduction resulting in inadequate cardiac output.
4. Central cyanosis due to right-to-left shunt, arterial desaturation, or pulmonary vascular disease.

Impairment from diseases of arteries and veins may result from disorders of the vasculature in the central nervous system, eyes, kidney, and other organs.

### **1.9. How Can Plaques Cause Sudden Heart Attacks?**

A heart attack occurs suddenly without much warning. But the coronary artery disease, the underlying cause for the heart attack, had been brewing for many years. So, what happened to cause the sudden heart attack?

For many years, researchers thought that the cause of the heart attack was a large plaque that formed on the wall of the coronary artery. This plaque was known to cause heart attack because it makes the heart to work

too hard. Blockage can be observed with a coronary angiogram. It was suggested that a small blood clot becomes wedged at the site of the plaque. This clot suddenly blocks blood flow completely through the coronary artery resulting in a heart attack.

Researches had shown that most heart attacks are caused by rupture of the plaque, and that small plaques are often responsible.

It is not important how big the plaque is. What matters, at least for proneness to precipitate heart attacks, and how the plaque is built?

All plaques have a fatty core covered with a top composed of a meshwork of fibers.

If the top covering on the plaque is thick and the core is small, dry, and hard, the plaque is "stable" and is unlikely to rupture. Big plaques are often stable.

However, if the top covering of the plaque is thin and if the core is filled with soft, fatty material, the plaque is "unstable" and can rupture or break. When the top ruptures, the blood in the artery comes in contact with the fatty material in the core of the plaque. This results in the formation of a big clot at the site of the rupture. This clot, in turn, can suddenly stop blood flow in the artery, resulting in a heart attack. What is interesting is that the so-called "vulnerable plaques" with thin tops and soft fatty cores may be small. It may not block blood flow or cause any symptoms such as angina. They may even be so small that they cannot be seen on a coronary angiogram. The cause of the "plaque rupture" is largely unknown, but contributing factors may include cigarette smoking, elevated LDL

cholesterol, elevated levels of blood catecholamine (adrenaline), high blood pressure, and other mechanical and biochemical forces.

### **1.10. Medication:**

The following Medications are commonly prescribed:

- ❖ Aspirin reduces the 'stickiness' of blood which reduces the risk of blood clots forming.
- ❖ Clopidogrel is an alternative to aspirin which helps to prevent blood clots. It is usually used in people who are not able to take aspirin.
- ❖ A beta-blocker slows the heart rate and reduces the risk of abnormal heart rhythms.
- ❖ An ACE/I (angiotensin converting inhibitor) reduces the risk of heart failure and further MI.
- ❖ A cholesterol lowering medicine.

Every person is different and medication may vary depending on other things such as have complications or other diseases.

### **1.11. Complications of Acute Myocardial Infarction:**

#### **1.11.1 Early Complications:**

##### **1.11.1.1 Failure of reperfusion:**

Reperfusion should reduce ST elevation to less than 50% within one hour. Persisting ischemia is increasingly regarded as an indication for

percutaneous angioplasty. Reinfarction occurs in 5-30% of patients after fibrinolytic therapy. It is more common in patients with diabetes or history of previous myocardial infarction. Recurrent infarction (infarction in a different artery) within 48 hours may occur in up to 40% of patients.

#### **1.11.1.2 Arrhythmias:**

Arrhythmias may be caused by infarction, reperfusion, toxic metabolites, and irritable myocardium, metabolic (especially potassium or magnesium imbalance). Some patients exhibit reperfusion arrhythmias (ventricular tachycardia, idioventricular rhythm, and, rarely, ventricular fibrillation) which are usually malignant and require therapy.

#### **1.11.1.3 Left ventricular dysfunction and heart failure:**

Pulmonary edema sometimes follows a myocardial infarction. It usually responds well to diuretics. The severity of the heart failure depends on the extent of the infarction and the presence of any other complications, e.g. acute mitral regurgitation. Treatment with ACE inhibitors or angiotensin receptor antagonists improve both short-term and long-term prognosis.

#### **1.11.1.4 Cardiogenic shock:**

Occurs in 5-20% of patients following myocardial infarction. Initial treatment is with a combination of inotropes, vasodilators, and loop diuretics. Percutaneous revascularization is associated with an improved prognosis. Aggressive treatment with intra-aortic balloon pumping followed by surgical revascularization may also significantly reduce

mortality. The mortality rate is over 70% if revascularization is not possible. (Blue Book- January 2005).

#### **1.11.1.5 Pericarditis:**

Pericarditis is most common following an anterior infarction. The frequency is reduced with early reperfusion in the acute management of infarction. Frequently occurs within a few days of the myocardial infarction and presents with a low grade fever, pericardial friction rub and pleuritic chest pain. ECG may show ST elevation in all leads without reciprocal ST depression.

#### **1.11.1.6 Ventricular rupture and Ventricular septal defect:**

Ventricular rupture occurs in the interventricular septum or the wall of the left ventricle. Both have mortality rates greater than 90%. Rupture usually occurs 3-5 days (but may be up to 3 weeks) after an infarction. Ventricular rupture is more common in women, hypertension, and those receiving non-steroidal anti-inflammatory drugs or steroids. Rupture of a free wall causes bleeding into the pericardium, leading to cardiac tamponade, with progressively poorer cardiac function. Rupture is usually within several days after infarction but may be up to two weeks after. Death is usually immediate. Emergency pericardiocentesis and cardiac surgery are essential for any hope of survival. Occasionally, partial rupture of the free wall may cause a false aneurysm.

#### **1.11.1.7 Acute mitral regurgitation:**

Most common with an infero-posterior infarction and may be due to ischemia, necrosis, or rupture of the papillary muscle. Most mitral

regurgitation following infarction is transient and asymptomatic. It is often accompanied by a pansystolic murmur, but the murmur may be inaudible if left atrial pressure rises sharply. Echocardiogram is required to confirm the diagnosis, especially to differentiate from rupture of the interventricular septum, and to assess severity. The management is acute surgical repair with or without revascularization.

#### **1.11.1.8 Right ventricular failure:**

Mild right ventricular dysfunction is common after infero-posterior infarcts but right heart failure only occurs in 10% of these patients. Diagnosis is by echocardiography. Nitrates, diuretics and any other drugs that reduce preload should be avoided. Management is focused on maintaining adequate right and left ventricle filling with fluids. Positive inotropes such as dobutamine may be required.

#### **1.11.2 Late Complications:**

##### **1.11.2.1 Deep vein thrombosis.**

##### **1.11.2.2 Pulmonary embolism.**

##### **1.11.2.3 Mural thrombosis and systemic embolism:**

Left ventricular thrombus occurs in 20% post infarction but in up to 60% of those after a large anterior infarction. The thrombus may be large and is associated with risks of embolisation in 15-20% of cases. Treatment is anticoagulation with heparin followed by warfarin, along with thrombolysis and/or surgical repair. (Blue Book- January 2005).

**1.11.2.4 Left ventricular aneurysm:**

Occur after 2-15% of infarcts. Five year survival is 10-25%. May be clinically silent or cause recurrent tachyarrhythmias, heart failure or systemic emboli. ECG may show persistently raised ST segments and chest x-ray may show cardiomegaly with an abnormal bulge on the left heart border. Diagnosis is made by echocardiography, MRI or CT scan. Treatment is with anticoagulation. Refractory heart failure and ventricular arrhythmias are indications for surgery. (Blue Book- January 2005)

**1.11.2.5 Dressler's syndrome:**

Dressler's syndrome presents as pericarditis, often accompanied by pleural and pericardial effusions, developing between 2 weeks and 3 months after acute infarction or heart surgery. Is thought to have an autoimmune mechanism. The frequency is reduced with early reperfusion in the acute management of infarction. Initial treatment is with non-steroidal anti-inflammatory drugs. Steroids are indicated if symptoms are severe or when repeated drainage of a pericardial effusion is necessary.

**1.11.2.6 Depression:**

Significant depression occurs in about 20% of patients following myocardial infarction.

All of these complications can be reduced among patients with myocardial infarction if they give attention to the metabolic syndrome, this can be achieved if they change their lifestyle (avoid or manage the controllable risk factors).

## **1.12. Epidemiology of disease:**

### **1.12.1 Internationally:**

Cardiovascular diseases account for 12 million deaths annually throughout the world. MI continues to be a significant problem in industrialized countries and is becoming an increasingly significant problem in developing countries.

Mortality/Morbidity: Approximately 500,000-700,000 deaths are caused by ischemic heart disease annually in the United States.

One third of patients who experience STEMI will die within 24 hours of the onset of ischemia and many of the survivors will suffer significant morbidity. For many patients, the first manifestation of coronary artery disease is sudden death likely from malignant ventricular dysrhythmia.

More than one half of deaths occur in the prehospital setting.

In-hospital fatalities account for 10% of all deaths. An additional 10% of deaths occur in the first year post infarction.

A steady decline has occurred in the mortality rate from STEMI over the last several decades. This appears to be due to a combination of a fall in the incidence of MI (replaced in part by an increase in the incidence of unstable angina) and a reduction in the case-fatality rate once an MI has occurred.

Age: MI occurs most frequently in persons older than 45 years.

Certain subpopulations younger than 45 years are at risk, particularly cocaine users, insulin-dependent diabetics, patients with

hypercholesterolemia, and those with a positive family history for early coronary disease. A positive family history includes any first-degree male relative aged 45 years or younger or any first-degree female relative aged 55 years or younger who experienced a myocardial infarction. In younger patients, the diagnosis may be hampered if the physician does not maintain a high index of suspicion. (Medicine website, 2005).

### **1.12.2 United States:**

Annually, approximately 1.5 million acute myocardial infarctions occur in the United States. Of these, approximately 500 thousand result in death, (Med Help International, 1996).

In 1981 approximately 800,000 Americans suffered their first heart attacks. Of these about 350,000 died. They did not get a second chance. But the remaining 450,000 were given a second chance.

Thousands of victims get a second chance after a heart attack. However, about 600,000 people a year suffer a second or third or fourth heart attack, and about 300,000 of them die as a result, (Med Help International, 1996).

An analysis of the hospital discharge and death certificate data for the State of California in 1994 shows that about 78% of identified myocardial infarction victims survive. Since the database identifies cases and not individuals, it is likely that the survivor segment includes some individuals who experienced multiple MIs during the year. This has the effect of somewhat understating the fatality rates. Of the MI victims who do not survive approximately 42% of deaths occur in a hospital after the patient

has been admitted. Of those remaining, 20% occur in a hospital emergency room or are dead on arrival (DOA, 2004).

### **1.12.3 In Palestine:**

The demographic and health situation of Palestine since year 2001 is unique. Palestine is undergoing a dual faceted epidemiological transition similar to that of middle-income countries. Disease patterns are characterized by diseases typical of developing countries like (respiratory infections, diarrhea, and parasitic diseases), and diseases of developed countries like (ischemic heart disease, hypertension, cancer, and diabetes), (Majed Abu-Ali, 2003).

Reliable data about mortality and morbidity in Palestine are lacking, and the current health information system (HIS) is inadequate and lacks standard operations both at regional and international levels, (National Health Plan 1999-2003). The presence of two region, (West bank and Gaza strip) under control of Palestinian National Authority (PNA) is one of the major problems faced Palestinian Planer and HIS. (The impact on Palestinian Economy of Confrontations, 2001)

Studies focused on Lifestyle factors relevant to coronary risk factors show differ between Palestinian communities. They have been exposed, albeit differently, to the stressors of the long-term conflict.

According to the WHO 1998, the health situation in Palestine is probably similar to Egypt, Syria, and Jordan since many of risk factors are similar, (Zynia L. 2000).

There are little data available on the rates of occurrence, risk factors and mortality due to acute myocardial infarction among the various ethnic groups living in Palestinian territories. hypertension and heart diseases, at a rate which almost the same as that reported in the neighboring countries before year 2001.

**Table (1.2)** Cardiovascular disease mortality indicators.

<b>All heart diseases</b>	<b>55.8*</b>
<b>Rheumatic heart disease</b>	<b>1*</b>
<b>Ischemic heart disease</b>	<b>35*</b>
<b>Other heart diseases</b>	<b>17.9*</b>

(MOH, health status in Palestine, 2003).

\*Mortality rate per 100, 000 of cardiovascular diseases.

Heart diseases are the first leading cause of death among general population, and there are 2,087 persons died among both sexes with a proportion of 30, 5 % male and 23.1 % in female.

Ischemic heart diseases are the leading cause of cardiovascular mortality (33.7%) and of all cardiovascular disease (81.5%), with a rate of 35 per 100,000 populations.

Coronary risk appears to be particularly high among Palestinian communities. Determinants of these unexpected findings should be sought and prevention programmes initiated.

Recent statistics indicate that acute myocardial infarction (AMI) is becoming very common in Palestine

There is scope for lifestyle change in reducing AMI risk, by changes in physical activity, smoking and dietary habits. In addition, measures to control hypertension and diabetes should be given a high priority in any

national health policy to prevent AMI. (Community Health Department, 1995).

### **1.13 Life after heart attack:**

Survival of a heart attack is no free ticket to a long life. However, it can be. Risk factors need to be modified, drugs sometimes have to be taken, and surgery is indicated at times. Complementary therapy can be very useful.

The risk of having a second heart attack can be sharply reduced. The evidence comes from several clinical studies. Studies have shown that, in some cases, the death rate was reduced by 26 percent among heart attack victims who took steps to prevent another attack.

### **1.14 Getting Back Into Life after a Heart Attack**

Most people can return to work and the activities they enjoy within a few months of having a heart attack. Others may have to limit their activity if the heart muscle is very weak. The amount of activity they can do will be based on the condition of their heart, (KING H, 1998).

### **1.15 Develop a recovery plan after heart attack:**

1. Start slowly for the first few days after heart attack.
2. May need to rest and let heart heal. As heart heals,
3. Now ready to start moving around again.
4. Try to do stretching exercises and get up and walk.

5. Continue slowly to become more active based on advice from your doctor.

Once you've gotten through the early period after a heart attack, your doctor may talk to you about how to be active within your limits. Your doctor will probably want you to do an exercise test, also called a stress test. During this test, your doctor will ask you to exercise (usually walking on a treadmill) while he or she monitors your heart. Based on the results, your doctor will develop an exercise plan for you. (WHO, 2004).

Your doctor may also recommend that you get involved in a rehabilitation program. Rehabilitation programs are supervised by exercise specialists. Many hospitals sponsor these to get people started with a safe level of exercise after a heart attack. After a while, you'll probably be able to exercise on your own. (WHO, 2004).

Exercise strengthens your heart muscle. It can also help you feel more energetic, help you feel more in control of your health and help you lose weight and keep it off. Exercise may also lower your blood pressure and reduce your cholesterol level. (AHA, 2006).

The best types of exercise are those that involve your whole body, such as walking, cycling, jogging, cross-country skiing or swimming. Your doctor or rehabilitation therapists may also prescribe activities to increase your strength and flexibility. (WHO, 2004).

Your doctor will probably recommend that you make some changes in your diet, such as cutting back on fat and cholesterol and watching how much salt you eat. If you smoke, you will have to quit. Your doctor may

also suggest that you learn better ways to deal with stress, such as relaxation training and deep breathing. (WHO, 2004).

You can probably start having sex again in 3 to 4 weeks after your heart attack. As with other types of activity, you may need to start out slowly and work your way back into your normal patterns. (WHO, 2004).

### **1.16 Metabolic Syndrome:**

The hypothesis that I wish to success in, is to decrease in the number of dead people in Palestine, by focusing on the Metabolic syndrome of patients with myocardial infarction, this is really can be achieved by studying the Knowledge, Attitudes, and Practice of myocardial infarction patients toward their control of Metabolic Syndrome according to the place of residency, (City, Village, Refugee Camp).

Metabolic syndrome, sometimes referred to as Syndrome X is characterized by the presence of increased fasting blood glucose, obesity (particularly in the abdominal area), elevated serum triglycerides, elevated blood pressure, and low HDL cholesterol. The combination of any 3 factors listed in the table below leads to a diagnosis.

**Table (1.3)** Reference value of metabolic syndrome risk factors.

Risk Factor	Defining Level
Abdominal obesity Men Women	Waist circumference >102 cm (>40 in) >88 cm (>35 in)
Triglycerides	≥150 mg/dL
HDL cholesterol Men Women	<40 mg/dl <50 mg/dl
Blood pressure	130/85 mmHg
Fasting glucose	110 mg/dL

(AHA, 2006, from the website)

People with a family history of premature cardiovascular disease have an increased risk of atherosclerosis. These risk factors can't be controlled. Research shows the benefits of reducing the controllable risk factors for atherosclerosis:

- High blood cholesterol (especially LDL or "bad" cholesterol over 100 mg/dL)
- Cigarette smoking and exposure to tobacco smoke
- High blood pressure
- Diabetes mellitus
- Obesity
- Physical inactivity

Controlling of these risk factors with increase compliance of patients with myocardial infarction to the different types of drugs, can improve their

health and rehabilitate their life activities, increase their Knowledge, Attitudes, and Practice.

### **1.17 Knowledge Attitude and Practice. (KAP):**

Knowledge test was carried to evaluate the patient's knowledge concerning aspects to empower patient's self-management and included

1. Knowledge about diet regime, hypo-lipidemia and hyper-lipidemia and other risk factors,
2. Knowledge about disease complications and symptoms.
3. Knowledge about tools self-care management and physical activities.
4. Knowledge about the drug compliance importance.

Practices are daily activities that provide patients with self-control of the diseases that delay or prevent disease complications. These are usually followed diagnosis and include

Practicing diet regime, physical activity, smoking, compliance, and home monitoring test, like sugar and blood pressure.

**Chapter Two.**  
**Methodology**  
**(Materials and Methods).**

## **2.1 Back ground:**

Nablus district is considered as the third largest in the number of population after Hebron and Ramallah, with a population of 251 thousands. (Annual report 2004, MOH).

The community in Nablus as well as in other districts is distributed in three main demographic groups with specific socio economic characteristics. These groups live in the city, refugee camps, and villages. Health services in Palestine are offered by four different health care providers, the Palestinian national authority (ministry of health), UNRWA, NGOs, and private sectors.

The sectors that involved in our study are MOH (Alwatani hospital ICU unit), and private sectors (Nablus specialty hospital CCU unit, and CCU unit in Al-Arabi hospital).

## **2.2 Case definitions:**

The diagnosis of AMI was made when at least 2 of the following 3 standard criteria were met:

- 1) Ischemic symptoms.
- 2) Electrocardiogram on admission indicating ST elevation in 2 contiguous leads (0.1 mV in limb leads or 0.2 mV in precordial leads) or evolution of Q waves in serial electrocardiogram tracings;
- 3) Changes in serum enzyme levels. Most common CKMB.

### **2.3 Sample selection (Patients):**

The population under study was patients who developed AMI.

The medical records of all patients admitted to the Coronary Care Units of the following hospitals

1. Alwatani Hospital (governmental hospital).
2. Nablus specialty hospital.
3. Cardiac rehabilitation center in Al-Arabi hospital.

### **2.4 Methodology:**

From January 2006 to June 2006, profiles of patients with myocardial infarction were studied, A developed questionnaire designed according to the aim of the study. Consist from four parts:

#### **2.4.1 Demographic data:**

Age, gender, profession, marital status, place of residency (City, Village, and Refugee camp) .and educational level.

#### **2.4.2 Physical data:**

These data about different behaviors and lifestyle of patients with myocardial infarction, which includes.

- Excercises.
- Diet.
- Drug compliance

- Smoking.
- Stress.
- Knowledge Attitude and Practice.

### 2.4.3 Biochemistry profile:

Collecting blood sample from each participant for analyzing the following tests:

- Cholesterol.
- Triglyceride.
- HDL.
- LDL.
- FBS.

Quantitative determination of cholesterol, triglyceride, HDL, and FBS.

Blood is centrifuged to get serum or plasma, and then use chemistry analyzer to check the level of cholesterol, triglyceride, HDL, and FBS. (LABKIT, 2006).

While LDL calculated according to this formula, **LDL = Cholesterol – Triglyceride/5 – HDL.**

Biochemistry analyzer used KoneLab Pro. And ChemWell.

**Table 2.1** Reference Range, (LABKIT 2006).

<b>Test</b>	<b>Reference range</b>	<b>Abnormal</b>
Cholesterol	< 200 mg/dl	> 240 mg/dl
Triglyceride	<150 mg/dl	>200mg/dl
HDL	40-60 mg/dl	< 40mg/dl, > 60mg/dl
LDL	<100 mg/dl	>160 mg/dl.
FBS	60-110mg/dl	< 55mg/dl, > 120mg/dl.

While blood pressure measured manually for each patient admitted to the hospitals, measure both:

1. Systolic
2. Diastolic

#### **2.4.4 Anthropometric profile:**

- Body weight. (Kg). Weighting each patient to the nearest one kilogram.
- Body height. (cm), measure the height of each patient to the nearest one centimeter.
- Body mass index. Calculated according to the formula on page 9. (Return to 1.3.2.5).
- Waist. (cm), measure the waist of each patient to the nearest one centimeter.

#### **2.5 Exclusion criteria:**

Patients with AMI who had been admitted to the ICU in a state of shock, or who developed other types of shock, and those who died on admission were excluded from the study.

**2.6 Data analysis:**

Microsoft excel and SPSS used to analyze the data, which include the following calculated values, Mean, Standard deviation, Errors and frequency.

**2.7 Objectives:**

To assess the risk factors of metabolic syndrome that lead to myocardial infarction.

To find out the frequency and significance of known risk factors in our patient population.

To assess the rate of compliance toward different types of drugs among myocardial infarction patients.

To assess the knowledge, Attitude and Practice of myocardial infarction patients toward serum lipid, change their lifestyles and others profiles.

**2.8 Limitation of the study:**

This study only investigates patients with myocardial infarction living in Nablus district.

The study used one method to assess the awareness (Knowledge, Attitude, and Practice), compliance and risk factors of myocardial infarction.

The study used personal interview with myocardial infarction patient which mainly depend on patient memory that is affected by different physical and psychological factors.

**Chapter three**  
**(Results)**

### 3. General characteristics of the study sample:

#### 3.1 Age, Sex profile of study sample:

Age: Four out of five patients in the study sample with coronary artery disease were 50 years of age or older. Table (3.1) shows the percentage and the numbers of different age pattern of the study sample.

**Table (3.1)** Age and gender profile

Age	Male		Female		*Total
	#	%	#	%	
Less than 30 years.	5	4.63	1	2.38	6
30-50 years.	34	31.48	14	33.33	48
More than 50 years	70	64.81	26	61.90	96
Total	108	100%	42	100%	150

\*Total represents the sample size of both sexes.

#### **Males:**

From the study sample there were 4.63% less than 30 years, 31.48% between 30-50 years, and 64.81% more than 50 years old.

#### **Females:**

From the study sample their were 2.38% less than 30 years old, 33.33% between 30-50 years old, and 61.905 more than 50 years old.

### 3.2 Place of residency profile of the study sample:

**Table (3.2)** Place of residency and gender profile.

Place of residency	Male		Female		*Total
	#	%	#	%	
City.	51	47.22	19	45.24	70
Village.	37	34.26	14	33.33	51
Refugee camp.	20	18.52	9	21.43	29
Total	108	100%	42	100%	150

\*Total represents the sample size of both sexes.

Table 3-2 shows that, the study sample distributed into the following percentages according to the place of residency and sex.

#### **Males:**

From the study sample there were 47.22% live in Nablus city, 34.26% live in Nablus Villages, and 18.52% live in Nablus Refugee camps.

#### **Females:**

From the study sample there were 45.24% live in Nablus city, 33.33% live in Nablus villages, and 21.43% live in refugee camps.

### 3.3 Life style profile of study sample:

**Table (3.3).** Life style and gender profile

State		Yes		No		*Total
		#	%	#	%	
Smoking	M	65	60.19	43	39.81	108
	F	9	21.43	33	78.57	42
<b>Total</b>		<b>74</b>		<b>76</b>		<b>150</b>
Physical activity.	M	15	13.89	93	86.11	108
	F	1	2.38	41	97.62	42
<b>Total</b>		<b>16</b>		<b>134</b>		<b>150</b>
Work.	M	56	51.85	52	48.15	108
	F	11	26.19	31	73.81	42
<b>Total</b>		<b>67</b>		<b>83</b>		<b>150</b>
Diet control.	M	38	35.19	70	64.81	108
	F	22	52.38	20	47.62	42
<b>Total</b>		<b>60</b>		<b>90</b>		<b>150</b>

\*Total represent sample size according to sex

Smoker: who smoke more than 10 cigarettes.

Physically: active means engaging in regular sport or a like.

From study sample, table 3.3 shows that 60.19% of males and 21.43% of females of the study sample were smokers.

About, 13.89% of males and only 2.38% of females of the study sample were physically active.

Also, 51.85% of males and 26.19% of females of the study sample had work or profession.

And 35.19% of males and 52.38% of females of the study sample follow a control diet program.

### 3.4 Educational level profile of the study sample:

**Table (3.4)** Educational level and gender profile.

Level	Male		Female		*Total
	#	%	#	%	
Illiteracy.	36	33.33	17	40.48	53
Secondary.	58	53.70	19	45.24	77
Diploma.	4	3.70	2	4.76	6
Bachelor and above	10	9.26	4	9.52	14
<b>Total</b>	108	100%	42	100%	150

\*Total represents the sample size of both sexes.

Table 3.4 shows that the males of study sample distributed into the following percentages according to their educational level, 33.33% Illiterate, 53.70% finished their secondary level, 3.70% finished their diploma level, and 9.26% have Bachelor and above level.

While females educational level were 40.48% illiterate, 45, 24% finished their secondary level, 4.76% finished their diploma level, and 9.52 had Bachelor and above level.

### 3.5 Clinical characteristics of the study sample:

#### 3.5.1 Anthropometric profile of the study sample:

Table (3.5.1, A) Anthropometric and gender profile

Measure	Male			Female		
	Lowest	Highest	Mean	Lowest	Highest	Mean
Length	150	195	168.84	150	180	162.55
Weight	60	169	103.25	55	155	104.38
Waist	30	120	60.55	30	100	67.83
BMI	10.38	32.67	18.30	11.60	32.67	19.84

BMI and Mean were calculated, Waist measure to the nearest 1cm, Weight measure to the nearest 1kg, Height measure to the nearest 1 cm.

From table above the mean BMI for males was 18.3, while females was 19, 84.

The mean waist for males was 60.55, while females 67.83.

**Table (3.5.1, B) Obesity and gender profile**

	Status	Male		Female		*Total
		#	%	#	%	
<b>BMI</b>	Obese BMI>30	7	6.48	3	7.14	10
	Over weight 25<BMI<30	8	7.41	6	14.29	14
	Normal 18.5<BMI<24.9	22	20.37	14	33.33	36
	Under weight BMI <18.5	71	65.74	19	45.24	90
	<b>Total</b>	<b>108</b>	<b>100%</b>	<b>42</b>	<b>100%</b>	<b>150</b>
	<b>Waist</b>	Over 90	14	12.96	10	23.81
Less than 90		94	87.04	32	76.18	126
<b>Total</b>		<b>108</b>	<b>100%</b>	<b>42</b>	<b>100%</b>	<b>150</b>

\*Total represents the sample size of both sexes.

Table 3.5.1.B describe that 6.48% of males were obese, while 7.14% of females were obese.

7.41% of males and 14.29% of females of the study sample were overweight.

20.37% of males and 33.33% of females of the study sample were normal.

65.74 of males and 45.23% of females of the study sample were underweight.

12.96% of males and 23.81% of females of the study sample had waist circumference over 90cm.

87.04% of males and 76.18% of female of the study sample had waist circumference less than 90cm.

### 3.5.2 Chemistry profile of the study sample:

**Table (3.5.2)** Chemistry and gender profile

Test		Normal #	Normal %	HIGH #	HIGH %	*Total
FBS	M	59	54.63	49	45.37	108
	F	19	45.24	23	54.76	42
Cholesterol	M	71	65.74	37	34.26	108
	F	31	73.81	11	26.19	42
Triglyceride	M	59	54.63	49	45.37	108
	F	18	42.86	24	57.14	42
HDL	M	32	29.63	76	70.37	108
	F	13	30.95	29	69.05	42
LDL	M	63	58.33	45	41.67	108
	F	21	50.00	21	50.00	42

\*Total represents the sample size according to sex.

High means, FBS>140mg/dl, cholesterol> 240 mg/dl, triglyceride> 200 mg/dl, HDL> 60 mg/dl, and LDL> 130 mg/dl.

From table (3.5.2), 45.37% of males have high FBS, while 54.76% of females have high FBS.

34.26% of males have high cholesterol level, while 26.19% of females have high cholesterol.

45.37% of males have high triglyceride, while 57.14% of females have high triglyceride level.

70.37% of males have high HDL level, while 69.05% of females have high HDL level.

41.67% of males have high LDL level, while 50% of females have high LDL level.

### 3.6 Stress management among sample study:

#### 3.6.1 Cause of stress:

**Table (3.6.1)** Cause of stress and gender profile

Cause	Male		Female		*Total
	#	%	#	%	
Due to work.	13	12.04	6	14.29	19
Due to economy. And political situation.	58	53.70	21	50.00	79
Don't know.	37	34.26	15	35.71	52
<b>Total.</b>	108	100	42	100	150

\*Total represents the sample size of both sexes.

From the study sample, 12.04% of males and 14.29% of females of the study sample became stress due to work.

53.70% of males and 50% of females of the study sample became stress due to political situation and economy.

34.26% of males and 35.71% of females of the study sample did not know the reason why they become stress.

### 3.6.2 How the sample study members behave while they are stress?

**Table (3.6.2)** Behaviors of study sample after stress.

Behavior	Male		Female		*Total
	#	%	#	%	
Watch TV.	5	4.63	4	9.52	9
Eating.	17	15.74	11	26.19	28
Smoking.	45	41.67	5	11.90	50
Sport.	3	2.78	1	2.38	4
Visit friend.	2	1.85	4	9.52	6
Nothing.	36	33.33	17	40.48	53
<b>Total</b>	<b>108</b>	<b>100</b>	<b>42</b>	<b>100</b>	<b>150</b>

\*Total represents the sample size according to sex.

About 4.63% of males and 9.52% of females of the study sample manage their stress by watching T.V.

15.74% of males and 26.19% of females of the study sample managed their stress by eating.

41.67 of males and 11.9% of females of the study sample managed their stress by smoking.

2.78% of males and 2.38% of females of the study sample managed their stress by sport.

1.85% of males and 9.52% of females of the study sample managed their stress by visiting friends.

33.33% of males and 40.48% of females of the study sample did nothing to manage their stress.

### 3.7 Knowledge attitude and practice. (KAP):

Knowledge test was carried to evaluate the patient's knowledge concerning aspects to empower patient's self-management and included, knowledge about different risk factors of myocardial infarction were studied as described in table (3.7).

While practices are daily activities that provide patients with self-control of the diseases that delay or prevent disease complications. These are usually following diagnosis; table 3.7 shows the number of patients in the study sample having knowledge attitude and practice or not according to sex.

**Table (3.7)** Knowledge Attitude and Practice profile.

Behavior	Male		Female	
	Yes	No	Yes	No
<b>Knowledge.</b>	<b>61</b>	<b>47</b>	<b>16</b>	<b>26</b>
Total	108		42	
%	56.48	43.52	38.10	61.90
<b>Attitude.</b>	<b>24</b>	<b>84</b>	<b>35</b>	<b>7</b>
Total	108		42	
%	22.22	77.78	83.33	17.67
<b>Practice.</b>	<b>38</b>	<b>70</b>	<b>18</b>	<b>24</b>
Total	108		42	
%	35.19	64.81	42.86	57.14

From table (3,7), 56.48% of males and 38.10% of females, have a knowledge about myocardial infarction risk factors, while 43.52% of males and 61.90% of females, have not a knowledge about myocardial infarction risk factors were 16.

22.22% of males and 83.33% of females have attitude toward myocardial infarction prevention, while 77.78% of males and 17.67% of females have no attitude about myocardial infarction prevention.

35.19% of males and 42.86% of females practice their myocardial infarction prevention, while 64.81% of males and 57.14% of females did not practice their myocardial infarction prevention.

### 3.8 Drug compliance:

**Table (3.8)** Compliance profile.

Behavior	Male		Female	
	Yes	No	Yes	No
Take drugs on time.	53	55	22	20
Total	108	108	42	42
Percentage	49.10	50.90	52.38	47.62

From the study sample, about 49.10% of males and 52.38% of females keep their practice of myocardial infarction prevention according to cardiologist and general physician order (like medications described, and how they must manage their risk factors and change their lifestyle). While 50.90% of males and 47.62% of females, did not practice the order of their cardiologist or general physician.

### 3.9 Chronic diseases:

#### 3.9.1 The presence of other chronic diseases among study sample:

Table 3.9.1 Chronic diseases profile.

Disease		Yes	No	Yes%	No%	Total
Diabetes mellitus.	Male	70	38	64.81	35.19	108
	Female	28	14	66.67	33.33	42
Renal	Male	3	105	2.78	97.22	108
	Female	3	39	7.14	92.86	42
Hypertension	Male	87	21	80.56	19.44	108
	Female	30	12	71.42	28.58	42
Asthma	Male	4	104	3.70	96.30	108
	Female	4	38	9.52	90.48	42
Nothing	Male	23	85	21.30	78.70	108
	Female	4	38	9.52	90.48	42

About 64.81% of males and 66.67% of females of the study sample had diabetic.

About 2.78% of males and 7.14% of females of the study sample had Renal.

About 80.56% of males and 71.42% of females of the study sample had hypertensive.

About 3.70% of males and 9.52% of females of the study sample had asthma.

About 21.30% of males and 9.52% of females of the study sample had no clinical illness.

### 3.9.2 The presence of chronic diseases among relatives of study sample:

**Table (3.9.2)** Chronic diseases profile (Relatives).

Disease		Yes	No	Yes%	No%	Total
<b>Diabetes mellitus.</b>	<b>Male</b>	64	44	59.26	40.74	108
	<b>Female</b>	22	24	52.38	47.62	42
<b>Hypertension</b>	<b>Male</b>	76	32	70.37	20.63	108
	<b>Female</b>	25	17	59.52	40.48	42
<b>Stroke</b>	<b>Male</b>	9	99	8.33	91.67	108
	<b>Female</b>	5	37	11.90	88.10	42
<b>Cardiac diseases</b>	<b>Male</b>	64	44	59.26	40.74	108
	<b>Female</b>	15	27	35.71	64.29	42

Relatives mean: father, mother, brother, sister.

About 59.26% of males and 52.38% of females of the study sample relatives were diabetic.

About 70.37% of males and 59.52% of females of the study sample relatives were hypertensive.

About 8.33% of males and 11.9% of females of the study sample relatives were stroke.

About 59.26% of males and 64.29% of females' relatives were cardiac diseases.

### 3.10 Relationships:

#### 3.10.1 BMI, gender and chemistry profiles:

Table (3.10.1) BMI, gender and chemistry profiles relationships.

Subject	Gender	#	FBS	Cholesterol	Triglyceride
<b>BMI &gt; 25</b>	<b>M (108)</b>	<b>15</b>	303.00	212.14	310.00
	<b>F (42)</b>	<b>9</b>	218.43	207.70	243.80
<b>BMI &lt; 25</b>	<b>M (108)</b>	<b>93</b>	217.25	177.00	202.05
	<b>F (42)</b>	<b>33</b>	158.73	198.73	202.33

Data are means for 108 males and 42 females.

BMI > 25 P - value = 0.253, and BMI < 25 P - value = 0.448 (significant at P-value < 0.05).

#### **BMI > 25:**

From table above the mean of FBS was 303 mg/dl, Cholesterol was 212.14 mg/dl and triglyceride was 310 mg/dl, for males, while females FBS was 218.43 mg/dl, cholesterol was 207.70 mg/dl and triglyceride was 243.80 mg/dl.

#### **BMI < 25:**

From table above the mean of FBS was 217.25 mg/dl, Cholesterol was 177 mg/dl and triglyceride was 202.05 mg/dl, for males, while females FBS was 158.73 mg/dl, cholesterol was 198.73 mg/dl and triglyceride was 202.33 mg/dl.

#### 3.10.2 Smoking, gender and chemistry profiles:

Table (3.10.2) Smoking, gender and chemistry profiles relationships.

Subject	Gender	#	FBS	Cholesterol	Triglyceride
<b>Smoker</b>	<b>M (108)</b>	<b>65</b>	189.75	211.88	189.25
	<b>F (42)</b>	<b>9</b>	188.00	198.00	467.40
<b>Non-smoker</b>	<b>M (108)</b>	<b>43</b>	118.47	215.35	275.35
	<b>F (42)</b>	<b>33</b>	251.00	267.00	244.00

Data are means for 108 males and 42 females.

Smoker P- value = 0.236, and non-smoker P - value = 0.064 (significant at P- value < 0.05).

**Smoker:**

From table above the mean of FBS was 189.75 mg/dl, Cholesterol was 211.88 mg/dl and triglyceride was 189.25 mg/dl, for males, while females FBS was 188 mg/dl, cholesterol was 198 mg/dl and triglyceride was 467.4 mg/dl.

**Non-smoker:**

From table above the mean of FBS was 118.47 mg/dl, Cholesterol was 215.35 mg/dl and triglyceride was 275.35 mg/dl, for males, while females FBS was 251 mg/dl, cholesterol was 267 mg/dl and triglyceride was 244 mg/dl.

**3.10.3 Diet control, gender and chemistry profiles:**

**Table( 3.10.3)** Diet gender and chemistry profiles relationships.

<b>Subject</b>	<b>Gender</b>	<b>#</b>	<b>FBS</b>	<b>Cholesterol</b>	<b>Triglyceride</b>
<b>Diet control</b>	<b>M (108)</b>	<b>38</b>	123.67	150.00	166.33
	<b>F (42)</b>	<b>22</b>	111.00	204.50	144.50
<b>Not control</b>	<b>M (108)</b>	<b>70</b>	168.90	192.60	183.80
	<b>F (42)</b>	<b>20</b>	249.33	236.33	326.67

Data are means for 108 males and 42 females.

Diet control P – value = 0.001, diet not control P – value = 0.047 (significant at P – value <0.05).

**Diet control:**

From table above the mean of FBS was 123.67 mg/dl, Cholesterol was 150 mg/dl and triglyceride was 166.33 mg/dl, for males, while females FBS was 111 mg/dl, cholesterol was 204.5 mg/dl and triglyceride was 144.5 mg/dl.

**Not control:**

From table above the mean of FBS was 168.90 mg/dl, Cholesterol was 192.60 mg/dl and triglyceride was 183.80 mg/dl, for males, while females FBS was 249.33 mg/dl, cholesterol was 236.33mg/dl and triglyceride was 326.67 mg/dl.

**3.10.4 Place of residency, gender and lipid profile:****Table (3.10.4)** Place of residency, gender and lipid profiles relationships.

Subject		HDL	LDL	Cholesterol	Triglyceride
City	M	41.10	137.20	226.40	163.43
	F	43.00	135.32	224.56	165.68
Village	M	37.44	136.70	228.40	177.69
	F	47.53	138.44	230.90	188.90
Refugees	M	39.55	124.33	210.55	174.30
	F	49.50	128.30	202.62	179.66

Data are means for 108 males and 42 females.

City P – value = 0.317, Village P- value = 0.771, refugees P – value = 0.837 (significant at P-value < 0.05).

From table above HDL mean for males in city 41.1 mg/dl, villages 37.44 mg/dl, and refugee camps 39.55 mg/dl, while females 43 mg/dl in city, 47.53 mg/dl in villages and 49.50 mg/dl in refugee camps.

LDL mean for males in city 137.20 mg/dl, villages 136.70 mg/dl, and refugee camps 124.33 mg/dl, while females 135.32 mg/dl in city, 138.44 mg/dl in villages and 128.30 mg/dl in refugee camps.

Cholesterol mean for males in city 226.40 mg/dl, villages 228.4 mg/dl, and refugee camps 210.55 mg/dl, while females 224.56 mg/dl in city, 230.90 mg/dl in villages and 202.62 mg/dl in refugee camps.

Triglyceride mean for males in city 163.43 mg/dl, villages 177.67 mg/dl, and refugee camps 174.30 mg/dl, while females 165.68 mg/dl in city, 188.90 mg/dl in villages and 179.66 mg/dl in refugee camps.

### 3.11 Metabolic syndrome

According to the reference values of metabolic syndrome risk factors provided by AHA 2006, (table 1.3 page # 38). Table 3.11 designed.

About 15.7% of males and 21% of females of the study sample had metabolic syndrome, according to the AHA standards.

**Table (3.11)** Metabolic syndrome risk factors among study sample.

<b>Risk factor.</b>	<b>Sex</b>	<b>#</b>	<b>%</b>	<b>Total</b>
<b>Waist circumference.</b>	M. (>102cm).	20	19.23	108
	F. (> 88cm).	14	33.33	42
<b>Triglyceride level.</b>	M. (>150mg/dl).	62	59.62	108
	F. (> 150mg/dl).	27	64.29	42
<b>HDL level</b>	M (<40mg/dl).	33	31.73	108
	F (<50 mg/dl).	12	28.57	42
<b>FBS level</b>	M (>110mg/dl).	73	70.19	108
	F (>110mg/dl).	27	64.29	42

Table 3.11 show the percentage of the risk factors of metabolic syndrome among study sample which was as the following

19.23% of males and 33.33% of females were abdominal obese.

59.62% of males and 64.29% of females have triglyceride more than 159mg/dl.

31.73% of males have HDL less than 40 and 28.57% of females have HDL less than 50 mg/dl.

70.19% of males have FBS greater than 110 mg/dl, while 64.29% of females have FBS greater than 110 mg/dl.

**Chapter four**  
**(Discussion Conclusion and Recommendations).**

This study was conducted to assess and identify the risk factors of myocardial infarction among patients having ischemic heart disease and live in Nablus district.

#### **4.1 Demographic profiles:**

##### **4.1.1 Age and sex:**

Most of the sample in the study was more than 50 years (64.81% males, 61.9% females); followed by 31.48% males and 33.33% females aged 30-50 years, while only 4.63% males and 2.38% females aged less than 30 years old, (Table 3.1).

These results were expected because age is considered as one of the major risk factors of myocardial infarction, Over 83 percent of people who die of coronary heart disease are 65 or older, (American heart association. 2006).

Since we are dealing with myocardial infarction patients one should expect that the majority of participants were of the elderly (>50 years old) group, (DUM, 2000).

Most of the sample in the study was males; they represent about 72% of our study, while females were 28%, (sample size 150).

Men have a greater risk of heart attack than women do, and they have attacks earlier in life. Even after menopause, when women's death rate from heart disease increases, it's not as great as men's, (American heart association, 2006).

#### **4.1.2 Place of residency:**

47.22% of males and 45.24% of females of the study sample live in Nablus city, 34.26% of males and 33.33% of females of the study sample live in Nablus villages, while 18.5% of males and 21.43% of females of the study sample live in Nablus refugee camps.

The percentage of males and females live in Nablus city were relatively equals.

The study show the high incidence of myocardial infarction in the city, villages and refugee camps, this is due to the political situations, continuous Israeli army operations, and bad economical situations which borne of high smoking, low exercises, low diet control, and high stress, (Major risk factors of myocardial infarction).

#### **4.2 Education profile:**

33.33% of males and 40.48% of females of the study sample were illiterate, (Table 3.4). This may be due to our culture and political situation that make women in many cases responsible for their families and home job.

Only 9.26% of males' and 9.56% of females of the study sample finished their university degree level, (Table 3.4).

While most of study sample participants were above 50 years old, it is expected to have low percent of participants who finished their university degree level.

53.7% of males and 45.24% of females of the study sample stop their education in secondary level.

In the past most of Palestinian population were stopped their study in secondary level, this was due to the political situations and bad economy.

### **4.3 Life style profiles:**

#### **4.3.1 Smoking:**

60.19% of males and 21.43% of females of the study sample were reported to be smokers, (smoke more than 10 cigarettes), (Table 3.3).

Males reported more smoker than females; they have more stress and more responsibility in their life due to the economical and political situation. While females have social barriers to be smoking, (socially not accepted), except those who face a difficult situations due to their health, economy, or family conditions, they try to cope with smoking.

Cigarette smoking increases the risk of coronary heart disease by itself. When it acts with other factors, it greatly increases risk. Smoking increases blood pressure, decreases exercise tolerance and increases the tendency for blood to clot, (AHA, 2006).

Cigarette smoking is the most important risk factor for young men and women. It produces a greater relative risk in persons under age 50 than in those over 50 years old, (AHA, 2006).

Women who smoke and use oral contraceptives greatly increase their risk of coronary heart disease and stroke compared with nonsmoking women who use oral contraceptives, (AHA, 2006).

Smoking decreases HDL (good) cholesterol. Cigarette smoking combined with a family history of heart disease also seems to greatly increase the risk of heart attack, (AHA, 2006).

While smoking plays a major role in heart attack, we must find alternatives instead of smoking, by this we can encourage cigarettes cessation programs and protocols, and decrease the incidence or prevent second or third heart attack.

#### **4.3.2 Physical activity, (sport and work):**

Only 13.89% of males and 2.38% of females of the study sample engaged in regular schedule for sport, (Table 3.3).

51.85% of males and 26.19% of females of the study sample had a work, (Table 3.3).

Age and sex affect physical activities profile negatively according to the social acceptance and severity of disease, in our study; most of patients were in elderly, (> 50 years old), So it is socially not accepted for them to be engaged in a scheduled sport or physical activities, their health situation need a physician follow up during their engagement in sport or physical activity.

An inactive lifestyle is a risk factor for coronary heart disease. Regular, moderate-to-vigorous physical activity helps prevent heart and blood vessel disease. The more vigorous the activity the greater your benefits. However, even moderate-intensity activities help if done regularly and long term exercise can help control blood cholesterol, diabetes and obesity, as well as help lower blood pressure in some people, (AHA, 2006).

Regular exercise is a major way to reduce the risk of having a further MI. So our physicians must educate the patients about how to engage in physical activity regularly.

The responsibility of public health specialist is to encourage the creation of supportive environments, the most important one is to educate the community about the benefits of regular exercises, and to make sport for all ages males and females part of the norms.

#### **4.3.3 Diet profile:**

35.19% of males and 52.38% of females of the study sample control their diet consumption, (Table 3.3).

Control diet means that patient take in consideration the types of food they eat daily according to their health situation or medical illness. The results of our study recommended that it is important to facilitate the relationship between patients, dietitian and health promoters, in order to achieve the goal of the study.

Dietitian can provide protocols for patients with heart attack, while health promoter function is to encourage patient to follow these protocols, by improving their knowledge about the effect of some types of food on their clinical illness or health.

Eating healthy helps to control obesity, and lower cholesterol level. Both of these help to reduce risk of heart attacks, (AHA, 2006).

There is some evidence that eating oily fish (herring, sardines, mackerel, salmon, kippers, pilchards, fresh tuna, etc) helps to protect against heart disease, (Europe heart association 2002).

Fruit and vegetables contain 'antioxidants' and vitamins which may help to prevent atheroma building up on the vessels, (Dr. Yaqoob Hawash research, 2005).

#### **4.4 Anthropometric profile:**

##### **4.4.1 BMI:**

6.48% of males and 7.14% of females of the study sample were obese, 7.41% of males and 14.29% of females of the study sample were over weight, while 20.37% of males and 33.33% of females of the study sample were normal, but 65.74% of males and 45.24% of females of the study sample were underweight.

The result of overweight among myocardial infarction patients still high, this was due to many reasons, type of food which has high calories full of fat and carbohydrates, and having no physical activity during their free times.

The patients must know that, the food is made up of water, fat, protein, carbohydrate and various vitamins and minerals, too much fat -- especially in waist area – make you at higher risk for health problems, including high blood pressure, high blood cholesterol, diabetes, heart disease and stroke, (AHA, 2006).

When people eat too many calories, or too much saturated fat and cholesterol, their blood cholesterol levels often rise, that raises their risk of heart disease. (AHA, 2006).

##### **4.4.2 Waist circumference:**

12.96% of males and 23.81% of females had a waist circumference over 90cm.

87.04% of males and 76.18% of females of the study sample had waist circumference less than 90cm.

Women still more obese than men, as we talk above, women stay at home for long time this encourage them to eat more than men.

In short, the heavier you are, the longer your carry the extra weight, and the more the fat is around your waist, the greater your health risk, (Kaplan biochemistry, 1984).

Obesity plays an important role in cardiovascular diseases occurrence many researchers proved that there are a relationship between fatty cells surrounded coronary arteries and cardiovascular diseases, they believe that these cells produce a chemical substance which damage many biological process inside our bodies, they found that the activity of these cells increases when there is no sufficient oxygen present. They believe that these cells initiate the cause of type two diabetes and coronary diseases; these are epidemic diseases, (Ronald research, the complications of fatty cells, 2003).

#### **4.5 Chemistry parameters:**

##### **4.5.1 Lipid profile and FBS:**

(Table 3.5.2) 45.37% of males and 54.76% of females of the study sample had high FBS.

34.26% of males and 26.19% of females of the study sample had high cholesterol level.

45.37% of males and 57.14% of females of the study sample had high triglyceride.

70.37% of males and 69.05% of females of the study sample had high HDL level.

41.67% of males and 50% of females of the study sample had high LDL level.

When patients have a number of risk factors, such as having diabetes, being overweight, having high blood pressure, smoking, and having a high cholesterol level, they add up and greatly increase their risk for heart disease, (Europe heart association 2005).

The results indicate that study sample participants had impaired lipid profile and sugar level, this indicate that they didn't care about what they eat, this was due to low knowledge attitude and practice toward lipid profile.

Patients with myocardial infarction must check the level of lipids in the blood, (LDL, HDL, and triglycerides); by this they can reduce the second or third attack of heart disease.

When cholesterol level indicates you are at increased risk for coronary artery disease and stroke, try diet and exercise to lower and control your cholesterol first. Diet and exercise can effectively lower cholesterol. You should try these strategies before you consider taking cholesterol-lowering medications, (AHA, 2006).

#### **4.6 Stress management profile:**

About 4.63% of males and 9.52% of females of the study sample manage their stress by watching T.V.

Researches proved that Watching T.V can help prevent stressors action (WHO stress management 200), this can help patients if T.V available during their stress.

15.74% of males and 26.19% of females of the study sample managed their stress by eating.

41.67 of males and 11.90% of females of the study sample managed their stress by smoking.

2.78% of males and 2.38% of females of the study sample managed their stress by sport.

1.85% of males and 9.52% of females of the study sample managed their stress by visiting friends.

33.33% of males and 40.48% of females of the study sample did nothing to manage their stress.

Individual response to stress may be a contributing factor. Some scientists had noted a relationship between coronary heart disease risk and stress in a person's life, their health behaviors and socioeconomic status. These factors may affect established risk factors. For example, people under stress may overeat, start smoking or smoke more than they otherwise by this the risk factors of heart attack will increase.

#### **4.7 Knowledge, attitude and practice (awareness profile):**

Table (3, 7) shows that 56.48% of males and 38.10% of females of the study sample, had knowledge about myocardial infarction risk factors, while 43.52% of males and 61.90% of females of the study sample had not a knowledge about myocardial infarction risk factors.

While knowledge is important as a test to evaluate the patient's knowledge concerning aspects to empower patient's self-management, it is important to empower the value of knowledge about how to manage the controllable risk factors of all chronic diseases especially myocardial infarction.

22.22% of males and 83.33% of females of the study sample had attitude toward myocardial infarction prevention, while 77.78% of males and 17.67% of females of the study sample had no attitude about myocardial infarction prevention.

Attitude means that the patients with the idea of myocardial infarction prevention protocols and programs.

35.19% of males and 42.86% of females of the study sample practice their myocardial infarction prevention, while 64.81% of males and 57.14% of females of the study sample did not practice their myocardial infarction prevention.

Practice their myocardial infarction prevention means that they work on the controllable risk factors to decrease the risk of second or third heart attack.

Questionnaires were aimed towards identifying knowledge, attitude and practice with regard to primary and secondary prevention of heart disease. In general, greater knowledge, attitude and practice must be founded among post-infarction patients.

53.7% of males and 50% of females of the study sample believed that stress play a major role in their disease occurrence, they believed that stress is due to the political situation and economy, this is expected in Palestine specially in Nablus city which one of the most cities that faced a strong Israeli army operations.

The overall picture suggests that there is a need to continue with more initiating information campaigns, mainly through television, and to look for new tools aimed towards identifying and treating high-risk individuals.

#### **4.8 Drug compliance profile:**

It is possible to shift practice if the evidence of benefit is strong, it means that if there are strong benefits from the action of patients toward myocardial infarction prevention, while patients alone cannot manage their risk they need the action of medical physician, public health physician, pharmacist, Nurses and allied medical technicians as a medical team to encourage drug and other compliance of patients.

Access to a cardiologist is associated with better survival compared to no access to a cardiologist among a cohort of patients already admitted with AMI. This effect is mainly due to the more frequent use of effective medicines by the group referred to cardiologists. Hospitals may improve

survival by improving access to effective medicines and by coordinating care between cardiologists and general physicians.

#### **4.9 Chronic diseases profile:**

64.81% of males and 66.67% of females of the study sample had diabetic.

2.78% of males and 7.14% of females of the study sample had Renal.

80.56% of males and 71.42% of females of the study sample had hypertensive.

3.70% of males and 9.52% of females of the study sample had asthma.

21.30% of males and 9.52% of females of the study sample had no clinical illness.

##### **4.9.1 Hypertension and diabetes:**

Most patients admitted to the three hospitals are hypertensive patients.

High blood pressure directly increases the risk of coronary heart disease which leads to heart attack and stroke, especially along with other risk factors. High blood pressure usually has no symptoms. It's truly a "silent killer."

The pressure in the blood vessels depends on how hard the heart pumps, and how much resistance there is in the arteries. It is thought that slight narrowing of the arteries increases the resistance to blood flow,

which increases the blood pressure. The cause of the slight narrowing of the arteries is not clear. Various factors probably contribute, (Patient UK, 2006).

Treatment by altering any relevant lifestyle factors is important. In addition, medication is usually advised if blood pressure remains at 160/100 mmHg or above despite a period of observation and tackling any lifestyle factors.

64.81% of males and 66.67% of females of the study sample had diabetic.

Diabetes increases the risk for AMI attack rate, incidence, case-fatality, recurrence and mortality and is an important contributor to all AMIs in middle-aged people, (Majd. A.M Abu-Ali, thesis, 2003).

These results indicate that the major two risk factors associated with the sample study are diabetes and hypertension. So if the patients try to manage these two risk factors (lifestyle changes or by medications), they will prevent high proportion of the second heart attack.

#### **4.9.2 Cardiac diseases and stroke among relatives of patients:**

This section can describe the proportion of genetic factors or a family history.

59.26% of male and 64.29% of female of the study sample relatives had cardiac diseases.

This percent is considered high, while like these factors cannot be prevented but it can be managed by managing of other risk factors (risk

factors that can be prevented). By this we prevent high proportion of heart attack or myocardial infarction.

Children of parents with heart disease are more likely to develop it themselves. African Americans have more severe high blood pressure than Caucasians and a higher risk of heart disease. Heart disease risk is also higher among Mexican Americans, American Indians, native Hawaiians and some Asian Americans. This is partly due to higher rates of obesity and diabetes. Most people with a strong family history of heart disease have one or more other risk factors. Just as you can't control your age, sex and race, you can't control your family history. Therefore, it's even more important to treat and control any other risk factors you have, (AHA, 2006).

8.33% of male and 11.9% of female of the study sample relatives had stroke.

This percent is considered small compared with cardiac diseases proportion. But we cannot neglect it we can educate patients with a family history about how to prevent the first, second and third occurrence. Like cardiac diseases family history, patients can control the controllable risk factors.

Insulin resistance with impaired glucose tolerance is a major risk factor for type 2 diabetes and Coronary Heart Disease (CHD). It is linked with each of the metabolic criteria for diagnosis of `metabolic syndrome, (AHA2005).

#### **4.10 Relationships:**

##### **4.10.1 BMI, gender and chemistry profiles:**

For patients with BMI > 25 P - Value = 0.253, and patients with BMI < 25 P – Value = 0.448 (significant at P-value <0.05). It means that studying the relationship between BMI and chemistry profile statistically not significant.

##### **BMI > 25:**

The mean of FBS was 303 mg/dl, Cholesterol was 212.14 mg/dl and triglyceride was 310 mg/dl, for males, while females FBS was 218.43 mg/dl, cholesterol was 207.70 mg/dl and triglyceride was 243.80 mg/dl.

##### **BMI < 25:**

The mean of FBS was 217.25 mg/dl, Cholesterol was 177 mg/dl and triglyceride was 202.05 mg/dl, for males, while females FBS was 158.73 mg/dl, cholesterol was 198.73 mg/dl and triglyceride was 202.33 mg/dl.

Obese patients have FBS, and lipids higher than those not obese. So, one of factors than decrease the level of sugar and lipids is to be not obese.

Patients' rehabilitation programs must involve criteria's about how to educate patients about the value of obesity on chemistry profile.

##### **4.10.2 Smoking, gender and chemistry profiles:**

For smoker patients P- value = 0.236, and non-smoker patients P - value = 0.064 (significant at P- value < 0.05). It means that studying the

relationship between smoking and chemistry profile statistically not significant.

**Smoker:**

The mean of FBS was 189.75 mg/dl, Cholesterol was 211.88 mg/dl and triglyceride was 189.25 mg/dl, for males, while females FBS was 188 mg/dl, cholesterol was 198 mg/dl and triglyceride was 467.4 mg/dl.

**Non-smoker:**

The mean of FBS was 118.47 mg/dl, Cholesterol was 215.35 mg/dl and triglyceride was 275.35 mg/dl, for males, while females FBS was 251 mg/dl, cholesterol was 267 mg/dl and triglyceride was 244 mg/dl.

According to this study smoking profile suggest triglyceride has a different value between smoker and non-smoker, this results not proved in previous studies, it means that it needs more studies to be more accurate.

**4.10.3 Diet control, sex and chemistry profiles:**

For patients who had diet control P – value = 0.001, while patients who hadn't diet control P – value = 0.047 (significant at P – value <0.05). this result indicate that studying the relationship between diet control and chemistry profile is statistical significant.

**Diet control:**

The mean of FBS was 123.67 mg/dl, Cholesterol was 150 mg/dl and triglyceride was 166.33 mg/dl, for males, while females FBS was 111 mg/dl, cholesterol was 204.5 mg/dl and triglyceride was 144.5 mg/dl.

**Not control:**

The mean of FBS was 168.90 mg/dl, Cholesterol was 192.60 mg/dl and triglyceride was 183.80 mg/dl, for males, while females FBS was 249.33 mg/dl, cholesterol was 236.33mg/dl and triglyceride was 326.67 mg/dl.

The concentration of chemistry profile parameters increased when patients were diet not control, while it was moderately normal among patients who were diet control, by this we can see the value of diet control among myocardial infarction patients.

**4.10.4 Place of residency, gender and lipid profile:**

HDL mean for males in city 41.1 mg/dl, villages 37.44 mg/dl, and refugee camps 39.55 mg/dl, while females 43 mg/dl in city, 47.53 mg/dl in villages and 49.50 mg/dl in refugee camps.

For males HDL in patients live in city higher than those live in refugee camps than in villages.

Females HDL in patients live in refugee camps higher than those live in villages and city.

LDL mean for males in city 137.20 mg/dl, villages 136.70 mg/dl, and refugee camps 124.33 mg/dl, while females 135.32 mg/dl in city, 138.44 mg/dl in villages and 128.30 mg/dl in refugee camps.

While  $P - \text{v} > 0.05$  it means that study the relations between place of residency, gender and lipid profile are statistical non-significant.

LDL for those lives in refugee camps less than those live in city and villages for both sexes.

#### **4.11 Metabolic syndrome:**

19.23% of males and 33.33% of females were abdominal obese, 59.62% of males and 64.29% of females have triglyceride more than 159mg/dl, 31.73% of males have HDL less than 40 and 28.57% of females have HDL less than 50 mg/dl, 70.19% of males have FBS greater than 110 mg/dl, while 64.29% of females have FBS greater than 110 mg/dl.

About 15.7% of males and 21.42% of females of the study sample had metabolic syndrome, this result indicate the effectiveness of metabolic syndrome on the occurrence of heart attack, and the result shows that both males and females of the study sample are at risk of metabolic syndrome which is the cause of different chronic diseases especially heart diseases.

Metabolic syndrome with complex conditions and risk factors is a major problem which needs the concern and attention of primary care physicians and patients alike, as more and more patients of Palestine are dying from accelerated cardiovascular disease.

#### **4.12 Conclusion**

There is scope for lifestyle change in reducing AMI risk, by changes in physical activity, smoking and dietary habits. In addition, measures to control hypertension and diabetes should be given a high priority in any national health policy to prevent AMI.

While some patient become stress due to the political, social and economical situation due to long term conflict in Nablus city, we must educate patients and public a like about how to manage these stressors or to cope with it.

Myocardial infarction patients must have knowledge about their clinical illness and how they will behave to prevent its complications.

All patients must have an attitude about prevention of their clinical illness, and it is not enough but they need to practice the protocols and programs recommended for that prevention.

#### **4.13 Recommendations:**

1. It is essential to adopt international recognized protocols for primary, secondary and tertiary prevention, diagnosis, treatment and follow up for myocardial infarction patients, and it is the function of both bio-physician (general physician and specialist) and primary health care provider at all sectors public, private, and NGOs.
2. Conducting educational programs targeting patients and their families, this can be achieved through NGOs.
3. As diet is one of the major risk factors of myocardial infarction, it is essential to find the most effective diet protocol and supply it to myocardial infarction patients in order to lose their weight, this can be done cooperated with qualified dietitian.
4. It is important for patients to follow physical activities hourly every day; this must be followed up by health promoters, public health specialist, physicians and cardiologists.
5. While patients with myocardial infarction still smoke in high percentage, it is essentially to follow patients with health providers or if needed psychologist to act with them and to solve their problems.
6. Community support is one of the most important criteria's for smoking cessation programs.
7. Providing a follow up centers for chronic diseases prevention and health promotion to decrease the incidence of many chronic

diseases especially ischemic heart diseases, this can be achieved through Decision makers.

8. Rehabilitation programs for all patients survive a heart attack (MI), to prevent the complications of the heart attacks.

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## **Appendix**

**Questionnaire**

Questionnaire number.....  
 Hospital .....

Date.....

**Demographic data:** Fill with X in appropriate cycle.

- ❖ Sex  
 Male  Female
- ❖ Age  
 Less than 30 years  0-50 years  More than 50 years
- ❖ Place of residency:  
 Village  Refuge camp  City
- ❖ Martial status:  
 Single  Married  Widow
- ❖ Educational level  
 Illiteracy  Elementary le   
 Secondary le  Diploma lev  Bachelor and abo
- ❖ Work status  
 Home work  Employer  Not work
- ❖ At what age MI occur?.....
- ❖ How many MIs attack you have .....

**Measurement:** Fill with correct measure.

**Anthropometric profile:**

1. Length
2. Weight
3. Waist Circumference
4. B.M.I

**Biochemistry profile:**

5. Cholesterol
6. Triglyceride
7. HDL
8. LDL
9. FBS
10. Blood Pressure

**Lifestyle:**

Fill with X in appropriate cycle.

❖ **Smoking:**

1. Smoker
1. Less than 5 cigarettes.
2. 5-20 cigarettes.
3. More than 20 cigarettes
2. Nonsmoker

❖ **Physical activity:**

Does he/she do physical exercise?

Yes.  No. 

If yes:

1. Daily.
2. Weekly.
3. Monthly.

❖ **Nutrition:**

1. Amount:

Two meals  Three meals  More than three meals

2. Type of diet:

Vegetarian       Containing fat       Not control

3. What did you eat before 24 hours:

Breakfast		Dinner		Others	
Type	Amount	Type	Amount	Type	Amount

**Chronic diseases:** Fill with X in appropriate cycle.

Do you have any of the following diseases?

- 1. Hypertension
- 2. Diabetic
- 3. Renal failure
- 4. Asthma
- 5. Not available

Did any of your family (mother, father, brother, uncles, aunts, grand's) had any of the following diseases?

- 1. Hypertension
- 2. Diabetic
- 3. Stroke
- 4. Cardiac diseases

What was the outcome?

1. Improvement
2. Disability
3. Death

**Stress management :**

Fill with X in appropriate cycle.

How you behave when you are stress?

1. Watching television:
2. Visit friends
3. Eating
4. Smoking
5. Sport
6. Nothing

How you classify the nature of your work?

1. Office
2. Easy not harmful.
3. Harmful, become so tired while finish.
4. Not work

Do you know the reason why you become stress?

Yes  No

If yes:

1. Due to work
2. Barriers, curfew, long transportation.
3. Economical

**Knowledge, attitude, practice, and drug compliance**

Fill with X in appropriate cycle.

Do you know the risk factors of myocardial infarction?

Yes.  No.

Can you control your self to avoid them?

Yes.  No.

Have you any information about myocardial infarction prevention?

Yes.  No.

Are you with myocardial infarction prevention?

Yes.  No.

How many types of drug you take?

1. Nothing
2. One.
3. Two.
4. Three.
5. More.

Do you know the medical benefit of all these drugs?

Yes.  No.

Do you take the drug on time?

Yes.  No.

Does drug lead to any of the following symptoms?

1. Headache.
2. Constipation.
3. General weakness.
4. Others.
5. No drug

## تقييم العوامل المسببة للجلطات القلبية عند المرضى في منطقة نابلس

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قدمت هذه الأطروحة استكمالاً لمتطلبات درجة الماجستير في الصحة العامة بكلية الدراسات العليا  
في جامعة النجاح الوطنية في نابلس، فلسطين.

2006

ب

## تقييم العوامل المسببة للجلطات القلبية

عند المرضى في محافظة نابلس

إعداد

مأمون عبد الرحيم طاهر عبيدية

إشراف

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## الملخص

هدفت الدراسة إلى تقييم العوامل المسببة للجلطات القلبية عند المرضى وذلك بسبب زيادة نسبة الوفيات الناجمة عن أمراض القلب وتصلب الشرايين في فلسطين بشكل كبير, حيث أصبحت الجلطات القلبية منتشرة بشكل كبير في أنحاء العالم, وبشكل خاص في البلدان التي تتحول إلى نمط الحياة الغربية. إن فكرة دراسة العوامل المسببة للجلطات القلبية تأتي لهدف تقييم نمط الحياة و تصرفات المرضى بعدما تعرضوا لجلطات قلبية.

لقد تم تقييم العوامل المسببة للجلطات القلبية عند المرضى الذين يسكنون محافظة نابلس, وتم تصميم استبيان خاص بهدف الدراسة.

150 مريضاً انتخبوا بشكل عشوائي من محافظة نابلس لكي يشاركوا في هذه الدراسة (108 رجال, 42 إناث), وهؤلاء هم مرضى يعانون من جلطات قلبية تمت مقابلتهم في ثلاثة مستشفيات مختلفة, مستشفى نابلس التخصصي 50 مريض, قسم رعاية القلب المكثفة في المستشفى العربي التخصصي 50 مريضاً, والمستشفى الوطني الحكومي 50 مريضاً.

برامج إحصائية استعملت أثناء الدراسة لإيجاد العلاقة بين المتغيرات المختلفة للبيانات التي تم جمعها.

وجد أن معظم المرضى الذين شاركوا في الدراسة كانت أعمارهم أكثر من 50 عاماً عند كلا الجنسين.

كانت النتائج بالنسبة المئوية عند كلا الجنسين كما يلي:

65% من الرجال و 67% من الإناث من المشاركين في الدراسة هم مرضى سكري, 81% من الرجال و 71% من الإناث من المشاركين في الدراسة هم مرضى ضغط, بينما 59% من أقارب الرجال و 64% من أقارب الإناث هم مرضى قلب.

#### تم تقييم جميع المشاركين من حيث:

نوعية الغذاء الذين يتناولونه يوميا, عما إذا كانوا يقومون بنشاطات رياضية و عمل فيزيائي, التدخين, التوتر العصبي, المعرفة, الموقف, الممارسة, عن اهتمامهم بتناول الأدوية الضرورية وقناعتهم في ووصفات الطبيب, كما تم فحص ضغط الدم, نسبة السكر فالدم, الكوليسترول, الدهون الثلاثية, الدهون الحميدة, الدهون السيئة, الوزن, الطول, و حساب BMI.

معظم المرضى ليس لديهم أي نشاط فيزيائي (86% من الرجال, 98% من الإناث), لا يتبعوا حمية غذائية (65% من الرجال, 48% من الإناث), وكانت نسبة المدخنين من المرضى عالية مقارنة مع وضعهم الصحي (60% من الرجال, 21% من الإناث), وكان هناك عدم انتظام في فحص السكر والدهنيات.

أخيرا تم دراسة العلاقة ما بين العوامل المسببة للجلطات القلبية و نمط الحياة لدى المرضى المصابين. وتبين أن الوضع الاقتصادي, الاجتماعي, والسياسي ونقص في معرفة أسباب المرض وكيفية الوقاية منه من أهم العوامل التي أدت إلى خلل في نمط حياتهم والتي أدت إلى تدهور وضعهم الصحي وتعرضهم لنوبات قلبية ثانية وثالثة.

كما وبينت الدراسة بأن المرضى الذين يعانون من جلطات قلبية لهم بحاجة إلى برامج تأهيلية بالتعاون مع أطباء الرعاية الأولية وأخصائي القلب و المتثقف الصحي والعائلة.