Comparison of myocardial infarction symptoms, risk factors, and enzyme levels between Black and White males

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COMPARISON OF MYOCARDIAL INFARCTION SYMPTOMS, RISK FACTORS, AND ENZYME LEVELS BETWEEN BLACK AND WHITE MALES

by

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A thesis submitted in partial fulfillment of the requirements for the degree of

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in

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Department of Nursing
University of Nevada, Las Vegas
August 1997

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ABSTRACT

Studies have shown that racial groups experience pain and symptoms of a myocardial infarction differently (Neill, 1993; Clarke, 1996). Based on this premise, the purpose of this study was to investigate if Black males and White males experience the signs and symptoms of an acute myocardial infarction differently. This study also compared age, pain levels, risk factors, and cardiac enzyme levels between Black (n = 42) and White (n = 96) males who have had an acute myocardial infarction. The sample was drawn from a Southwest area county hospital. A random descriptive survey using chart review of one hundred thirty eight subjects' (42 Black males and 96 White males) was completed. Chi-square, t-tests, and correlation were used to analyze the data.

Results of the chi-square analysis indicated that significant differences in the type of myocardial infarction symptoms experienced between Black and White males were chest pain ($X^2 = 4.77, df = 1, p = .02$) and right arm pain ($X^2 = 7.14, df = 1, p = .007$).

The cardiac iso-enzyme levels between Black and White males, tested by t-test, indicated no significant difference ($t = -.57, p = .10$). A significant age difference was found between Black and White males ($t = -2.02, p = .00$) with Blacks being younger.

Although the incidence of drug abuse ($X^2 = 5.85, df = 1, p = .01$) and diabetes ($X^2 = 4.244, df = 1, p = .03$) was higher among Black males who have had a myocardial infarction than White males, there was no significant difference between subjects in regard to history of hypertension ($X^2 = .845, df = 1, p = .35$) or smoking ($X^2 = .017, df = 1, p = .89$). Correlation analysis indicated that level of pain was significantly related to alcohol
abuse ($r = .179$, $p = .03$), and smoking was significantly related to shortness of breath ($r = .271$, $p = .00$).

Awareness of these racial differences have important implications for nursing in the care of the myocardial infarction patient.
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CHAPTER I

INTRODUCTION

There are a variety of signs and symptoms associated with an acute myocardial infarction. Because the signs and symptoms are varied to sometimes unknown, adults often have difficulty recognizing that they are experiencing a myocardial infarction.

The American Heart Association (AHA), (1993) stated there are recognizable signs and symptoms of “typical chest pain” associated with a myocardial infarction. These symptoms have been described as: uncomfortable pressure, fainting, fullness, squeezing, pain in the center of the chest, pain spreading to the shoulders, neck, or arms, sweating, nausea, shortness of breath, and chest discomfort with lightheadedness. The AHA identified age, sex, and race as possible risk factors for myocardial infarction. For example, persons who were 55 years or older, males, and nonwhites had an increased incidence of myocardial infarction. Additional risk factors were hypertension, high blood cholesterol levels, cigarette smoking, and diabetes mellitus. Some ethnic groups are more prone to various cardiovascular risk factors than other ethnic groups, for example, Blacks were reported to have a higher incidence of hypertension and diabetes mellitus (Cotran, 1989).

Researchers have studied the relationship between ethnic groups and how they experience pain, a key symptom of a myocardial infarction. Over 40 years ago, Zborowski
(1952) studied the pain behavior of four ethnic groups regarding their attitudes toward pain and behavioral responses to pain. These four ethnic groups were Jewish, Italian, Irish, and Yankees. Each of these four ethnic groups reported experiencing pain differently from the same stimulus. The varying levels of pain which differed significantly were also thought to be associated with the culture of the subject.

More recently, Neill (1993) studied ethnic differences of pain symptoms associated with acute myocardial infarction. The findings indicated that Black males had significantly more shortness of breath than White males. This finding was supported by Perkoff and Strand (1973) who noted that while White acute myocardial infarction patients were much more likely to complain of chest pain, Black acute myocardial infarction patients were twice as likely to complain of dyspnea (shortness of breath).

In view of the different symptoms presented by Black males and White males, one could question if teaching specific to an ethnic group is needed for the public and health care providers. Are Black males seeking emergency medical help for “dyspnea” while actually having an acute myocardial infarction? Do health professionals recognize the possibility of acute myocardial infarction when a patient presents with “dyspnea” but denies “chest pain”? If such atypical symptoms of myocardial infarction remain unrecognized, patients may delay seeking medical treatment which could complicate their condition, possibly contributing to congestive heart failure (CHF).

This study examined whether there are differences between Black males and White males regarding the experienced signs and symptoms associated with a myocardial infarction. Awareness of the different symptoms experienced in myocardial infarctions
between different ethnic groups will enable health care workers to identify, treat, and teach the community to notice the symptoms of an acute myocardial infarction. The purpose of the study was to compare the signs and symptoms of Black and White males who have experienced an acute myocardial infarction. The sample was drawn from a county hospital in the Southwest. In addition, the study compared cardiovascular risk factors and cardiac iso-enzyme levels between these two racial groups.
CHAPTER II

CRITICAL REVIEW OF RELEVANT LITERATURE

Introduction

This chapter addresses concepts and research studies which support and offer rationale for the present study. The pathophysiology of an acute myocardial infarction is presented as a foundation for the conceptual framework of the study. The symptoms of a myocardial infarction are discussed followed by the pathogenesis of coronary artery disease. Risk factors associated with coronary artery disease are presented. Studies regarding the race and symptoms of myocardial infarction as well as cardiac risk factors between Black and White male populations are examined. Gaps in the literature are mentioned.

Pathophysiology of an Acute Myocardial Infarction

Myocardial ischemia presents by angina pectoris. "Angina pectoris is a squeezing, substernal pain described as a feeling of tightness or fullness" (Bullock, 1992 p. 500). Roberts (1989) stated the pain is elicited from an insufficient oxygen supply to the myocardial cells. The time estimated between onset of ischemia and myocardial muscle damage is estimated to be approximately 15-20 minutes (Bullock, 1992).

A myocardial infarction results from prolonged ischemia to the myocardium with
irreversible damage and death of the muscle. A myocardial infarction causes reduced contractility with abnormal wall motion, altered left ventricular compliance, elevated left ventricular end-diastolic pressure, reduced stroke volume, and reduced ejection fraction.

All acute myocardial infarctions have a central area of necrosis where the actual infarction occurred. The area of injury is surrounded by a ring of ischemia. Scar tissue replaces the necrotic myocardial muscle which can take up to 6 weeks for complete replacement.

The clinical manifestations of an acute myocardial infarction depend on the severity of the infarct, the previous physical condition of the individual, and whether other infarcts have occurred. Hurst (1990) reported the absence of typical symptoms cause 12 to 30 percent of myocardial infarctions to be unrecognized. One of the atypical symptoms is respiratory difficulties. Many people deny the possibility of a myocardial infarction occurring. Diagnosis of a myocardial infarction is made on physical examination by a physician and specific diagnostic tests, such as iso-enzymes.

Cardiac Enzymes

Cardiac enzymes are elicited when myocardial muscle cells die. These enzymes are creatinine phosphokinase (CPK), serum glutamic oxaloacetic transaminase (SGOT), and lactic dehydrogenase (LDH). These values elevate and then return back to normal after a myocardial infarction. The CPK is the first to elevate, exceeding normal levels at 6-8 hours, peaking at 24 hours, and returning to normal 3-4 days later. The CPK is present in the skeletal muscle (MM), brain and kidney (BB), and cardiac (MB). Iso-enzymes are considered for diagnostic purposes. The iso-enzymes reflect if the cardiac enzymes were
derived from the myocardial bands (MB). The MB’s represent the cardiac enzymes from the myocardial cells.

CPK and MB percentages are the values most commonly used in diagnosing a myocardial infarction because these elevate first. The SGOT elevates at 8-12 hours, peaks at 18-36 hours, and returns back to normal in 3-4 days. The LDH elevates in 24-48 hours, peaks at 3-6 days, and returns to normal in 8-14 days. There are 5 LDH enzymes. LDH-2 is usually greater than LDH-1. If LDH-1 is greater than LDH-2 a myocardial infarction will be considered. The LDH is used the least due to the length of time needed to see an elevation in the enzymes.

Symptoms of a Myocardial Infarction

Pain

Pain is the most common symptom of a myocardial infarction. It is usually described as a heaviness, tightness, or constriction in the chest. “Common locations are substernal or retro sternal, radiating to the neck, jaw, and arms, or to the back” (Lewis & Collier, 1996 p. 908). The pain is persistent and can occur at rest or during activity. The pain usually lasts about 20 minutes and is worse than anginal pain. Some people experience epigastric pain which is not relieved by antacids. Other people have no pain but describe the myocardial infarction as weakness, “discomfort”, or shortness of breath (Lewis & Collier, 1996).

The AHA reported that their list of identified symptoms associated with a myocardial infarction was obtained by reviewing numerous past studies. No research
studies or tools specific to the signs or symptoms have been developed. (Theis, 1997).

Sanders (1979) identified three systems that interact to produce pain. These three systems are: 1) sensory/discriminative system, 2) motivational/affective system, and 3) cognitive/evaluative system. The sensory/discriminative system processes information about the intensity, strength, and temporal and spatial aspects of pain. Sanders claims these sensations are mediated through afferent nerve fibers, the spinal cord, the brainstem, and the higher brain centers, and cause quick withdrawal or removal from the pain stimulus. The motivational/affective system determines the person’s learned or acquired approach/avoidance behaviors. Sanders continued to say the behavior is then channeled through the reticular formation, limbic system, and brainstem. The cognitive/evaluative system overlies the person’s acquired behavior regarding the experience of pain. The interpretation of the accepted pain behavior is learned by cultural preferences, male roles, and past experiences. Sanders concluded by saying the influence of the cognitive/evaluative system can block, change, or enhance the perception of pain.

Pain tolerance is defined as the “duration of time or the intensity of pain that an individual will endure before initiating overt pain responses” (McCance & Huether, 1994, page 439). McCance stated pain tolerance is influenced by the person’s cultural experiences, expectations, role behaviors, and physical and mental health. Pain tolerance varies among people. No direct relationship exists between the intensity of painful stimuli and a person’s perception of pain. McCaffery, (1980) reported tolerance may be increased by alcohol consumption, medication, and strong beliefs or faith.

McCance and Huether (1994) defined acute pain as a “protective mechanism that
alerts the individual to a condition or experience that is immediately harmful to the body” (page 438). Pain receptors which are nerve endings scattered throughout nearly every body tissue transmit the pain signal to the brain (Ganong, 1985). These receptors are specialized nerve cells which respond to specific information from the external and internal environments (Bullock, 1992).

Chest pain is usually caused by a buildup of lactic acid or overstretching of the ischemic myocardium which irritates myocardial nerve fibers. The afferent sympathetic fibers enter the spinal cord from levels C3 to T4 (McCance and Huether, 1994). This accounts for the variety of locations and radiation pattern experienced. Dyspnea, diaphoresis, and indigestion may also be associated with the pain in relationship to the level of the spinal cord nerve levels.

**Diaphoresis**

Diaphoresis is experienced in the initial phases of a myocardial infarction (McCance, 1994). Norepinephrine and epinephrine are released from the stimulation of the sympathetic nervous system causing diaphoresis and vasoconstriction of the peripheral blood vessels (Lewis & Collier, 1996). This response of the sympathetic nervous system causes the skin to become ashen, clammy, and cool (McCance, 1994). Fever may also be seen due to the inflammatory response of a myocardial infarction. Blood pressure and heart rate will also increase initially due to the catecholamine response (Lewis & Collier, 1996).

**Nausea and Vomiting**

A person experiencing a myocardial infarction may have nausea and vomiting.
Severe pain stimulates the reflux center of the vomiting center (Lewis & Collier, 1996).

Vasovagal responses may also occur from the infarcted myocardium (McCance, 1994).

Pathogenesis of Coronary Artery Disease

Lesions of coronary atherosclerosis develop slowly and progressively over time. The initial change begins early in life. The first stage consists of a fatty streak which may develop into a fibrous plaque or atheroma. This atheroma plaque is white colored and becomes elevated which eventually occludes the lumen of the artery, either partially or fully (Bullock, 1992). The core of the plaque becomes necrotic, and hemorrhage and calcification can result. Kenner (1981) reports lesions do not usually cause symptoms until the lumen is 60% or more occluded. Collateral circulation may be developed if the occlusion develops over a long enough time period. Atherosclerotic plaques usually appear at bifurcations, curvatures, and tapering of the arteries (Bullock, 1992). The right and left main coronary arteries become a prime target due to the sharp angle off the aorta. As the coronary artery lumen progressively narrows, the resistance to blood flow increases and the vascular supply to the area below the blockage will not receive any oxygen or blood flow to maintain life and function. This leads the myocardial muscle blood supply to be compromised. When the amount of blood flow through the vessel decreases, oxygen uptake is decreased causing a compromise of the oxygen supply to the tissues. The oxygen depletion causes myocardial ischemia, angina pectoris, which is the usually described chest pain.

Schlant (1990) reported the major factors that affect oxygen consumption include
the amount of myocardial muscle mass, the contractile state, heart rate, and intra
myocardial tension generated. The oxygen supply for all this work is delivered only from
the coronary arteries. Hurst (1990) added the myocardial muscle extracts up to 70 percent
of the oxygen provided by the coronary arteries. The only way to increase oxygen delivery
would be for the myocardial muscle to increase the heart rate and respiratory rate.

Associated Risk Factors of Coronary Artery Disease

Coronary artery disease (CAD) is almost totally caused by atherosclerosis of the
coronary arteries (Bullock, 1990). The probability of developing CAD is increased when
the risk factors are increased. The alterable risk factors are diet, smoking, hypertension,
sedentary living, diabetes mellitus, and alcohol abuse. Alterable risk factors can be
changed. The unalterable risk factors are age, sex, race, and genetic heritage.

Smoking

Cigarette smoking is an addictive, alterable risk factor. Wenger (1986) added that
smoking decreases the HDL, increases LDL cholesterol, and also alters oxygen transport
in the myocardium. Oberman (1989) reported that smokers have an increased risk of
cardiac dysrhythmia and sudden death because of oxygen uptake reduction.

Hypertension

Hypertension is a significant risk factor in CAD (Bullock, 1992). The systolic
blood pressure is reflective on arterial pressure in the rest of the body. The cardiac muscle
needs to work harder to force blood into the rest of the body when the systolic pressure is
high. Hypertension increases the heart’s workload, which promotes atherosclerosis of the
coronary vessels and also leads to left ventricular hypertrophy (Cooper, 1991).

Hypertension is defined by Wright (1993) as a systolic pressure greater than 140 mm of mercury (Hg.) and/or a diastolic blood pressure greater than 90 mm Hg.. The damage to the inner lining of the blood vessels promote an increase in the permeability of lipids and platelet aggregation to the arterial wall forming blockage. The Internet Medical Education (1997) reported people who have no high pain levels during their myocardial infarctions often have sugar diabetes mellitus and/or hypertension.

**Diabetes Mellitus**

Diabetes mellitus causes alteration in carbohydrate and fat metabolism, therefore, increasing the frequency of CAD. One can maintain or decrease the risk factor by keeping the body weight and blood sugar levels under control.

**Alcohol**

Alcohol has not been directly linked to an increase in serum cholesterol but has been positively related to high blood pressure. Livingston (1994) claimed the rates of alcohol abuse and dependence were higher than other forms of drug abuse and dependence in Americans. Alcohol can mask the pain levels of a myocardial infarction by slowing the response of the receptors transmitted by the afferent fibers. Hurst, Logue, Rackley, Schlant, Sonnenblick, Wallace, & Wenger (1986) reported studies have "demonstrated a direct cardiotoxic effect of excessive alcohol on myocardial tissue, with long term effects resulting in collagen accumulation, diminished nucleic acid pools, and loss of membrane transport systems" (page 1021). Sheehy (1992) recommends further research on this issue. McCance (1994) stated alcohol is proven to increase body weight.
triglyceride levels, and systolic blood pressure and even may impair left ventricular function. Wynne & Braunwald (1992) found that a large number of individuals with idiopathic dilated cardiomyopathy are alcoholics. They concluded that the long term effect of myocardial dysfunction may be stopped or even reversed if the alcohol consumption was slowed down or stopped in the beginning stages before significant damage occurred. The cardiomyopathy is thought to be caused from a heavy consumption of alcohol by a “direct toxic effect of alcohol or of its metabolites; effects of nutritional deficits, especially thiamine deficiency; and toxic effects of beverage additives such as cobalt” (McCance & Huether, 1994, page 1036).

Drug Abuse

Drug abuse has no proven effect on coronary artery disease. Cocaine and heroin among other drugs are frequently administered intravenously. Infection can be caused from intravenous (IV) drug abuse which can lead to myocarditis. “Myocarditis is the inflammation of the heart muscle, or the myocardium” (Wright, 1993, p. 535). Serious damage can happen to the heart muscle and valves when myocarditis develops. The symptoms of myocarditis are usually elicited by tachycardia and symptoms of heart failure. Most types of myocarditis resolve with prescribed drug therapy, however, a small percentage progresses further to congestive cardiomyopathy. Dyspnea, fatigue, and heart failure may lead to an ischemic event resulting in an acute myocardial infarction. Congestive or dilated cardiomyopathy is usually of unknown etiology but association has been made with alcoholism, diabetes, and drug toxicity (Bullock, 1992). McCance & Huether (1994) stated most often Black males between 40 and 60 years of age have
dilated cardiomyopathies. The long term effect of dilated cardiomyopathy is cardiomegaly. The enlargement of the heart includes hypertrophy and dilatation. The dilatation results in a hypokinetic myocardium (Bullock, 1992). The symptoms usually experienced are exertional dyspnea, fatigue, paroxysmal nocturnal dyspnea, and pulmonary edema. The Department of Health and Human Services (1992) reported an increase in cocaine-related emergency room visits to unprecedented levels and a 15 percent increase in heroin-related emergency room visits (Treaster, 1992).

Race and Symptoms of Myocardial Infarction

Various studies investigate the relationship of race to cardiac symptoms. Raczynski (1994) found that race independently associates the perception of cardiac symptoms, and attributes of cardiac symptoms differently. When variables were controlled, Blacks were less likely to report painful experiences and symptoms of cardiac origin than Whites. Blacks reported more non-painful symptoms such as diaphoresis, shortness of breath, nausea and vomiting, unconsciousness, or indigestion and fullness. According to Raczynski, Whites reported more arm pain and numbness than Blacks (N=2,416). This study had 1,140 White males, 347 Black men, 574 White women, and 355 Black women.

Perkoff and Strand (1973) reported White acute myocardial infarction patients were much more likely to complain of chest pain, while Black acute myocardial infarction patients tended to complain of dyspnea (N=314). Neill (1987) conducted a similar study which examined the difference in presentation of acute myocardial infarction symptoms. The findings were similar to Perkoff and Strand's. Neill viewed subjects (N=151) in a
time frame of 2 to 21 days after an acute myocardial infarction. The subjects were asked to recall the symptoms experienced from memory. A chi-square test showed that Black subjects were more likely to present with shortness of breath than other ethnic backgrounds studied.

Lin (1983) suggested that researchers further examine clinical features related to the “ethnic blind spot”. Lin described the “ethnic blind spot” in Neill’s study as the failure of the physician to listen carefully. For example: when the admitting physician described chest pain radiating to the arm to subjects participating in the study, the subjects did not choose that term from the McGill Pain Questionnaire. The subjects stated that the pains were two separate pains, a heaviness in the chest and tingling in the arm. Neill also reported professionals must bridge the ethnical barriers to assure prompt diagnosis and quality care.

Shott (1990) reported that White subjects were added to the White column of Neill’s study to make the expected frequency larger. Another chi-square was calculated which did reach a significance level of .05 to find that Black subjects did have significantly more shortness of breath symptoms than White subjects.

Perkoff and Strand’s (1973) findings regarding atypical symptoms of acute myocardial infarction in Black males needs to be confirmed. There has been increasing evidence that Blacks have atypical presentation of acute myocardial infarction (Keil, Saunders, and Lackland, 1985; Langford, Oberman, and Borhani, 1984: Neill, 1987; Perkoff and Strand, 1973). Clark (1989) also reported White patients were most likely to complain of chest pain while Black patients have a lower incidence of chest pain or
discomfort and a higher incidence of dyspnea. Clark continued to state patients with chest pain more often had congestive heart failure (CHF) and a history of hypertension. Blacks with hypertension were significantly more likely to have no chest pain than were Whites with hypertension (p < .01).

The significant association of shortness of breath in Black males who experience an acute myocardial infarction is explained by physiologic and psychological reasons. Black males have a high chance of developing hypertension (Curry, 1991). Hypertension can develop CHF which are precursors of an acute myocardial event. Professionals need to be aware that Black males are more likely than White males to have shortness of breath as a symptom of acute myocardial infarction.

Some studies suggested differences existed in the underlying morphologic substrates of myocardial infarction in Black and Whites. Two major anatomic differences have been found between Blacks and Whites with myocardial infarction (Lee, 1997). The first major difference is that obstructive coronary artery disease is less common among Blacks than Whites. The National Heart Lung, and Blood Institute's percutaneous transluminal coronary angioplasty registry (N=2015) patients with myocardial infarctions reported Blacks were more likely to have multi vessel disease than White patients (72% versus 48%, p < .001). Secondly, Black patients with a myocardial infarction have left ventricular hypertrophy and hypertension more frequently than White males.

Curry (1991) stated there is no convincing evidence that clinical manifestations are different in coronary heart disease in Blacks versus Whites. Opinions were gathered on various socioeconomic backgrounds using small sample sizes. Good (1990) stated in
actual practice clinicians do not incorporate racial variability as part of their diagnoses.

Race and Cardiac Risk Factors

Hypertension, obesity, diabetes mellitus, tobacco use, and alcohol abuse are variables that can promote a myocardial infarction (Oberman, 1989). Published demographics indicate that there is a relationship between these risk factors and ethnicity. Black Americans have a higher prevalence of hypertension, diabetes mellitus, cigarette smoking, and obesity, which contributes to a higher level of coronary artery disease (Curry, 1991).

Essential hypertension is a common problem affecting 18% of adults between the ages of 25-74, but Blacks are twice as prone to develop hypertension as Whites (Roberts 1971-975). The hypertension rate is 18.1 per 100 for White males ages 25-74 compared to 35.3 per 100 for Black males ages 25-74 (Rowland, 1981). Cooper (1991) reported approximately 80 percent of Black patients with coronary heart disease (CHD) already have hypertension, which promoted atherosclerosis of the coronary vessels and led to hypertrophy of the left ventricle. Black patients with a myocardial infarction have hypertension more frequently than Whites (Clark, 1989; Whittle, 1993).

The Department of Health and Human Services (DHHS) (1990) adds that diabetes mellitus is 33% more prevalent in Blacks than in Caucasians in the United States, especially in those who are overweight. Obesity is a risk factor for hypertension, non-insulin-dependent diabetes mellitus, and cardiovascular disease and a major factor for mortality.
National Health and Nutrition Examination Survey II (NHANES) (1990) data reported that middle aged (35-54 years) Black males have a higher prevalence of overweight and severe overweight than White Americans (LaCroix et al., 1989). Black men are less obese for ages 20-34 and 55-64 years of age, but in Black men ages 65-74 years, obesity rates are basically the same as White American men (Foster & Burton, 1985). The typical Black American diet appears to have a higher intake of cholesterol and saturated fat due to the consumption of meat, fried foods, and eggs (Sanjur, 1982; Kittler & Sucher, 1989; Block et al., 1988). These three studies found total fat consumption is similar among Blacks and Whites.

Scott (1991) reported the estimated national prevalence of alcohol and other drug abuse/dependence disorders in the United States from the Epidemiologic Catchment Area program (ECA). Data was collected by the ECA in the early 1980's. The National Household Survey on Drug Abuse (NHSDA) (1991) collected data in the early 1990's and reported that alcohol rates in Blacks were lower than Whites in all age groups. The ECA and NHSDA agree that alcohol and tobacco are the most used and abused substances in the United States. NHSDA reported illicit drug use was lower in the Black population for those 12-25 years old but higher for those 26 years old and older.

According to ECA, Blacks 20 years of age and older were more often current smokers and less often former smokers than Whites. Health Resources and Services Administration (1990) report between 1965 and 1985, Black men who smoked were less likely to be heavy smokers, defined as 25 or more cigarettes per day, than White males.

Alcohol, tobacco, and drug use are variables for a variety of medical conditions.
Even though the White population's rate of alcohol consumption is slightly higher, Black men had higher incidences of cirrhosis, esophageal cancer, and hypertension, which is aggravated by alcohol use. According to Leffall (1990), the Black subjects death rate related to these conditions is approximately one and one-half times that of Whites. Nicken (1991) agrees, reporting Black mortality rates associated with these conditions to be about 50% higher than for Whites.


Gaps in the Literature

A review of the literature indicated there are only a few recent studies which address race and symptoms of myocardial infarction. Although past studies have identified racial differences in types of myocardial infarction symptoms experienced, these studies have not utilized the American Heart Association's descriptors as a means of classifying such symptoms. Also, the relationship between severity of myocardial infarction (indicated by iso-enzyme levels) and race have not been documented in research studies. Lastly, there is a gap in the literature regarding whether or not pain levels reported in myocardial
infarction were influenced by an abuse of alcohol or drugs.

Summary

This chapter discussed the pathophysiology of an acute myocardial infarction. Symptoms of a myocardial infarction were discussed followed by the pathogenesis of coronary artery disease. The associated risk factors of coronary artery disease were discussed and followed by the comparison of race and symptoms of myocardial infarction. An overview of cardiac risk factors was presented in light of racial differences. In conclusion, gaps in the literature were identified as a basis for the present study.
CHAPTER III

FRAME OF REFERENCE

Introduction

This chapter presents a summary of the conceptual framework of the study previously addressed in Chapter II. Variables investigated in the study are clearly identified and visually depicted by a simple model. The research problem is discussed and followed with the research questions which direct the study. Definitions of the variables and assumptions conclude the chapter.

Conceptual Framework and Model

A myocardial infarction is defined as irreversible necrosis to an area of the heart resulting in death of a portion of the myocardial muscle. A myocardial infarction results from an occluded coronary artery. Commonly, a thrombus lodges in a coronary artery which has been previously narrowed by atherosclerotic plaque from high cholesterol levels.

Risk factors may predispose an individual to having a myocardial infarction. Predisposing factors which cannot be controlled by the individual are age, sex, and race. Incidence of myocardial infarction's commonly begin with middle age. Males have traditionally suffered myocardial infarctions more frequently than females. The influence of
race as a predisposing factor appears to be correlated with other risk factors and conditions associated with myocardial infarction.

Risk factors which can be controlled by the individual are diabetes mellitus, hypertension, and smoking. These conditions increase the workload of the heart by increasing afterload and increasing the oxygen demand of the heart. The heart must work harder to pump against higher peripheral resistance caused by hypertension, diabetes, and smoking. Smoking also increases the oxygen demands of the body.

While alcohol and drug abuse have not been proven to promote myocardial infarction, these lifestyle actions stress the heart and potentially decrease the individual’s perception of pain associated with a myocardial infarction.

Signs and symptoms following a myocardial infarction are related to death of cardiac tissue. The higher the level of muscle damage the higher the level of released cardiac iso-enzymes. The signs and symptoms of an acute myocardial infarction reflect systemic responses associated with it’s location, depth, and width. Responses commonly include pain, shortness of breath, diaphoresis, and nausea.

Research Problem

The study investigated the role of race in myocardial infarction. Is there a difference in the signs and symptoms of acute myocardial infarction experienced by Black and White males? In addition to investigating racial differences regarding the signs and symptoms of a myocardial infarction, the study examined racial differences regarding predisposing risk factors and cardiac iso-enzyme levels.
If it is indicated that Black and White males do experience different symptoms associated with myocardial infarction, this information could be helpful to health care professionals. Health care workers could possibly diagnose and treat patients more appropriately based on their presenting signs and symptoms. The person experiencing a myocardial infarction might be able to recognize the symptoms more quickly and hopefully seek medical attention sooner. Ideally, this information could be disseminated through publications and classes, such as cardio-pulmonary resuscitation (CPR) and advanced cardiac life support (ACLS) courses offered by the American Heart Association.

Research Questions

The following research questions direct the study.

1. Is there a difference in myocardial infarction symptoms experienced by Black and White males?

2. Is there a difference in cardiac iso—enzyme levels between Black and White males who have had an acute myocardial infarction?

3. Is there a difference in the incidence of smoking, diabetes, and hypertension among Black males and White males who have had an acute myocardial infarction?

4. Is there a difference in the incidence of drug abuse and alcohol abuse among Black and White males who have had an acute myocardial infarction?

5. Is there an age difference between Black males and White males who have had an acute myocardial infarction?
6. Is the level of pain experienced in an acute myocardial infarction related to drug abuse or alcohol abuse?

7. Is there a relationship between smoking, diabetes, or hypertension and the symptoms of an acute myocardial infarction?

Variables of Study

Figure 1 on page 24 depicts the selected variables of the present study.

Predisposing risk factors for myocardial infarction are presented on the left side of the model. They are grouped as uncontrollable (age and race), controllable (diabetes mellitus, hypertension, and smoking), and questionable (alcohol and drug abuse) factors which may promote a myocardial infarction. On the right side of the model are variables which reflect measurement (cardiac iso-enzyme levels) and outcomes (symptoms and pain levels) associated with a myocardial infarction.

Definitions of Variables

The following definitions are used in the study for the selected variables.

Race

Theoretically, race is defined as a group of persons who share distinctive genetic and physical characteristics. Operationally, race is Black or White as recorded on the subject's hospital admission sheet.

Age

Theoretically, age is defined as the number of years that a person has lived at the
Figure 1 Conceptual Framework Depicting Variables Used in the Study.
time of experiencing a myocardial infarction. Operationally, age is the recorded number of years of the subject at time of hospital admission.

**Diabetes Mellitus**

Theoretically, diabetes mellitus is defined as a “metabolic disorder characterized by a relative or absolute absence of the hormone insulin, or by insulin resistance, or both, which results in impaired use of carbohydrates and altered metabolism of fats and protein” (Bullock, 1996, p. 733). Operationally, diabetes is a physician’s diagnosis of diabetes mellitus confirmed by elevated glucose and/or controlled by insulin, diet, or oral agents.

**Hypertension**

Theoretically, hypertension is a condition in which an individual has an abnormal sustained elevated blood pressure usually defined as greater than 140/90. Operationally, hypertension is a documented history of hypertension on the subject’s chart.

**Smoking**

Theoretically, smoking is defined as the personal use and inhaling of tobacco products. Operationally, smoking is identification of the subject as a smoker as recorded as such in the subject’s chart.

**Alcohol Abuse**

Theoretically, alcohol abuse is defined as a condition characterized by the dependence upon and repeated use of alcoholic beverages. Operationally, alcohol abuse is identification of the subject as having a history of alcohol abuse as recorded in the subject’s chart.

**Drug Abuse**
Theoretically, drug abuse is the consistent consumption of drugs taken for the purpose of mind-altering effects, or in response to addiction. Operationally, it is identification of the subject as a drug abuser as recorded in the subject’s chart by the physician.

**Myocardial iso-enzymes**

Theoretically, myocardial iso-enzymes are the enzymes which are released into the bloodstream as a result of myocardial damage. Operationally, they are the highest reading of CK-MB percentage (greater than 3%) recorded in the laboratory results’ section of the subject’s chart.

**Symptoms of Myocardial Infarction**

Theoretically, symptoms of a myocardial infarction include: uncomfortable pressure, fullness, squeezing, pain in the center of the chest, pain spreading to shoulders neck or arm(s), chest discomfort with lightheadedness, fainting, sweating, nausea, and shortness of breath. Operationally, symptoms of myocardial infarction include documentation of the above symptoms (described by the AHA to be symptoms of acute myocardial infarction) on the subject’s chart.

**Pain Levels**

Theoretically, pain levels are subjective perceptions of discomfort related to disease or injury which are transmitted via the nervous system. Operationally, pain level is the highest documented subjective score on the Numerical Rating Scale (1-10) obtained within the first 24 hours of care.
Assumptions

The study accepts the following assumptions:

1. Subjects answer truthfully when asked to describe their symptoms or to give information.

2. Data recorded by health professionals in a client’s chart reflect accuracy.

3. The American Heart Association’s descriptors of symptoms associated with an acute myocardial infarction identify such symptoms.

4. The Numerical Rating Scale of Pain (NRS) measures an individual’s perception of pain.

5. Diagnostic and laboratory results reflect the physiological status of the client.

Summary

This chapter synthesized the conceptual framework of the study and identified the selected variables of the study. The research problem and seven research questions were presented and followed with definitions of the variables. In conclusion, the researcher's assumptions regarding the study were listed.
CHAPTER IV

METHODS AND PROCEDURES

Introduction

The purpose of this study was to compare the differences of symptoms between Black and White American males who experience chest pain associated with myocardial infarction. This chapter describes the research design, sample, setting, measurement methods, procedure, ethical considerations, and the plan for data analysis.

Research Design

The research design used was a comparative descriptive analysis. Comparisons of symptoms between Black and White males experiencing chest pain were investigated. A non-experimental research design was used to determine whether relationships existed between patients’ racial status and the American Heart Association descriptors for an acute myocardial infarction, as well as among other variables of study.

Sample

The sample consisted of 138 male patients who had been discharged from a Southwest county hospital. Subjects who were accepted into the study were medically diagnosed on admission as rule out myocardial infarction (R/O MI), unstable angina...
(USA), or acute myocardial infarction (AMI). Discharge diagnosis confirmed that the subject had suffered a myocardial infarction. Subjects were found by entering DRG codes for acute myocardial infarctions, unstable angina, and R/O myocardial infarction, race, and age (25-75) years old into the hospitals' computer. Every third subject was randomly selected from the listing. The chart was reviewed for data occurring within the first 24 hours (or less) from admission diagnosis. A myocardial infarction diagnosis is based on the patient's history, electrocardiagram changes, and the first three different serum enzyme levels obtained within the first 24 hours of admission.

The sample was comprised of 42 Black and 96 White American males. Adequate sample size was confirmed by using a computer program to determine the power to be 0.84 with a correlation of 0.17 and a beta of 0.16. This means there was an 84% chance of the correlation in the sample to be 0.104 or greater. The beta of 0.16 states there was a 16% chance the correlation in the sample will be smaller than 0.10 and not significant.

The alpha level was selected at .05, which indicates there are five chances in 100 that significant results could occur by chance alone. The effect size was small. The sampling method was random as data were gathered from every third subject whose chart met the study criteria.

Setting

The setting for the study was a county hospital in the Southwest area of the United States. This was a 550 bed teaching facility. Charts were reviewed in the medical records department.
Measurement Methods

The Numerical Rating Scale of Pain and the AHA descriptors of chest pain were used as measurement methods in this study. Measurement occurred through chart review only.

**Numerical Rating Scale**

The Numerical Rating Scale (NRS) for measurement of pain describes the severity of pain on an interval scale of zero to ten, with zero being no pain, and ten being the worst pain. This scale is used by paramedics and health care personnel to evaluate patients chest pain. This is a subjective non-visual scale used to determine the severity of the patients chest pain. The numerical rating scale is descriptive. The health care professional asks the subject to describe the pain the subject is feeling at the present time on a scale from zero to ten, with zero being no pain and ten being the worst possible pain. The highest level of pain recorded within the first 24 hours upon admission was used.

Downie, Leatham, and Rhind (1978), Kremer and Atkinson (1983), and Wallenstein (1980) demonstrate positive and significant correlations of this instrument with other measures of pain intensity.

Verbal descriptive scales (VDS) are easy to administer and score. According to Frank-Stromborg (1988), few authors using VDS have discussed reliability and validity, but most agree that a person's subjective rating is obtained of the pain intensity. Littman, Walker, and Schneider (1985) assessed a VDS, a visual scale (VAS) and a verbal pain relief scale using 1,497 subjects with acute and chronic pain. All three measures correlated
well with reliability of 0.89 to 0.93. The verbal pain relief scale was slightly more sensitive compared to the VDS and VAS.

Downie et al. (1978) examined validity of the VAS and VDS by comparing them to one another and to a 1-100 NRS. All the scores correlated well between 0.81-0.89 (p=0.01-0.001). The investigators concluded that the scales probably measured the same variable, pain intensity. See Appendix I, Measurement Tools, for the NRS used in data collection.

AHA Descriptors of Chest Pain

The AHA descriptors of chest pain were the second tool used to measure symptoms associated with a myocardial infarction. An analysis table was used to tabulate subjects’ frequencies of AHA descriptors. The subject’s description of the symptoms experienced was located in the emergency room records, nursing history and physical, nursing notes, physician’s history and physical, and the progress notes. Descriptors were tallied if present and left blank if not present. See Appendix I, Measurement Tools, for an example of the AHA format used in data collection.

Procedure

Chart Review

Subjects were initially located through use of the DRG codes via the computer in the medical record department. Logged information included the subject’s admitting diagnosis, admission date and time, medical record number, subject’s name, time and date of discharge, and discharge status. The sample was selected by medical diagnosis and
evidence of being male. All charts reviewed occurred after the patient had been discharged.

Charts were reviewed by the researcher in the medical records department. Only records for 1995-1996 were reviewed. Age and race were obtained from the face sheet in the front of the chart. Documentation of data regarding the American Heart Association descriptors were obtained from the ambulance record, emergency room forms, nursing flow sheets, and nursing admission history and physical form. Information was also obtained from the physician’s history and physical and progress notes. The analog rating pain scale is documented on the emergency room sheet and nursing notes.

The variables tobacco abuse, drug, and/or ETOH abuse, diabetes mellitus, and hypertension were located in the history and physical sheet and on the nursing admission sheet. CK-MB iso-enzymes were obtained from the laboratory section of the chart.

Back-up files were created and filed at the researcher’s residence. All data collected were housed at the researcher’s residence. There was no access of information provided to the general public.

The inter-rater was <1% error with random sampling performed between the same charts. Inter-rater reliability was established by having another nurse review 10 charts which the researcher had previously reviewed. This nurse was familiar with the charting system and hospital facility. Only one researcher collected the data. The researcher audited no more than fifteen charts per day to decrease error in data collection.

**Data Collection Form**

The data collection form for subjects are presented in Appendix II. The form
includes the variables addressed in this study and was used to collect data in conjunction with the Measurement Tools presented in Appendix I.

Ethical Considerations

Ethical considerations were reviewed and approved in the following order:

1) Thesis Committee, 2) The Department of Nursing at University of Las Vegas Human Right's Review committee, 3) and The University of Nevada, Las Vegas Human Right's Review Committee. The supervisor of Medical Records was issued a cover letter from the Director of Nursing identifying the researcher as having permission to review charts at the hospital facility, as well as a letter of permission from the Director of Medical Records. The researcher adhered to the format specified by University of Nevada in Las Vegas's Human Right's Review Committee.

Consent and Confidentiality

A subject's consent was not appropriate for this type of data collection. However, permission to review records from this facility was obtained from the Director of Nursing and the supervisor of Medical Records. See Appendix III for letters which requested and granted permission. Anonymity of the patients whose records were audited was protected by using the medical record numbers instead of names to ensure that no link could have been made between data and individual subjects. In addition, confidentiality was protected by reporting aggregate data for a group of subjects without reference to individual names.
Data Analysis

Presentation of the Data

Frequency distribution tables were calculated by race and the AHA descriptors and the Numerical Rate Scale results. Variables (age, smoking, hypertension, diabetes, drug abuse, alcohol abuse, and iso-enzyme levels) also were presented in a frequency table according to race.

Research Questions

The following statistical tests were used in addressing the seven research questions: chi-square, t-test, and correlation.

The first, third and fourth research questions employed chi-square analysis. These were:

1). Is there a difference in the type of myocardial infarction symptoms experienced by Black and White males?

3). Is there an incidence of smoking, diabetes, and hypertension among Black males compared to White males who have an acute myocardial infarction?

4). Is there a higher incidence of drug abuse and alcohol abuse between Black and White males who have had an acute myocardial infarction?

The chi-square test was used to analyze these research questions because the data are categorical (nominal level data). The descriptors were listed as present (yes) or not present (no). The frequencies in each group can be compared with the "expected" number (Ott, 1990). A resulting chi-square co-efficient with a .05 level of significance or less will
indicate there is a difference between Black and White males regarding the specified variables of these research questions.

The second and fifth research questions were addressed using the t-test. These questions were:

2). Is there a difference in cardiac iso—enzyme levels between Black and White males who have had an acute myocardial infarction?

5). Is there an age difference between Black males and White males who have had an acute myocardial infarction?

The t-test was used with interval level data (quantitative). The t-test assesses differences between group means (Burns, 1987). Therefore, the differences between Black and White male means were analyzed regarding age and iso-enzyme levels. A significance level of .05 was established.

Research questions six and seven utilized correlation for analysis. They were:

6). Is there a relationship between the level of pain in an acute myocardial infarction related to drug abuse or alcohol abuse?

A correlation matrix was computed and analyzed for correlations. Data are at the interval (levels of pain) and nominal levels. The Pearson product-moment correlation formula and variations were used in the analysis.

7). Is there a relationship between smoking, diabetes, or hypertension and the symptoms of an acute myocardial infarction?

Because all variables were qualitative (categorical), a phi-prime correlation coefficient was calculated for each of the variables. This test demonstrated if a relationship
existed between any of the variables and at what level.

Methodological Limitations

These study findings were limited because the non-random sample was drawn from only one hospital in one geographic area. Assumptions were made that subjects self-reported truthfully to all variables (i.e. smoking and drug usage) and understood the descriptors. It is assumed that intake was carefully obtained and not influenced by the interviewer’s bias at the time of hospitalization. The diagnosis of drug abuse or alcohol abuse was based solely on physician’s identification of subject as such in the history and physical.
CHAPTER V

DATA ANALYSIS

Introduction

This chapter addresses study findings related to the comparison of myocardial infarction symptoms, risk factors, and enzyme levels between Black and White males. Data from 138 patient charts were analyzed using chi-square analysis, t-tests, and correlation analysis. Statistical analyses are reported according to frequencies and outcomes related to the seven research questions. SPSS-PC was used to compute the tests and statistically analyze the data.

Characteristics of Sample

The sample consisted of 138 male patients who were medically diagnosed with myocardial infarction. Data collection occurred through chart review after patients had been discharged from a southwestern hospital setting. There were 96 White (69.6%) males and 42 Black (30.4%) males in the sample. The age range of the sample extended from 27 to 75 years of age. The mean age was 55 years old with a standard deviation of 9.89 years. The median and mode age was 55 years old. The most frequent age span (n=10) identified in the sample was from 51-55 (7.2%). (See Table 1).

Twenty eight of the male patients were diabetic (20.3%) while 110 were not
Seventy four patients (53.6%) presented with a history of hypertension. Sixty four patients (46.4%) had no documented history of hypertension. (See Table 2).

Eighty patients (58%) claimed to be smokers while fifty eight (42%) were noted as non tobacco users. Twenty two patients (15.9%) abused alcohol as defined by the definitions in this study. One hundred sixteen (84.1%) did not abuse alcohol. Only 7 patients were identified as drug abusers while the majority (n = 131) did not abuse drugs (94.9%). (See Table 2).

Major Study Variables

Major variables addressed in the study are Myocardial Infarction Symptoms, Levels of Pain, and Iso-Enzyme Levels.

Myocardial Infarction Symptoms (AHA)

The highest reported symptom of myocardial infarction in the sample was pain in the center of the chest (n = 108, 78.3%). Other symptoms frequently occurring were: shortness of breath (n = 72, 52.2%), sweating (n = 65, 47.1%), left arm pain (n = 57, 41.3%) and nausea (n = 49, 35.5%). Frequencies were recorded in all thirteen categories of myocardial infarction symptoms. The symptom least experienced by the sample was fainting (n= 3, 2.2%). (See Table 3).

Levels of Pain

Levels of pain reported by subjects ranged from 0 to 10. The mean pain level was 6.4 with a standard deviation of 3.13. The pain median was 8.0. The most frequently reported pain level (n=33) in the sample was 10 (n = 33, 23.9%). (See Table 4).
Iso-enzyme Levels

The cardiac iso-enzyme levels ranged from 3.3% to 31.1% elevation. The mean iso-enzyme level was 11.8% with a standard deviation of 5.7%. The median iso-enzyme level was 11%. The mode was determined to be 14.7%, and the most frequently elevated iso-enzyme category in the sample (n=4) was between 11-15 (29.19%). (See Table 5).

Research Question Findings

Research Question #1

Is there a difference in the type of myocardial infarction symptoms experienced by Black and White males?

A chi-square analysis using race and each of the myocardial symptoms was computed. The only significant difference noted in symptoms experienced between Black and White males was chest pain ($X^2 = 4.77$, $df = 1$, $p = .02$) and right arm pain ($X^2 = 7.14$, $df = 1$, $p = .007$). Twenty eight (66.7%) Black males experienced chest pain while eighty (83.3%) White males reported chest pain while having a myocardial infarction. Only one (2.4%) Black subject experienced right arm pain during a myocardial infarction, while 19 (19.8%) White subjects experienced right arm pain.

Chi-squares on the symptoms of dizziness, fainting, left arm pain, pressure, fullness, nausea, or neck pain indicated that there were no significant difference between races. (See Tables 6, 7, and 8).
Research Question #2

Is there a difference in cardiac iso-enzyme levels between Black and White males who have had an acute myocardial infarction?

The t-test results indicated no significant difference in cardiac iso-enzyme levels between Black and White males who have had an acute myocardial infarction. The mean of iso-enzyme levels for Black subjects was 10 with a standard deviation of 7.12. The mean of iso-enzyme levels for White subjects was 12 with a standard deviation of 5.01. The 2-Tail level of significance was .104 which is insignificant. (See Table 9).

Research Question #3

Is there a difference in the incidence of smoking, diabetes, and hypertension among Black males and White males who have an acute myocardial infarction?

Chi-square results did show a significance difference in the incidence of diabetes mellitus between Black and White males. Thirty-one percent of Black subjects (n = 13) had a history of diabetes compared to sixteen percent of White subjects (n = 15) reported a history of diabetes. The Pearson value was 4.2 with a degree of freedom 1 and a significance level of .03. (See Table 10).

There was no significant difference between Black and White males in regard to history of hypertension and smoking. The chi-square coefficient for hypertension and race was .845 (df = 1, p = .35). The chi-square coefficient for race and smoking was also insignificant (χ² = .017, df = 1, p = .89).

Research Question #4

Is there a difference in the incidence of drug abuse and alcohol abuse among Black
and White males who have had an acute myocardial infarction?

Chi-square results indicate there is a significant difference in incidence of drug abuse between Black and White males who have had an acute myocardial infarction ($X^2 = 5.85$, $df = 1$, $p = .01$). Blacks have a higher percentage of reported drug abuse (12%) than Whites (2%). (See Table 11). There was no significant difference between Black and White males in regard to alcohol abuse ($X^2 = 2.788$, $df = 1$, $p = .09$).

Research Question #5

Is there an age difference between Black males and White males who have had an acute myocardial infarction?

A t-test was computed to investigate race and age. The analysis revealed a difference in ages between Black and White males. The mean for Black subjects was 52 years of age with a standard deviation of 10.09. The White subjects’ mean age was 56 years with a standard deviation of 9.50. The 2-Tail significance was .009 which indicates a significant difference. (See Table 12).

Research Question #6

Is the level of pain related to race, or drug abuse, or alcohol abuse?

A correlation matrix was ran on the SPSS. The level of pain related to alcohol abuse was significant ($r = .179$, $p = .03$). There was no significant correlation between the level of pain and drug abuse ($r = -.072$, $p = .39$), or the level of pain and race ($r = .043$, $p = .61$). (See Table 13). In addition, a t-test indicated no significant difference ($t = -.50$, $p = .615$) between the level of pain which Black and White males experienced. The mean level of pain for Blacks was 7.23 while the mean level of pain for Whites was 7.53.
Research Question #7

Is there a relationship between smoking, diabetes, or hypertension, and the symptoms of an acute myocardial infarction?

A correlation matrix was computed to investigate whether the symptoms of a myocardial infarction were correlated with diabetes, smoking, or hypertension. Significant findings are reported in Table 15.

Diabetes was negatively correlated \((r = -0.002, \ p = .01)\) with shoulder pain \((r = -0.213, \ p = .01)\) and neck pain \((r = -0.203, \ p = .01)\) indicating that diabetics have less pain associated with these areas. Fullness was positively correlated with diabetes \((r = 0.164, \ p = .05)\). However, it needs to be noted that all correlations were weak.

Shortness of breath was positively correlated with smoking \((r = 0.360, \ p = .00)\) but negatively correlated with hypertension \((r = -0.221, \ p = .00)\). These results indicate that smokers have a greater incidence of shortness of breath than non-smokers and patients with hypertension have less shortness of breath than patients without hypertension.

Summary of Findings

The sample \((N = 138)\) consisted of 96 White males \((69.6\%)\) and 42 Black males \((30.4\%)\). The mean, median, and mode age were 55 years. Twenty percent \((n = 28)\) of the sample were diabetic, 54\% \((n = 74)\) were hypertensive, and 58\% \((n = 80)\) were smokers. Approximately 16\% of the sample abused alcohol \((n = 22)\), while 5\% were drug abusers \((n = 7)\).
The most frequently reported symptom of myocardial infarction using the AHA descriptors was pain in the center of the chest (n = 108, 78.3%). Other frequently occurring symptoms were shortness of breath, nausea, and left arm pain.

The mean level of highest pain recorded within the first 24 hours experienced by the sample was 6.4 on a scale of 0 - 10. The most frequently reported pain score was 10.

The mean level of cardiac iso-enzymes for the sample was 11.8%. Cardiac iso-enzyme levels ranged between 3.3% to 31.1%.

The first research question was tested with chi-square analysis. Black and White males were found to be different in regard to their experience of chest pain ($X^2 = 4.77, \ p = .02$) and right arm pain ($X^2 = 7.14, \ p = .007$).

The second research question, tested by t-test, indicated that there was no significant difference in cardiac iso-enzyme levels between Black and White males ($p = .104$).

The third research question investigated incidence of smoking, diabetes and hypertension between the two groups. Chi-square analysis indicated that Black subjects had a significantly higher incidence of diabetes than White subjects ($X^2 = 4.2, \ p = .03$). There was no significant difference between groups regarding hypertension or smoking.

The fourth research question also used chi-square analysis to evaluate whether Black and White subjects were different in incidence of drug and alcohol abuse. A significant finding ($X^2 = 5.85, \ p = .01$) was that Black males (12%) have a higher incidence of drug abuse than White males (2%).

The fifth research question addressed age differences. Results of the t-test revealed
that White subjects were older than Black subjects ($t = -2.66, p = .009$). The mean age of Whites was 56 years and the mean age of Blacks was 52 years.

The sixth research question utilized t-test and correlation analysis to investigate the relationship of pain to race, drug abuse, and alcohol abuse. Results of a t-test indicated no significant difference in pain levels between Black or White males ($t = -.50, p = .615$). Pain was significantly correlated with alcohol abuse ($r = .179, p = .03$), but not with drug abuse ($r = .072, p = .39$), or race ($r = .043, p = .61$).

The seventh research question used a correlation matrix to identify relationships between myocardial symptoms and smoking, diabetes, and hypertension. Diabetes was correlated with shoulder pain ($r = -.213, p = .01$), neck pain ($r = -.203, p = .01$), and fullness ($r = .164, p = .05$). Shortness of breath was correlated with smoking ($r = .360, p = .00$) and hypertension ($r = -.221, p = .00$).

**Summary**

This chapter presented the data analysis that examined characteristics of the sample. The sample was statistically described according to race and age, as well as incidence of diabetes mellitus and hypertension. Tobacco use, alcohol abuse, and drug abuse were also described.

The major study variables were discussed using descriptive statistics. These included symptoms of myocardial infarction, levels of pain, and iso-enzyme levels.

The seven research questions were answered by using chi-square analysis, t-test, and correlation. Results are presented using narrative and table format.
CHAPTER VI

SUMMARY OF THE STUDY

Introduction

This chapter summarizes the findings of the study in relationship to the purpose, literature review, and conceptual framework. Discussion of the research findings, limitations of the study, and conclusions are presented. Nursing implications and recommendations for additional nursing research complete the chapter.

Summary of Study

The purpose of this nursing study was to compare the signs and symptoms of Black and White males who had experienced an acute myocardial infarction. This focus was based upon a review of the literature which reported that Black males are more susceptible than White males to some diseases and may experience different symptoms. (AHA, 1992; Lee, 1997; Neill, 1987; Perkoff & Strand, 1973; Raczynski, 1994). In addition, the study examined the relationship between associated risk factors, cardiac isoenzyme levels, and pain levels among Black and White males. A pathophysiological model was used as the conceptual framework for the study. Demographics were limited to age (18 - 75 years), race (Black or White), and gender (males only) at a southwest county hospital. The five variables (diabetes mellitus, hypertension, tobacco use, drug abuse, and
alcohol abuse) are cardiovascular risk factors which may promote a myocardial infarction as depicted by the model. The model presents outcomes associated with a myocardial infarction as enzyme levels, symptoms, and levels of pain.

One hundred thirty eight charts were pulled to ascertain if the patient met criteria for the study. By use of random sampling, charts were selected from a computer readout sheet and were reviewed in the hospital’s medical records department. The Measurement Tool Form and the Data Collection Sheet Form were used in the collection of data.

Data analysis included frequencies of the AHA descriptors, the Numerical Rating Scale results, race, age, cardiac iso-enzyme levels, and associated risk factors. Three t-tests were done to determine if there were significant differences in age, in pain levels, or in cardiac iso-enzyme levels between Black and White males who had an acute myocardial infarction. Chi-square analysis was used to determine if there was a difference in: 1) type of myocardial infarction symptoms experienced by Black and White males, 2) the incidence of smoking, diabetes, and/or hypertension among Black and White males, and 3) the incidence of drug abuse and alcohol abuse between Black and White males. Correlation studies were done to determine if any significant correlation existed between the level of pain experienced in relationship to race, drug abuse or alcohol abuse. Also investigated were correlations between smoking, diabetes, hypertension, and the symptoms of an acute myocardial infarction.

To summarize results, some variations were found in the presentation of myocardial infarction symptoms and associated risk factors between Black and White males. There were more White males than Black males in this sample. The age difference
between Black and White males was significant with Black males being approximately four years younger than the White males. Black males experienced diabetes twice as much as White males. Hypertension was present in more than half of the total sample. Tobacco use was also present in more than half of the total sample. Tobacco use displayed a relationship with neck pain, shortness of breath, and sweating. A significant difference between Black and White males, was found regarding drug abuse: Blacks had a higher percentage. More White males experienced chest pain than Black males. White males experienced right arm pain more than Black males. There was no significant difference in cardiac iso-enzyme levels, or pain levels, between Black and White males.

Discussion of Findings

The findings of this study are supported by the results of earlier studies and by the pathophysiological model. Conclusions will be introduced according to the relevant findings.

Myocardial Infarction, Race, and Age

National statistics reported by the AHA (1992) indicate that deaths from cardiovascular diseases in 1992 included 40.7% White males and 32.6% Black males. Frequencies in this study also demonstrated a higher percentage of White males which reflects the population's racial distribution. The researcher found the ratio of Whites to Blacks in the hospital population from which the sample was drawn approximately to be 5:1.

In this study, the mean age was 52 years for Blacks and 55 years for Whites. Why
are Blacks younger than Whites? Results of this study showed that Blacks had a higher incidence of diabetes and drug abuse. Both these factors add stress to the heart possibly promoting a myocardial infarction to occur at an earlier age.

The AHA (1992) reported that 38% of deaths from cardiovascular diseases occurred prematurely (i.e., before age 75, the average life expectancy in that year). The AHA reported that total deaths from cardiovascular diseases were increased due to growth of the total United States population, and particularly due to the increase in the population of middle-aged and older people. Another reason mentioned was that medical advancement and technology allow more people to survive previously fatal cardiovascular events, but these people now die of subsequent chronic cardiovascular illnesses.

Symptoms of a Myocardial Infarction

In the present study, chest pain and right arm pain were the only two symptoms of a myocardial infarction which were experienced differently between Black and White males. Clark (1989) among other researchers mentioned that White patients are most likely to complain of chest pain, while Black patients have a lower incidence of chest pain or discomfort and a higher incidence of dyspnea. The findings of this study found that Black and White males both experienced chest pain, however, White males had a higher percentage. Neill’s study (1993) indicated that Black males had significantly more shortness of breath than White males, but this difference was not collaborated in this study. There were no other significant differences between Black and White males in the type of myocardial symptoms experienced.

The researcher was aware that descriptions of the experienced symptom may have

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been related incorrectly from the subject to the health professional. Information in the chart may have been transcribed in the wrong place or inaccurately. To compound the issue, studies have found that Black male patients may withhold information from health professionals in order to test their skill level, competency and/or judgment (Crawford, 1994). The patient might even judge the treatment or care received on his first medical visit with skepticism making him lose faith and fail to return again. Also, communication style and terminology may be different between Black and White Americans which may lead to misinterpretations. The Black American community has been noted, generally speaking, as being loud and to the point, whereas, the White American middle-class mode has been labeled low-keyed and lacking in affect according to Kochman (1981).

Known Risk Factors

Diabetes, hypertension, and smoking have been discussed in several studies as risk factors promoting myocardial infarction. The present study revealed that race is significantly correlated with diabetes mellitus. This finding is supported by the Department of Health and Human Services (1990) which states that diabetes mellitus is 33% more prevalent in Blacks than in Caucasians in the United States.

In this study, diabetes was significantly related to shoulder pain, neck pain, and fullness. Fullness may be related to a decreased pain sensation due to neuropathy which may develop from the diabetes mellitus. Inferior myocardial infarctions can also cause a feeling of fullness or indigestion from irritation on the top of the stomach and apex of the heart. Hypertension and smoking were significantly, but weakly, correlated with shortness
of breath in the present study. As discussed earlier, hypertension can cause CHF which can be a precursor of an acute myocardial event. Curry (1991) stated cigarette smoking contributes to a higher level of coronary artery disease. The nicotine in cigarette smoking constricts blood vessels, increasing blood pressure, thus increasing afterload which increases the work of the left ventricle (Bullock, 1992).

Drug and Alcohol Abuse

Drug and alcohol abuse have not been proven to promote myocardial infarction but may act as stressors on the myocardium. The researcher made an assumption that the subject was answering truthfully when asked to describe the symptoms or to give history, such as tobacco use, and drug and/or alcohol abuse. The chi-square results need to be interpreted with caution because there were only 2 White drug abusers in the sample. There were more Black drug abusers than Whites, even though the Black sample size was smaller.

Pain Scale

Using the Numerical Rating Scale, the mean pain level was 6 for both Black and White males; no significant difference in pain level between Black and White males was indicated by results of the t-test. The pain scale was verbally described to the subject at the time of admission. The researcher understands the differences in perceived level of pain. Diabetes mellitus, alcohol, and drugs may also impair the subject’s perception of pain. The length of time that the pain was experienced was unknown. Theoretically, in this study, pain levels are subjective perceptions of discomfort related to disease or injury which are transmitted via the nervous system.
Limitations

A limitation of the study includes the small and unequal sampling of Black and White males from only one hospital. The results cannot be generalized throughout the states, or even the city, because of its limited sampling. Black males sampled were a smaller sized group than White males sampled due to the smaller hospital population of Black myocardial infarction patients where data was gathered.

Conclusions

Following consideration of the findings and limitations of the present study the following conclusions can be generalized to the sample:

1. Black and White patients differ in their experience of myocardial symptoms in regard to chest pain and right arm pain. White males have a significantly higher incidence of chest pain and right arm pain.

2. Black subjects have a greater incidence of diabetes mellitus and drug abuse than White subjects.

3. White myocardial patients are older than Black myocardial patients.

4. There is a positive relationship between smoking and shortness of breath in myocardial male patients.

Results of the study indicate support of the model which was used as the conceptual framework. Figure 2 on page 52 depicts the variables found to be significant.
Predisposing Risk Factors

- AGE
- DIABETES MELLITUS
- SMOKING
- ALCOHOL ABUSE

Measurements of a Myocardial Infarction

Figure 2 Conceptual Framework Depicting Variables Found To Be Significant.
Implications for Nursing

As well documented in the literature and this study, nurses should remain aware of the associated risk factors which can promote a myocardial infarction. Health care workers should be aware of the multiple presenting symptoms of a myocardial infarction and incorporate this knowledge while assessing the patient, planning and intervening. Nurses need to be especially alert to the fact that Black males tend to have fewer complaints of chest pain while experiencing a myocardial infarction.

The American Heart Association recognizes right arm pain as a possible symptom of a myocardial infarction. Society and health care workers should consider the possibility of a myocardial infarction in addition to other types of referred pain, such as gallbladder disease or appendicitis (Bullock, 1992). Atypical signs and symptoms can present confusion to the public and health care workers upon initial treatment and diagnosis.

Diabetes is more prevalent in Blacks than Whites. Health care workers need to be aware that diabetes may alter the presenting symptoms of a myocardial infarction. In the diabetic, shoulder pain, fullness, and absence of chest pain may be related to a myocardial infarction. Nurses need to know the importance of obtaining sufficient history information and should remember that chest pain may be absent secondary to neuropathy.

This study examined hypertension as a risk factor. Hypertension is more prevalent in Blacks than Whites (AHA, 1992). Nurses need to be aware that a myocardial infarction may be occurring when shortness of breath or pressure is present. Nurses can help educate the public that chest pain need not be present when a myocardial infarction is occurring.
Smokers have an increased risk of cardiovascular disease. Symptoms such as sweating and neck pain may be related to smoking in the patient presenting with a myocardial infarction. Health care workers and the public need to consider the social and physical symptoms associated with smoking. Continuous education and health promotion activities need to be implemented nationally to decrease smoking.

Nurses need to remember that pain can be a decreased sensation or may be even more tolerable when alcohol is present. Health care professionals, when doing assessments, should consider the concept of decreased sensation of pain when alcohol is present. Lastly, nurses should not be judgemental of drug abusers, especially in the emergency room. The behavior of the patient should never prevent competent assessment and diagnosis from occurring.

Recommendations for Further Research

If replicated, this study should use a larger sample involving other hospitals to obtain a greater number and variety of demographic variables. Questionnaires to patients are recommended instead of chart reviews as a method for collecting data.

Cultural differences were not evaluated which could have a large impact on perceived pain. Bates (1987) stated pain response behavior is a product of “sociocultural structuring of cognition on physiological mechanisms of pain perception.” This could also influence how one follows up with treatment such as, medication, diet and exercise. Social Economic Status (SES) may have an influence on pain perception and needs to be researched further. Dodson (1981) stated that the higher the socio-economic status in
Black Americans, the greater the individuals' ability to cope.

A larger sample of drug abusers needs to be obtained for accurate interpretation of a relationship between pain levels and drug abuse. A study done in different geographical areas of the United States, or various countries would be interesting. Clients from Southern states may compare pain levels differently than clients from Western states.

A larger sample of Black and Whites need to be studied. Eighty three Black charts were pulled but only 42 met criteria for this study. White charts were easily obtained.

The researcher needs to study how long the patient has had risk factors, such as hypertension or diabetes mellitus, before having a myocardial infarction. Diabetic neuropathy may mask the pain levels of a myocardial infarction if the patient has had diabetes mellitus over many years. The study should also examine if the myocardial infarction was the first occurrence versus a reoccurrence.

Review of the literature has noted that delays in health seeking behavior occur. Studies should be done to see when myocardial infarction associated pain started, rationale for waiting, presentation of symptoms, and the thought process of the patient in relationship to what caused the pain. Do the same presentation of symptoms cause individuals to seek medical help in the same length of time? Answers to these questions could reveal important information and insights for nurses and the health care team.

Efficient competent assessment and treatment of myocardial infarction symptoms will lead to improved patient outcomes. This study has emphasized the importance of racial consideration in the care of patients who have, or possibly have, a myocardial infarction.
References


*Postgraduate Medicine, 91*(5), 271-277.


and Bartlett Publishers, Inc.


Issues vol. 8*, pp.16-30.

APPENDIX A

University of Nevada, Las Vegas

Department of Nursing

Human Subjects Rights Committee

Approval Letters
Title of Project: Comparison of myocardial infarction symptoms, risk factors and enzyme levels between black and white males.

Investigator: Sharon L. Mallory, RN, BSN and Susan Kowalski, RN, PhD

After reviewing this proposal, the members of the Department of Nursing, Human Subjects Rights Review Committee have indicated below their approval/disapproval of this proposal.

Signature of Committee Members  

---------------------------  

[Signature]  

---------------------------  

[Signature]  

The above named project is hereby approved/disapproved (circle one).

Date: 20 Feb 1987

Committee Chairperson's Signature
21 February 1997

Sharon Mallory, RN, BSN
4243 Famoso Drive
North Las Vegas, NV 89030

Dear Ms. Mallory:

The Department of Nursing Human Subjects Rights Committee met and approved your proposal "Comparison of myocardial infarction symptoms, risk factors and enzyme levels between black and white males" with the following additions:

1. Obtain approval of HSR at UMC or document why you do not have to gain this approval.
2. To Benefits, add how the outcome of this study can be used by nurses in triage and other nursing assessment.
3. Under Risks, either identify what you mean by "Time will not ... auditing." or delete. The Committee assumes you are not doing the data collection on work time.

With the above revisions you may take your proposal to the University Office of Sponsored Programs for their consideration. You have a study that should result in useful information for nursing. The Committee wishes you well in completing it. If any of the above is not clear or you wish to discuss any of the points please do not hesitate to call myself or any of the other committee members.

We wish you well in completing your study and are looking forward to hearing about your findings.

If you make any major change in your project please notify the Committee.

Sincerely,

Margaret Louis, RN PhD
Chairperson
Human Subjects Rights Committee
Department of Nursing

Department of Nursing
4505 Maryland Parkway • Box 453018 • Las Vegas, Nevada 89154-3018
(702) 895-3360 • FAX (702) 895-4807
APPENDIX B

University of Nevada, Las Vegas

Human Subjects Institutional Review Board

Approval Letter
DATE: February 28, 1997

TO: Sharon Mallory (NUR)  
M/S 3018

FROM: Dr. William E. Schulze, Director  
Office of Sponsored Programs (X1357)

RE: Status of Human Subject Protocol Entitled:  
"Comparison of Myocardial Infarction Symptoms, Risk  
Factors, and Enzyme Levels Between Black and White  
Males"

OSP #501s0297-194e

The protocol for the project referenced above has been reviewed by the Office of Sponsored Programs and it has been determined that it meets the criteria for exemption from full review by the UNLV human subjects Institutional Review Board. This protocol is approved for a period of one year from the date of this notification and work on the project may proceed.

Should the use of human subjects described in this protocol continue beyond a year from the date of this notification, it will be necessary to request an extension.

cc: S. Kowalski (NUR-3018)  
OSP File
APPENDIX C

Approval Letters from Hospital

Director of Nursing

Educational Coordinator

Medical Records Supervisor
CONSENT LETTER to DIRECTOR OF NURSING

Sharon L. Mallory R.N., B.S.N.
4243 Famoso Dr.
No. Las Vegas, NV 89030
(702) 631-6677

February 12, 1997

Mrs. Mardy Marrett
1800 West Charleston
Las Vegas, NV 89102

Dear Mrs. Marrett,

May I have your written consent to review charts at this facility's Medical Records to obtain data for my thesis: Comparison of symptoms, risk factors, and enzyme levels between Black and White males experiencing a myocardial infarction. Extreme confidentiality will be maintained by using number codes, not names. I am currently enrolled in the University of Nevada, Las Vegas nursing master's program and would appreciate your consent. If there should be any questions regarding this study, the University of Nevada Las Vegas Office of Sponsored Programs (OSP) phone number is (702) 895-1357.

Thank you for your support.

Sincerely,

Sharon L. Mallory R.N., B.S.N.

I, [Signature], give Sharon L. Mallory R.N., B.S.N. permission to review charts at University Medical Center Medical Records for her thesis at University Nevada of Las Vegas.

Date: 2-18-97

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CONSENT LETTER to NURSING EDUCATION

Sharon L. Mallory R.N., B.S.N.
4243 Famoso Dr.
No. Las Vegas, NV. 89030
(702) 631-6677

March 10, 1997

Mrs. Elaine Young
1800 West Charleston
Las Vegas, NV. 89030

Dear Mrs. Young,

May I have your written consent to review charts at this facility’s Medical Records to obtain data for my thesis: Comparison of symptoms, risk factors, and enzyme levels between Black and White males experiencing a myocardial infarction. Extreme confidentiality will be maintained by using number codes, not names. I am currently enrolled in the University of Nevada, Las Vegas nursing master's program and would appreciate your consent without going through the University Medical Center’s Human Right Subject Committee. The University of Nevada Las Vegas Office of Sponsored Programs (OSP) phone number is (702) 895-1357, if there would be any questions.

Thank you for your support.

Sincerely,

Sharon L. Mallory R.N., B.S.N.

I, Margret Young, give Sharon L. Mallory R.N., B.S.N. consent to review charts at University Medical Center Medical Records without going through the Human Rights Subject Committee for her thesis at University Nevada of Las Vegas.

Date: 3-11-97

Department of Nursing
4505 Maryland Parkway • Box 453018 • Las Vegas, Nevada 89154-3018
(702) 895-3360 • FAX (702) 895-4807

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PERMISSION LETTER to MEDICAL RECORD SUPERVISOR

Sharon L. Mallory R.N., B.S.N.
4243 Famoso Dr.
No. Las Vegas, NV. 89030
(702) 631-6677

February 12, 1997

Mrs. Hope Hammond
1800 West Charleston
Las Vegas, NV. 89102

Dear Mrs. Hammond,

I have received permission from Mardy Marrett, Director of Nursing, to review charts at this facility's Medical Records to obtain data for my thesis: Comparison of symptoms, risk factors, and enzyme levels between Black and White males. Extreme confidentiality will be maintained by using subject codes, not names. I am currently enrolled in the University of Nevada, Las Vegas nursing master's program and would appreciate your consent.

Thank you for your support.

Sincerely,

Sharon L. Mallory R.N., B.S.N.

I, ___________ Hammond, give Sharon L. Mallory R.N., B.S.N. permission to review charts at University Medical Center Medical Records for her thesis at University Nevada of Las Vegas.

Date: 2/18/97

Office of Sponsored Programs
4505 Maryland Parkway • Box 451037 • Las Vegas, Nevada 89154-1037
(702) 895-1357 • FAX (702) 895-4242

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DATA COLLECTION FORM

SUBJECT CODE NUMBER ____________________

HOSPITAL ADMISSION NUMBER _____________

RACE: BLACK__________ WHITE___________

AGE:______________ YEARS OLD

DIABETES MELLITUS: ____________ YES ______________ NO

HYPERTENSION ________________ YES _________________________ NO

SMOKER ________________ YES ________________ NO

ALCOHOL ABUSE ________________ YES ________________ NO

DRUG ABUSE ________________ YES ________________ NO

HIGHEST LEVEL OF REPORTED CK-MB ISO-ENZYMES ____________

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### Measurement Tools

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<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

### American Heart Descriptors

<table>
<thead>
<tr>
<th>SYMPTOMS</th>
<th>BLACK</th>
<th>WHITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNCOMFORTABLE PRESSURE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULLNESS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQUEEZING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAIN CENTER OF THE CHEST</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAIN SPREADING TO SHOULDERS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAIN IN NECK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAIN IN ARMS R  L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAUSEA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWEATING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHORTNESS OF BREATH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAINTING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEST DISCOMFORT WITH LIGHTHEADDENESS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variables</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-30</td>
<td>3</td>
<td>2.1%</td>
</tr>
<tr>
<td>31-35</td>
<td>2</td>
<td>1.4%</td>
</tr>
<tr>
<td>36-40</td>
<td>6</td>
<td>4.3%</td>
</tr>
<tr>
<td>41-45</td>
<td>11</td>
<td>8.0%</td>
</tr>
<tr>
<td>46-50</td>
<td>18</td>
<td>13.0%</td>
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<td>51-55</td>
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<td>61-65</td>
<td>23</td>
<td>16.6%</td>
</tr>
<tr>
<td>66-70</td>
<td>16</td>
<td>11.5%</td>
</tr>
<tr>
<td>71-75</td>
<td>6</td>
<td>4.2%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black (n = 42)</td>
<td>42</td>
<td>30.4%</td>
</tr>
<tr>
<td>White (n = 96)</td>
<td>96</td>
<td>69.6%</td>
</tr>
</tbody>
</table>

**Note.** Age: SD = 9.89, range 27 -75 years of age; From the Data Collection Form
Table 2

Frequencies of Diabetes Mellitus, Hypertension, Tobacco Abuse, Alcohol Abuse, and Drug Abuse

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diabetes Mellitus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>28</td>
<td>20.3%</td>
</tr>
<tr>
<td>Not Present</td>
<td>110</td>
<td>79.7%</td>
</tr>
<tr>
<td><strong>Hypertension</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>74</td>
<td>53.6%</td>
</tr>
<tr>
<td>Not Present</td>
<td>64</td>
<td>46.4%</td>
</tr>
<tr>
<td><strong>Tobacco Abuse</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>80</td>
<td>58%</td>
</tr>
<tr>
<td>Not Present</td>
<td>58</td>
<td>42%</td>
</tr>
<tr>
<td><strong>Alcohol Abuse</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>22</td>
<td>15.9%</td>
</tr>
<tr>
<td>Not Present</td>
<td>116</td>
<td>84.1%</td>
</tr>
<tr>
<td><strong>Drug Abuse</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>7</td>
<td>5.1%</td>
</tr>
<tr>
<td>Not Present</td>
<td>131</td>
<td>94.9%</td>
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</tbody>
</table>

*Note:* From the Data Collection Sheet.
Table 3

Frequencies of Myocardial Infarction Symptoms (N = 138)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequencies of Symptoms</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain in Center of Chest</td>
<td>108</td>
<td>78.3%</td>
</tr>
<tr>
<td>Shortness of Breath</td>
<td>72</td>
<td>52.2%</td>
</tr>
<tr>
<td>Sweating</td>
<td>65</td>
<td>47.1%</td>
</tr>
<tr>
<td>Pain in Left Arm</td>
<td>57</td>
<td>41.3%</td>
</tr>
<tr>
<td>Nausea</td>
<td>49</td>
<td>35.5%</td>
</tr>
<tr>
<td>Pain in Neck</td>
<td>27</td>
<td>19.6%</td>
</tr>
<tr>
<td>Uncomfortable Pressure</td>
<td>23</td>
<td>16.7%</td>
</tr>
<tr>
<td>Pain to Shoulders</td>
<td>21</td>
<td>15.2%</td>
</tr>
<tr>
<td>Pain in Right Arm</td>
<td>20</td>
<td>14.5%</td>
</tr>
<tr>
<td>Fullness</td>
<td>12</td>
<td>8.7%</td>
</tr>
<tr>
<td>Squeezing</td>
<td>10</td>
<td>7.2%</td>
</tr>
<tr>
<td>Chest Discomfort with Lightheadedness</td>
<td>8</td>
<td>5.8%</td>
</tr>
<tr>
<td>Fainting</td>
<td>3</td>
<td>2.2%</td>
</tr>
</tbody>
</table>

Note. From the American Heart Descriptors
Table 4

**Level of Pain Frequencies (N = 138)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Central Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6</td>
<td>4.3%</td>
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</tr>
<tr>
<td>1</td>
<td>8</td>
<td>5.8%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>4.3%</td>
<td>Mean: 6.44</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>7.2%</td>
<td>Mode: 10.0</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>7.2%</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>8.0%</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>6.5%</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>5.1%</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>31</td>
<td>22.5%</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>5.1%</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>33</td>
<td>23.9%</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* From the Measurement Tool Sheet (Using the Numerical Pain Rating Scale).
### Table 5

**Frequencies of Cardiac Iso-Enzyme Levels (N = 138)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac Iso-Enzyme Percent Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 5.9</td>
<td>26</td>
<td>18.4%</td>
</tr>
<tr>
<td>6 - 10.9</td>
<td>41</td>
<td>28.9%</td>
</tr>
<tr>
<td>11 - 15.9</td>
<td>41</td>
<td>29.1%</td>
</tr>
<tr>
<td>16 - 20.9</td>
<td>25</td>
<td>18.5%</td>
</tr>
<tr>
<td>21 - 25.9</td>
<td>1</td>
<td>7%</td>
</tr>
<tr>
<td>26 - 30.9</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>31 - 35.9</td>
<td>3</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

**Note.** CK-MB’s of 3.3% must be obtained to verify a myocardial infarction. Cardiac Iso-Enzyme Levels: Mean = 11.8%, SD = 5.72, range 3.3% to 31.1% CK-MB’s; From the Data Collection Form.
Table 6

Chi-square Results of Chest Pain and Race (N = 138)

<table>
<thead>
<tr>
<th>Variable</th>
<th>No Chest Pain</th>
<th>Experienced Chest Pain</th>
<th>Row Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>14</td>
<td>28</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>33.3%</td>
<td>66.7%</td>
<td>30.4%</td>
</tr>
<tr>
<td>White</td>
<td>16</td>
<td>80</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>16.7%</td>
<td>83.3%</td>
<td>69.6%</td>
</tr>
<tr>
<td>Column Total</td>
<td>30</td>
<td>108</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>21.7%</td>
<td>78.3%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note. $X^2 = 4.77$, df = 1, $p = .02$ (Data collected using the AHA Descriptors of Myocardial Symptoms).
Table 7

**Chi-square Results of Right Arm Pain and Race (N = 138)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>No Right Arm Pain</th>
<th>Experienced Right Arm Pain</th>
<th>Row Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>41</td>
<td>1</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>35.9%</td>
<td>2.4%</td>
<td>30.4%</td>
</tr>
<tr>
<td>White</td>
<td>77</td>
<td>19</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>80.2%</td>
<td>19.8%</td>
<td>69.6%</td>
</tr>
<tr>
<td><strong>Column Total</strong></td>
<td>118</td>
<td>20</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td><strong>85.5%</strong></td>
<td><strong>14.5%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Note. $X^2 = 7.14$, df = 1, $p = .00$ (Data collected using the AHA Descriptors of Myocardial Infarction Symptoms).
### Table 8

**Chi-square Results of Other Myocardial Symptoms and Race (N = 138)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$X^2$</th>
<th>df</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncomfortable Pressure</td>
<td>.24</td>
<td>1</td>
<td>.61</td>
</tr>
<tr>
<td>Fullness</td>
<td>.78</td>
<td>1</td>
<td>.37</td>
</tr>
<tr>
<td>Squeezing</td>
<td>.55</td>
<td>1</td>
<td>.45</td>
</tr>
<tr>
<td>Pain to Shoulders</td>
<td>1.51</td>
<td>1</td>
<td>.21</td>
</tr>
<tr>
<td>Pain to Neck</td>
<td>2.25</td>
<td>1</td>
<td>.13</td>
</tr>
<tr>
<td>Pain in Left Arm</td>
<td>2.66</td>
<td>1</td>
<td>.10</td>
</tr>
<tr>
<td>Nausea</td>
<td>.54</td>
<td>1</td>
<td>.45</td>
</tr>
<tr>
<td>Sweating</td>
<td>3.14</td>
<td>1</td>
<td>.07</td>
</tr>
<tr>
<td>Shortness of Breath</td>
<td>.16</td>
<td>1</td>
<td>.68</td>
</tr>
<tr>
<td>Fainting</td>
<td>.01</td>
<td>1</td>
<td>.91</td>
</tr>
<tr>
<td>Chest Discomfort with Lightheadedness</td>
<td>1.02</td>
<td>1</td>
<td>.59</td>
</tr>
</tbody>
</table>

**Note:** All chi-squares are insignificant, indicating there are no differences between race in experience of these symptoms. (Data collected using AHA Descriptors of Myocardial Infarction Symptoms).
### Table 9

**t-Test Results of Cardiac Iso-Enzyme Levels between Black and White Males (N = 138)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Cases</th>
<th>Mean</th>
<th>SD</th>
<th>SE of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>CK-MB Levels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>42</td>
<td>10.66</td>
<td>7.12</td>
<td>1.08</td>
</tr>
<tr>
<td>White</td>
<td>96</td>
<td>12.38</td>
<td>5.01</td>
<td>.51</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variance</th>
<th>t-value</th>
<th>df</th>
<th>2-Tail Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal</td>
<td>-1.64</td>
<td>136</td>
<td>.10</td>
</tr>
</tbody>
</table>

**Note.** $F = 1.88, p = .27$. The F-value is a test of the assumptions of homogeneity of variance.
Table 10

Chi-square Results of Diabetes Mellitus and Race (N = 138)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Does Not Have Diabetes</th>
<th>Has Diabetes</th>
<th>Row/Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>29</td>
<td>13</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>69%</td>
<td>31%</td>
<td>30.4%</td>
</tr>
<tr>
<td>White</td>
<td>81</td>
<td>15</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>84.4%</td>
<td>15.6%</td>
<td>69.6%</td>
</tr>
<tr>
<td>Column Total</td>
<td>110</td>
<td>28</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>94.9%</td>
<td>5.1%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note. $X^2 = 4.24$, df = 1, $p = .03$
Table 11

**Chi-Square Test Results of Drug Abuse and Race (N = 138)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>No Drug Abuse</th>
<th>Drug Abuse</th>
<th>Row Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>37</td>
<td>5</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>88.1%</td>
<td>11.9%</td>
<td>30.4%</td>
</tr>
<tr>
<td>White</td>
<td>94</td>
<td>2</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>97.9%</td>
<td>2.1%</td>
<td>69.6%</td>
</tr>
<tr>
<td><strong>Column Total</strong></td>
<td><strong>131</strong></td>
<td><strong>7</strong></td>
<td><strong>138</strong></td>
</tr>
<tr>
<td></td>
<td>94.9%</td>
<td>5.1%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note. $X^2 = 5.85$, df = 1, $p = .01$
Table 12

_t-Test Results of Age Difference between Black and White Males (N = 138)_

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Cases</th>
<th>Mean</th>
<th>SD</th>
<th>SE of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>42</td>
<td>52.14</td>
<td>10.09</td>
<td>1.55</td>
</tr>
<tr>
<td>White</td>
<td>96</td>
<td>56.90</td>
<td>9.50</td>
<td>.97</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variance</th>
<th>t-value</th>
<th>df</th>
<th>2-Tail Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal</td>
<td>-2.66</td>
<td>136</td>
<td>.00</td>
</tr>
</tbody>
</table>

*Note.* F = .69, p = .40. The F-value is a test of the assumptions of homogeneity of variance.
Table 13

Correlation Analysis: Results between Pain, Race, Alcohol Abuse, and Drug Abuse

(N = 138)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pain</th>
<th>Race</th>
<th>Drug</th>
<th>Alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>.04</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug</td>
<td>.07</td>
<td>-.20**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td>.17*</td>
<td>-.14</td>
<td>.35***</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note: * $p = .03$, ** $p = .01$, *** $p = .00$
Table 14

**Results of t-Test Analysis: Level of Pain and Race (N= 138)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Cases</th>
<th>Mean</th>
<th>SD</th>
<th>SE of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>42</td>
<td>7.23</td>
<td>3.13</td>
<td>.48</td>
</tr>
<tr>
<td>White</td>
<td>96</td>
<td>7.53</td>
<td>3.15</td>
<td>.32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variance</th>
<th>t-value</th>
<th>df</th>
<th>2-Tail significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal</td>
<td>-.50</td>
<td>136</td>
<td>.61</td>
</tr>
</tbody>
</table>

**Note:** F = .01, p = .90. The F-value is a test of the assumptions of homogeneity of variance. (Data collected using Numerical Pain Rating Scale).
Table 15

Results of Correlation Matrix: Relationship between Diabetes, Smoking, Hypertension, and the Symptoms of an Acute Myocardial Infarction ($N = 138$)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Diabetes</th>
<th>Smoking</th>
<th>Hypertension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain to Shoulders</td>
<td>-.21 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fullness</td>
<td>.16 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain in the Neck</td>
<td>-.20 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shortness of Breath</td>
<td>.36 *</td>
<td></td>
<td>-.22 *</td>
</tr>
</tbody>
</table>

*Note: * $p = .00$, ** $p = .01$, *** $p = .05$ Only significant values are presented.