FACTORS IN SEEKING EMERGENT TREATMENT FOR SYMPTOMS OF ACUTE CORONARY SYNDROME IN THE AMERICAN INDIAN POPULATION

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# TABLE OF CONTENTS

## LIST OF ILLUSTRATIONS

- ABSTRACT

## CHAPTER ONE: INTRODUCTION

- Statement of the Problem
- Purpose
- Background
  - Acute Coronary Syndrome
  - Unstable Angina/Non-ST-Elevation Myocardial Infarction
  - ST-Elevation Myocardial Infarction
  - Availability of Services on the Navajo Reservation
  - Transportation/Transfer Issues
- Significance to Nursing
- Specific Aims
- Definition of Terms
- Summary

## CHAPTER TWO: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

- Theoretical Framework: Leventhal’s Common Sense Model of Illness Representation
- Literature Review
  - Cardiovascular Disease and the AIAN
  - Racial Misclassification
  - Time to Seeking Care for ACS
  - Barriers to Care
  - Knowledge of ACS Symptoms
  - Health Promotion
- Gaps in Knowledge
- Research Recommendations
- Summary

## REFERENCES
LIST OF ILLUSTRATIONS

FIGURE 1. A Thematic Map of American Indian Reservations in Arizona ..........................9

FIGURE 2. A Thematic Map of the Navajo Nation, U.S.A., Public Health Service (PHS), Indian Health Service Units. ..............................................................................................15

FIGURE 3. A Schematic Representation of Leventhal’s CSM of Illness Representation........23
ABSTRACT

Cardiovascular disease (CVD) has been the number one cause of death in the American Indian and Alaskan Natives (AIAN) for decades and is an adverse health disparity for this population. While CVD encompasses a group of disorders of the heart and blood vessels, this report focuses on the acute coronary syndrome (ACS) aspect of CVD. The purpose of this report is to describe the theoretical framework and a review of literature for a planned Practice Inquiry to examine: 1) presenting symptoms of ACS and factors determining the decision to seek treatment, 2) factors associated with pre-hospital delay, and 3) knowledge of ACS in the AI population. The background includes a description of ACS and its components (unstable angina, non-ST-elevation myocardial infarction, ST-elevation myocardial infarction), availability of services on the Navajo reservation, transportation/transfer challenges related to seeking care, and problems encountered when transferring patients off the reservation for reperfusion therapy. The theoretical framework of the planned study will be based on Leventhal’s Common Sense Model of Illness Representation. The review of literature addresses CVD in the AI, time to seeking care for ACS, barriers to care, health promotion, and increasing awareness of CVD and ACS in the AI population. The literature review identifies gaps in knowledge and indicates areas for research. It is proposed that the results of the planned Practice Inquiry will assist rural health care providers in developing a culturally-sensitive, community-based education program directed toward the AI population to increase AI awareness of CVD and ACS symptoms.
CHAPTER ONE: INTRODUCTION

The purpose of this report is to describe the theoretical framework and a review of literature for a planned Practice Inquiry study to examine: 1) presenting symptoms of ACS and factors determining the decision to seek treatment, 2) factors associated with pre-hospital delay, and 3) knowledge of ACS in the AI population. Chapter one provides a statement of the problem, the purpose of this master’s report, background, significance to nursing, and questions guiding this report.

Statement of the Problem

There are 4.1 million AIAN in the United States (U.S. Census Bureau, 2003). In this population, CVD and cerebrovascular diseases are the first and fifth leading causes of death (Heron, 2007). Approximately 30% of AI deaths for all ages are associated with heart disease, and the number of AIs aged 45 years and older dying of heart disease exceeds the number of those succumbing to the next three leading causes of death—cancer, diabetes, and unintentional injuries—combined (National Heart, Lung, and Blood Institute [NHLBI], 2001). Incidence rates are also rising in fatal coronary heart disease in AIs as compared to the declining rates in the U.S. population overall (Howard et al., 1999). The AIAN rate for heart disease is 20% higher than the U.S. all-races rate (Indian Health Service [IHS], 2003), with the incidence of CVD at 15-28 per 1,000 AI men ages 45-74 and 15 per 1,000 AI women in the same age range (NHLBI).

According to Census 2000, in Arizona alone, AIAN consisted of 5% of the total population of 255,879 (U.S. Census Bureau, 2003). Within the borders of Arizona, there are 21 federally recognized tribes (see Fig. 1), and their reservations and tribal communities constitute over 25% of the state of Arizona (The University of Arizona Rural Health Office, 2006). Based
FIGURE 1. A Thematic Map of American Indian Reservations in Arizona. (Reproduced from “American Indian Reservations,” by the Arizona Department of Transportation Multimodal Planning Division, 2008, ADOT Map Book, p. 30.)
on this information, it evident that AIs can constitute a significant portion of the patient population seen in rural emergency departments, hospitals, and clinics in Arizona.

It is important for advanced practice nurses practicing in the Southwestern United States to be familiar with current health issues of the AI population. The leading causes of death in the general U.S. population are diseases of the heart (Kung, Hoyert, Xu, & Murphy, 2008). Prior to the Strong Heart Study, it was thought that the AIs had lower rates of CVD mortality than the general U.S. population. The Strong Heart Study authors initiated a study of CVD among AIs in 13 communities in Arizona, Oklahoma, North Dakota, and South Dakota. The study results revealed that CVD incidence rates were increasing and more often fatal in AIs than in the general U.S. population (Lee et al., 1998).

**Purpose**

The purpose of this master’s report is to present a theoretical framework and review of literature in preparation for a planned Practice Inquiry study to examine: 1) presenting symptoms of ACS and factors determining the decision to seek treatment, 2) factors associated with pre-hospital delay, and 3) knowledge of ACS in the AI population. Examining presenting symptoms of ACS, factors determining the patient’s decision to seek treatment, reasons for the delay in seeking treatment, and knowledge of symptoms will provide a basis for planning a study of AI perception of ACS symptoms and CVD. Health care providers can then use the results of the study to develop culturally sensitive, community-based educational programs for ACS awareness and CVD risk reduction in the AI population.
Background

“Cardiovascular disease” is a general term that encompasses a range of diseases that impact the heart and circulatory system. The diseases that fall under the category of CVD include coronary heart disease, arteriosclerosis, heart failure, valvular heart disease, diseases of the aorta and its branches, disorders of the peripheral vascular system, arrhythmias, hypertension, and congenital heart defects (World Health Organization [WHO], 2009). In 2006, the death rate for coronary heart disease was 122.4 per 100,000 for AIAN men and 76.4 per 100,000 for AIAN women (Heron et al., 2009). The overall death rate for coronary heart disease in the general U.S. population in 2006 was 134.9 per 100,000 (National Center for Health Statistics [NCHS], 2009). The risk for coronary heart disease in the AIAN population is due to the prevalence of many of the risk factors—hypertension, hyperlipidemia, diabetes, tobacco use, obesity, physical inactivity, poor health—for heart disease (Galloway, 2002). Unstable angina, non-ST-elevation myocardial infarction, and ST-elevation myocardial infarction are all complications encountered with coronary heart disease (Anderson et al., 2007). These conditions are the focus of this master’s report.

Acute Coronary Syndrome

ACS describes acute myocardial ischemia as it pertains to unstable angina, myocardial infarction without ST-elevation, and myocardial infarction with ST-elevation (Anderson et al., 2007). Myocardial infarction from prolonged ischemia occurs due to a perfusion imbalance of blood to the myocardium and results in myocardial cell death (Thygesen, Alpert, & White, 2007). Myocardial ischemia is identified from patient history and from an electrocardiogram (Thygesen et al.). Reported symptoms of myocardial ischemia include pain or discomfort of the
chest, upper extremity, jaw, or epigastric region and can occur with exertion or at rest (Thygesen et al.). The pain is most often described as diffuse, not dependent on movement, and may be accompanied by dyspnea, diaphoresis, nausea, or syncope (Thygesen et al.). Little is known about AI responses and behaviors to the symptoms of ACS.

**Unstable Angina/Non-ST-Elevation Myocardial Infarction**

Unstable angina/non-ST-elevation myocardial infarction is a subset of ACS that is usually caused by atherosclerotic coronary artery disease and that carries an increased risk of cardiac death (Anderson et al., 2007). In unstable angina/non-ST-elevation myocardial infarction, there is decreased myocardial perfusion due to a narrowing of the coronary artery caused by a non-occlusive thrombus that developed from a disrupted atherosclerotic plaque (Anderson et al., 2007). Unstable angina/non-ST-elevation myocardial infarction is identified on electrocardiogram by an ST-segment depression or prominent T-wave inversion and/or positive serum biomarkers (troponin and CK-MB) for cardiac damage in the absence of ST-segment elevation (Anderson et al., 2007). Patients with the chief complaints of chest pain or severe epigastric pain (nontraumatic in origin), dyspnea, nausea and/or vomiting, and diaphoresis must get a stat electrocardiogram, ideally within 10 minutes of arrival (Anderson et al., 2007). These patients are not candidates for thrombolytic reperfusion therapy and should receive anti-ischemic therapy or catheter-based therapy (Anderson et al., 2007).

**ST-Elevation Myocardial Infarction**

Patients with ST-elevation myocardial infarction have a greater incidence of a coronary artery thrombus occluding a coronary artery than patients presenting with unstable angina/non-ST-elevation myocardial infarction. ST-elevation myocardial infarction patients are candidates
for reperfusion therapy with fibrinolytics or primary percutaneous coronary intervention to
restore coronary blood flow to the infarcted artery (Antman et al., 2004). Patients with symptoms
of ST-elevation myocardial infarction should get an electrocardiogram within 10 minutes of
arrival at a hospital (Antman et al., 2004). ST-elevation myocardial infarction is identified on
electrocardiogram by an ST-segment elevation of 1 mm or greater in two contiguous precordial
leads (Antman et al., 2004). According to the American College of Cardiology/American Heart
Association (ACC/AHA) guidelines, the goal for these patients is a door to needle time within 30
minutes or door to balloon time within 90 minutes, with the total ischemic time being within 120
minutes (as cited in Antman et al., 2004). In the absence of contraindications, fibrinolytic therapy
should be given to ST-elevation myocardial infarction patients with onset of symptoms within
the prior 12 hours, ST-elevation greater than 1mm in two contiguous precordial leads, and new
or presumably new left bundle branch block (Antman et al., 2004). Early evaluation is critically
important in identifying individuals who may be having an ST-elevation myocardial infarction so
they can be considered for immediate reperfusion therapy, whether it is through a fibrinolytic or
primary percutaneous coronary intervention (Antman et al., 2004).

**Availability of Services on the Navajo Reservation**

There are 21 federally recognized tribes, whose reservations and tribal communities
constitute over 25% of the geographic area of Arizona (The University of Arizona Rural Health
Office, 2006). This report provides background for a planned study that will focus primarily on
the AIANs living within Arizona borders, on or near the Navajo reservation. The Navajo
reservation is the largest AI reservation in the southwestern United States. The Navajo
reservation covers about 27,000 square miles and occupies all of northeastern Arizona, the
southeastern portion of Utah, and northwestern New Mexico (U.S. Census Bureau, 2003) and is approximately the size of West Virginia (IHS, 2008a). The 2000 U.S. Census reported 298,215 Navajo people living throughout the United States, of which 173,987 (58.34%) were within the Navajo Nation boundaries, and of these, 131,166 live in Arizona (U.S. Census Bureau, 2003). The Navajo Area Indian Health Service (NAIHS) provides medical and public health services to over 200,000 AIs on or near reservations at 6 hospitals, 6 health centers and 15 health stations in parts of Arizona, New Mexico, and Utah (see Figure 2; IHS, 2008a). Health centers are open 40 or more hours per week with primary care providers on staff and have comprehensive ancillary services (IHS, 2008a). Health stations are open less than 40 hours per week and have limited ancillary services (IHS, 2008a).

According to a report from the United States Government Accountability Office (USGAO, 2005), Native Americans’ access to health care services in IHS facilities were not always assured. Factors identified that affected access to services were wait times, travel distances to facilities, lack of transportation (USGAO, 2005), and accessibility to emergency medical services. Although the Navajo reservation has an established emergency medical service in place, it does not have a formal 9-1-1 system. The Navajo Police Department has been responsible for ambulance services since 1965 and, if an ambulance is needed, the patient places a call the local police department, who then dispatches an ambulance to the scene or place of residence (Navajo Nation Emergency Medical Service, 2008). The majority of the Navajo live in rural areas not easily accessible to emergency medical services. Another problem encountered in these rural areas is the lack of actual addresses to places of residence. Inadequately paved roads,
lack of electricity, telecommunication, police, emergency medical services, and fire protection services are factors that could contribute to delay of care.

Health care services on the reservations are limited, and most, if not all facilities do not have the capability to perform cardiac catheterization, coronary angiograms, or stent placement. For individuals having an ST-elevation myocardial infarction, in which fibrinolytic therapy is not an option, the prompt facilitation of an emergency inter-hospital transfer of the patient to a
percutaneous coronary intervention-capable hospital for mechanical revascularization is of utmost importance (Antman et al., 2004). An example of the distance between a hospital on the Navajo reservation and a percutaneous coronary intervention-capable facility is Tuba City Regional Health Care Corporation, a 73-bed hospital that services the western portion of the Navajo and Hopi reservations, which is 75 miles away from Flagstaff Medical Center, a percutaneous coronary intervention-capable facility.

**Transportation/Transfer Issues**

For AIANs living in rural areas on the reservations, the most important task is to get to an emergency department as soon as possible once they recognize chest pain symptoms suggesting an acute myocardial infarction. Total ischemic time should be within 120 minutes from symptom onset (Antman et al., 2004). If conditions were ideal and the patient presented to the emergency department within 12 hours of symptom onset, then emergency department staff could initiate fibrinolytic therapy (if no contraindications were present; Antman et al., 2004). This alone would result in a 20% decrease in mortality in anterior myocardial infarction or left bundle branch block or a 10% decrease in mortality in an inferior myocardial infarction (Morrison, Verbeek, McDonald, Sawadsky, & Cook, 2000).

According to anecdotal information from IHS hospital staff (personal communication, March 12, 2010), the burden lies with the patient’s family to come up with the finances and transportation to travel long distances to be with their loved one after he/she has been transferred off the reservation to urban areas for percutaneous coronary intervention. Often, the responsibility of back transport to the reservation is solely the responsibility of the patient’s family. These are reasons why it is so important that AIANs with symptoms of ST-elevation
myocardial infarction recognize the need to seek care, so fibrinolytic therapy (if not contraindicated) can be initiated, thus avoiding the need to transport off the reservation for percutaneous coronary intervention, thus reducing costs and alleviating financial burden and hardship for the patient and family.

Other problems anecdotally reported by IHS hospital staff (personal communication, March 12, 2010) about transportation/transfers of AIAN patients to outlying percutaneous coronary intervention-capable facilities are weather conditions and availability of transport (ambulance, medical helicopter, fixed-wing transport). Extreme weather conditions such as wind, dust storms, snow, and rain sometimes make it difficult for air transports to take place. There is also lack of availability of air transport to transport patients to percutaneous coronary intervention-capable facilities or ambulances to transport patients to the helipad/airport.

**Significance to Nursing**

Seeking emergent care for symptoms of ACS is an important part of treating ACS. The critical aspect in the management of unstable angina/non-ST-elevation myocardial infarction and ST-elevation myocardial infarction is prompt initiation of ACS treatment protocols. The timely initiation of these protocols is dependent on the time the patient presents to the EMS or to the health care facility. Prompt presentation and treatment for ACS would reduce diagnoses or treatment delays that result in exacerbated severity of a patient’s condition and also reduce the need for more intensive treatment. Identifying and understanding cultural barriers of AIANs seeking emergent care for ACS symptoms would allow health care providers to better anticipate the needs of this population and enable provision of culturally appropriate and timely interventions.
Because the focus of advanced practice nurses is on health assessment, health maintenance, disease prevention, counseling, and patient education, they are in an excellent position to create culturally sensitive, community-based programs to raise awareness of ACS symptoms and CVS in the AIAN population among their colleagues and their patients. They can also provide education on the importance of seeking emergent treatment for those symptoms and promote CVS risk reduction in the AIAN population by recognizing presenting symptoms of ACS and factors determining the decision to seek treatment, being familiar with factors associated with pre-hospital delay, and assessing of the extent of knowledge of ACS and CVS among the AI population.

Evaluation of current CVD and ACS awareness health promotion and prevention programs is needed. Are current health promotion and prevention programs successful in the AI population? If so, what factors contributed to their success? It is important knowing how AIs learn and what motivates them to learn. Knowledge of current programs would be beneficial to advanced practice nurses who are thinking of starting a program in their community and would improve the likelihood of success.

Specific Aims

Specific aims of this report are to describe: 1) the conceptual basis for a planned study to examine presenting symptoms of ACS, factors determining the decision to seek treatment, factors associated with pre-hospital delay, and extent of knowledge of ACS among the AI population; 2) results of a focused literature review of CVD in the AI, time to seeking care for ACS, barriers to care, health promotion, and increasing awareness of CVD and ACS in the AI
population; and 3) gaps in knowledge from the research literature; and 4) recommendations for future research to support a planned Practice Inquiry study.

**Definition of Terms**

- **American Indian (AI):** members of Indian tribal nations living in the United States (IHS, n.d.).
- **Alaska Native (AN):** the Eskimo and Aleut populations, the indigenous people of Alaska (IHS, n.d.).
- **Native American:** American Indians, Eskimos, Aleuts, Native Hawaiian as one racial and ethnic group (IHS, n.d.). “A member of any aboriginal peoples of the western hemisphere; especially: a Native American of North America and especially the United States” (Merriam-Webster OnLine, 2010).
- **Cardiovascular Disease (CVD):** diseases of the circulatory system. This category includes coronary heart disease, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, and deep vein thrombosis and pulmonary embolism (WHO, 2009).
- **Coronary heart disease:** a category that includes “acute myocardial infarction; other acute ischemic (coronary) heart disease; angina pectoris; atherosclerotic cardiovascular disease; and all other forms of chronic ischemic heart disease” (American Heart Association [AHA], 2010b, p. 34).
- **Acute Coronary Syndrome (ACS):** any group of clinical symptoms that indicate acute myocardial ischemia including myocardial infarction—ST-segment elevation and depression, Q wave and non-Q wave—and unstable angina (Anderson et al., 2007).
• **Unstable Angina/Non-ST-Elevation Myocardial Infarction:** two similar syndromes characterized by an imbalance between myocardial oxygen supply and demand that develops most often because of decreased myocardial perfusion due to coronary narrowing caused by nonocclusive thrombus formations following a disruption of an atherosclerotic plaque. Myocardial injury without acute elevation of ST-segment or presence of Q waves; but changes such as ST-depression, T wave inversion, or both may be present. (Anderson et al., 2007).

**Summary**

With heart disease incidence and death rates for the AIAN population at a higher rate than those of the total U.S. population, health care providers need to address this significant health issue in the AIAN population (Howard et al., 1999). The AIAN population has many of the risk factors associated with increased risk for heart disease, such as hypertension, hyperlipidemia, diabetes, tobacco use, obesity, physical inactivity, and poor health (Galloway, 2002). Decreasing heart disease incidence and death rates in the AI population can begin through an understanding of the presenting symptoms of ACS, factors prompting the decision to seek treatment, factors associated with pre-hospital delay, and extent of knowledge on ACS in this population.

The treatment of unstable angina/non-ST-elevation myocardial infarction and ST-elevation myocardial infarction is prompt reperfusion therapy either through thrombolytic therapy or percutaneous coronary intervention. Factors that negatively affect prompt treatment times of ACS, such as availability of services on reservations and problems with transportation to health care facilities or transfers to a percutaneous coronary intervention-capable facility need
to be identified. Early presentation of the AI patient to the emergency department for symptoms of ACS can: 1) decrease mortality, 2) reduce the need for transport off the reservation for reperfusion therapy, and 3) improve cardiac outcomes (Antman et al., 2004; Morrison, Verbeek, McDonald, Sawadsky, & Cook, 2000). Prompt presentation and treatment for ACS would reduce diagnoses or treatment delays that result in exacerbated severity of a patient’s condition and also reduce the need for more intensive treatment.

The planned Practice Inquiry study will be based on the theoretical framework and review of literature described in this master’s report. The findings of the planned Practice Inquiry study may assist rural health care providers and advanced practice nurses whose patient population consists of AIs. The advanced practice nurse, with their scope of practice and advanced level of knowledge of health assessment, health maintenance, disease prevention, counseling, and health promotion can lead the way to create culturally appropriate programs to promote CVD risk reduction and educate others on ACS symptoms in the AI population.
CHAPTER TWO: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

Chapter two is a description of the theoretical framework, Leventhal’s Common Sense Model (CSM) of Illness Representation, and focused review of the research literature on: CVD in the AIAN population, time to seeking care for ACS, barriers to care, knowledge of ACS, and health promotion of CVD and ACS in the AIAN population. This chapter also identifies gaps in knowledge, concluding with recommendations for future research. Leventhal’s CSM is the organizing framework for the planned Practice Inquiry study to examine: 1) presenting symptoms of ACS and factors determining the decision to seek treatment, 2) factors associated with pre-hospital delay, and 3) knowledge of ACS in the AI population.

Theoretical Framework: Leventhal’s Common Sense Model of Illness Representation

Leventhal’s research began in the late 1960s and early 1970s and consisted of studying how high fear messages, rather than low fear messages, are more effective in changing attitudes towards a recommended health action (Leventhal, 1970). In one of his earliest studies, Leventhal discovered that the representation of the health threat along with an action plan was influential in the initiation of subsequent coping actions (Leventhal, 1970). Illness representation is defined as patient beliefs and expectations about an illness or somatic symptom (Leventhal, 1970). The CSM provides representation of the health threat and subsequent action plan.

The CSM of illness representation conceptualizes individuals as problem solvers dealing with their perceived reality (cognitive) of the health threat and their emotional reactions to this threat (see Fig.3; Leventhal, 1970). Leventhal developed a model of an adaptive system consisting of three main constructs: 1) the illness representation experience that potentially guides 2) coping procedures, followed by 3) appraisal or monitoring of the success or failure of
the coping procedures.

**FIGURE 3.** A Schematic Representation of Leventhal’s CSM of Illness Representation. (The CSM has a parallel processing system that has two parts: 1) a cognitive arm which deals with the perceived reality of the health threat, and 2) an emotional arm which is the emotional reaction to this threat. Reproduced from “The Common Sense Model of Illness Representation: Theoretical and Practical Considerations,” by M. A. Diefenbach and H. Leventhal, 1996, *Journal of Social Distress and the Homeless*, 5, p. 21.)

The five components of illness representation are identity, timeline, causal, consequences, and curability/controllability (Diefenbach & Leventhal, 1996). Identity is the label given to the condition and the symptoms such as location, extent and feel that go with the condition. Timeline is the predictive belief about how long the symptoms might last or how the symptoms are connected to an expected timeline of acute, chronic, or cyclic and helps the individual determine how serious or non-serious the stimulus/symptom is and will ultimately
affect their response. The causal aspect of illness representation gives further meaning to the stimulus or symptoms and can be hereditary, external, or internal. A consequence is the term indicating the believed outcome and anticipated repercussions (in terms of personal experiences, economic hardship, or emotional upheaval) of a stimulus or symptom. The last component of illness representation is curability or controllability, which describes the responsiveness of the stimulus or symptom to self and/or professional intervention, whether it can be managed or resolved, and the degree to which the individual plays a part in achieving this (Diefenbach & Leventhal, 1996).

There are three central principles to the CSM of illness representation (Diefenbach & Leventhal, 1996):

1. The individual is an active problem solver that seeks information and acts to test hypotheses about the significance of symptoms and physical condition. The interpretation of symptoms and physical condition is influenced by media and information received from others (family, friends, acquaintances, health care provider) about health risks.

2. The key cognitive concept that guides coping and the evaluation of action outcomes is illness representation.

3. Illness representations are individualized and may not follow medical facts or conditions.

The main concept within the CSM is illness representations, in other words, the individual’s beliefs about his/her illness symptoms. Personal beliefs about illness symptoms combined with personal knowledge of existing normative guidelines enable individuals to make sense of their symptoms and thus guide any coping action. At either the cognitive and emotional level, internal and external stimuli (or symptoms) evoke illness representations and individuals
interpret these stimuli (or symptoms) through prior health and illness experiences. At the cognitive level, individuals have perceptual (cognitive) representations of health threats, stimuli, or symptoms and develop plans to evaluate and act on those threats, stimuli, or symptoms. At the emotional level, there is a parallel set of emotional reactions and procedures that these individuals use for managing emotions (Diefenbach & Leventhal, 1996). Information from the cognitive and emotional level is processed by an individual’s personal health history, their personality dispositions or traits, and in an interpersonal and cultural context.

Leventhal’s CSM of illness representation will be the framework for a Practice Inquiry study that is planned to describe illness representation in the AI population. The CSM of illness representation offers a theoretical framework for describing presenting symptoms of ACS in the AI population, factors determining the decision to seek treatment, factors associated with pre-hospital delay, and AI knowledge of symptoms of ACS. Promptly seeking treatment for symptoms of ACS is crucial in the management of unstable angina/non-ST-elevation myocardial infarction and ST-elevation myocardial infarction. ACS treatment protocols must be initiated without delay in order to minimize myocardial cell damage and improve cardiac outcomes. Treatment seeking behaviors for ACS can be better understood through further study of AI characteristics in the five components (identity, timeline, causal, consequences, curability/controllability) of Leventhal’s CSM. Knowing how AIs label symptoms of ACS, how they connect the symptoms to an expected timeframe, their perceptions of the cause of the symptoms, their perceived consequences or anticipated repercussion of the symptoms, and their perceived controllability and responsiveness of the symptoms to self and/or professional intervention will guide the planned Practice Inquiry study.
The results of the planned Practice Inquiry study can be a resource for advanced practice nurses for development of a culturally-sensitive, community-based education program directed toward the AI population to improve knowledge of CVD and ACS symptoms. Teaching AIs the symptoms and labels associated with heart disease will enable them to correctly identify ACS symptoms and seek treatment sooner. The CSM of illness representation will guide the exploration of AIs as problem solvers dealing with their perceived reality (cognitive) of the symptoms of ACS and CVD and their emotional reactions to this threat.

**Literature Review**

The review of literature is from literature searches conducted December, 2009 through March, 2010, utilizing CINAHL, Medline, OVID, PubMed, Arizona Health Science Library librarian, Google, and Google Scholar. Individual searches were also performed using references cited in selected research articles. The review covers literature on CVD, ACS, AIAN heart disease, and programs reported in the literature. The key words used to guide the searches were American Indian, Native American, heart disease, cardiovascular disease, risk factors, acute coronary syndrome, coronary heart disease, treatment delay, barriers to care, health promotion, myocardial infarction, and Strong Heart Study. The searches identified 32 research articles on the topics, which the review of literature describes. The years covered in the data base searches were 1995 through 2010.

**Cardiovascular Disease and the AIAN**

Prior to the 1980s, prevalence data from initial studies suggested that AIs had lower rates of myocardial infarction and coronary heart disease than other U.S. groups (Sievers & Fisher, 1981). Due to the inadequacy of information on CVD in the AI population (Lee et al., 1990), the
Strong Heart Study was designed in 1988 to investigate CVD and its risk factors in AIs. The study population consisted of AIs in 13 communities throughout Arizona, Oklahoma, South Dakota, and North Dakota. The results of the Strong Heart Study revealed that AIs were not at lower risk of developing CVD as compared to the non-AI population. Howard et al. (1999) revealed findings that rates of coronary disease in AIs may exceed those in other U.S. populations and coronary events were more likely to result in death, especially in Arizona AI communities. Modifiable risk factors for CVD include tobacco use, high cholesterol, high blood pressure, physical inactivity, obesity and overweight, and diabetes mellitus. These risk factors were significant independent predictors of CVD in the AI men and women in this study (Howard et al., 1999). More specifically, significant independent predictors of CVD in women were diabetes, age, obesity, LDL cholesterol, albuminuria, triglycerides, and hypertension; and in men, diabetes, age, LDL cholesterol, albuminuria, and hypertension (Howard et al., 1999). Unlike other ethnic groups, AIs seem to have an increasing incidence of coronary heart disease, possibly due to the high prevalence of CVD risk factors in the AI population (Howard et al., 1999).

As noted earlier, the Navajo Nation is the largest AI tribe in the United States, with a reported population of 298,215 Navajo people living throughout the United States, of which 173,987 (58.34%) were within the Navajo Nation boundaries (U.S. Census Bureau, 2003). Because the application of the results of this review of literature will be mostly with AIs living within Arizona borders, on or near the Navajo reservation, it is important to review literature pertaining to the Navajo people. The literature search utilizing CINAHL, Medline, OVID, PubMed, the Arizona Health Science Library librarian, Google, and Google Scholar revealed
little current published research on CVD and ACS in the Navajo population or even the AI population in general. Mendlein et al. (1997) conducted a population-based examination of coronary heart disease risk factors in Navajo men and women between the ages of 20 and 91. They found that Navajo adults had undesirable levels of several coronary heart disease risk factors, such as obesity, physical inactivity, diabetes, HDL cholesterol and triglycerides (Mendlein et al., 1997). The presence of many coronary heart disease risk factors in the Navajo indicates that the incidence and mortality of coronary heart disease in this population is likely to increase (Mendlein et al., 1997). Heart disease is the second leading cause of death among the Navajo due to the prevalence of these CVD risk factors (IHS, 2003). The findings of Mendlein et al. (1997) provide baseline data to health care providers to assess the effects of coronary heart disease risk factors in the Navajo and can inform development of culturally appropriate prevention strategies in this population (Mendlein et al., 1997).

The National Cholesterol Education Program’s Adult Treatment Panel III report (National Cholesterol Education Program [NCEP], 2002) identified underlying risk factors for CVD: abdominal obesity, physical inactivity, and a high fat diet. The major CVD risk factors are cigarette smoking, hypertension, elevated LDL, low HDL, family history of premature CHD, and aging (NCEP, 2002). The report also identified emerging CVD risk factors as elevated triglycerides, small LDL particles, insulin resistance, glucose intolerance, elevated inflammatory cytokines, and elevated fibrinogen levels, which are also designated as metabolic risk factors (NCEP, 2002). Metabolic syndrome is characterized any combination of the three following factors: hypertension, abdominal or central obesity, higher than normal triglycerides, lower than normal HDL levels, and higher than normal fasting blood glucose (NCEP, 2002). The prevalence
rate of metabolic syndrome in AIs ages 45 to 49 is significant, 43.6% compared to 20% of the in the U.S. general population within this age range (Resnick, 2002). AIs have higher rates of diabetes compared to the general U.S. population, so diabetes and features of metabolic syndrome have been related to a higher risk of CVD in AIs (Lee et al., 1995). Because of the higher risk of CVD associated with metabolic syndrome in AIs, it is important that this syndrome is recognized and programs of primary prevention are initiated that target the similar risk factors of these two closely related disease processes (NCEP, 2002).

An important group in the AI population is older AIs. Rhoades et al. (2007) studied longitudinal changes in the prevalence of major CVD risk factors in aging AIs. The study participants were AIs aged 45 to 74 who were members of three tribes from central Arizona, seven tribes from southwestern Oklahoma, and three tribes from North Dakota and South Dakota (Rhoades et al., 2007). Even though death from CVD is decreasing in the general U.S. population, it is increasing in the AI population and is likely to exceed those in the general population (Howard et al., 1999; IHS, 2003). In the Rhoades et al. study there were significant increases in hypertension and diabetes mellitus, two of the most important CVD risk factors, and a significant presence of low HDL-C among this population (Rhoades et al., 2007). These researchers found that, even though there was a decreased prevalence of smoking, continued adverse increases in hypertension, low HDL-C, and diabetes mellitus are still present in the aging AI and will likely result in increases in CVD mortality and morbidity (Rhoades et al., 2007). The authors concluded that in order to stabilize and reduce rates of chronic disease in AI communities, culturally sensitive, community-based interventions, along with committed tribal leadership and aggressive clinical programs, are needed (Rhoades et al., 2007).
Racial Misclassification

Rhoades (2005) discussed discrepancies in national vital event data prior to the 1980s that were suggesting CVD mortality for AIAN were lower than in the general U.S. population despite the fact that AIAN had some of the highest prevalence rates of major CVD risk factors, such as tobacco use, high cholesterol, high blood pressure, physical inactivity, obesity and overweight, and diabetes mellitus (Rhoades, 2005). The author utilized data from the IHS to report trends in CVD mortality and also to assess the influence of racial misclassification on the previously unknown CVD disparity in the AIAN (Rhoades, 2005). Racial misclassification may occur when AIAN cases are reported in a different racial/ethnic category, thus causing an underestimation of the true burden of disease (Rhoades, 2005). Without adjustment for misclassification, there was a significant (but favorable) gap in major CVD mortality rates for AIAN compared with other groups. The IHS began to adjust for racial misclassification beginning with data from the early 1990s.

When Rhoades (2005) applied the racial misclassification adjustment to previously compiled national vital event data, she found that there was a 16% increase in major CVD mortality rates, an 18% increase in rates for diseases of the heart, and mortality rates at the highest in the AIAN. Rhoades states these “findings suggest that total CVD mortality for AIAN is higher, not lower, than in the rest of the nation and may have been higher for more than a decade” (Rhoades, 2005, p. 1253). Rosenberg et al. (1999) found that the underestimation of death rates was around 21%, compared with 11% for Asians and 2% for Hispanics. Results of these data analyses revealed that racial misclassification in the AIAN population had led to a
significant underestimation of other diseases, such as cancer mortality, injury rates, and prevalence of end-stage renal disease (Rosenberg et al., 1999).

**Time to Seeking Care for ACS**

Moser and colleagues (Moser et al., 2006) reported that delay in seeking treatment was the major factor limiting delivery of definitive treatment in ACS and stroke symptoms. Moser et al. (2006) submitted a scientific statement in which they summarized the evidence that showed the benefits of early treatment, described the scope of the problem of patient delay, identified the factors related to patient delay in seeking timely treatment, and discussed inadequacies in the current approaches to decreasing patient delay. The American Heart Association (AHA) has statistics revealing that of the 1.5 million people in the United States suffering from an acute myocardial infarction or coronary death each year, 50% died in the emergency department or before reaching a hospital within an hour of onset of symptoms (AHA, 2005). The benefits of early treatment for ACS is the reduction of morbidity and mortality, with survival rates improving by 50% if reperfusion is within one hour of the onset of symptoms and by 23% if it is within three hours of onset of symptoms (Simoons et al., 1986). In another study of 565 patients undergoing direct coronary angioplasty for AMI, the 30-day mortality rate was 1% for patients who received the first balloon inflation within 60 minutes of arrival at the hospital (Berger et al., 1999). For every 15 minute delay after the first hour, there was a 1.6 times greater risk of death (Berger et al.). Early treatment with reperfusion, angiotension-converting enzyme inhibitors, beta-blockers, and aspirin can reduce morbidity and mortality (Moser et al., 2006).

Early presentation of the AI patient to the emergency department for symptoms of ACS can: 1) decrease mortality, 2) reduce the need for transport off the reservation for reperfusion
therapy, and 3) improve cardiac outcomes. Prompt presentation and treatment for ACS would reduce diagnoses or treatment delays that result in exacerbated severity of a patient’s condition and also reduce the need for more intensive treatment.

Sociodemographic factors that contribute to delay in seeking care are old age, female, low education, low socioeconomic status, African American, and Native American (Moser et al., 2006). Cultural differences in symptom response were likely influenced by trust in physicians and medical facilities, perceived access to necessary services, perceived discrimination, satisfaction with previous medical care, and effectiveness of patient-provider communication (Moser et al., 2006). Social, cognitive, and emotional factors contributing to delay in seeking care for ACS symptoms include social commitments, being at home when symptoms begin, activity level at time of symptom onset, living alone, feeling embarrassed, prior experience of false alarms, mismatch of symptom expectations, the individual’s knowledge of treatment options, and self-treatment with prescription medication (nitrates included; Moser et al., 2006).

Being aware of the social, cognitive, and emotional factors that contribute to delay will enable health care providers to develop culturally sensitive interventions. Providers need to know how and why individuals come to interpret their symptoms of ACS, how they develop coping strategies, and how and why they finally decide to act. The Rapid Early Action for Coronary Treatment trial was a 4-year, multisite community intervention study designed to test whether a community-based, multicomponent intervention of 18 months duration would reduce patient delay in seeking treatment for ACS symptoms (Luepker et al., 2000). The study participants included individuals from various ethnic backgrounds (Luepker et al., 2000). The intervention included the following: 1) educating medical and nonmedical community leaders, 2) promoting
awareness of ACS symptoms through community education programs, 3) educating healthcare providers and encouraging them to educate the community, and 4) patient education for high-risk patients and family (Luepker et al., 2000). Despite the 18-month intervention, no reduction in delay to seeking treatment for ACS symptoms was observed in the study participants (Luepker et al., 2000). Based on this finding, providers must develop new ways to educate the public on ACS symptom recognition, especially in the AI population.

Struthers, Savik, and Hodge (2004) studied CVD and response behaviors to chest pain in 866 AI women, aged 22 years and older, who were participants in the Inter-Tribal Heart Project. Selected variables included demographic characteristics, health care access, rating of health status, and personal and family history of CVD, and action in response to crushing chest pain lasting longer than 15 minutes. Participants answered questions on several areas related to CVD on three rural reservations in Minnesota and Wisconsin (Struthers et al., 2004). Prior to this study, not much had been known about CVD responses and behaviors in AI women. This study brought to light how CVD and chest pain response behaviors are represented in a certain population of AI women.

Even though the Struthers et al. (2004) study represented AI women from three reservations in Minnesota and Wisconsin, the results can be useful when studying AI men and women from other U.S. tribes. Comparing results of the planned Project Inquiry with results of the Struthers et al. (2004) study may reveal similarities or differences (demographic characteristics, health care access, health status rating, personal and family history of heart disease and stroke, and chest pain symptoms) among AI tribes. The demographic characteristics of the Struthers et al. (2004) study sample showed a mean age of 46.8, 33% with high school
education, 28.5% with less than high school education, 56% employed, and 45% with an annual household income of less than $15,000. A majority of the women received medical attention from an IHS facility and 93% of the research participants lived less than 30 miles from where they received health care (Struthers et al., 2004). Some participants reported that they could not get health care due to long wait times, transportation problems, childcare issues, long travel times, the inability to pay (those that did not use an IHS facility), and not being able to take time off work (Struthers et al., 2004). Approximately one-third (32%) of AI women in this study stated they would not seek treatment unless they experienced crushing chest pain greater than 15 minutes. Some would sit down and wait until the chest pain subsided and seek treatment when convenient (Struthers et al., 2004). These women were younger and had less education than the women who took an active response to crushing chest pain (Struthers et al., 2004).

Leventhal’s CSM of illness representation model was used to study participants’ expectations of what a heart attack might feel like, symptom presentation and time to seek care (King & McGuire, 2007). The participants in this study were 30 men and 30 women between ages 35-87, and included Whites, African-Americans, and one Hispanic. According to the authors, when an individual’s experience of what they thought an acute myocardial infarction would feel like does not match their actual acute myocardial experience, it may take longer for them to recognize that the symptoms are cardiac-related. These individuals usually wait longer to seek care compared with individuals whose expectations match their actual experience of how they thought an acute myocardial infarction may feel (King & McGuire, 2007). Symptoms commonly reported by both men and women in this study were discomfort, pain, tightness, pressure, dull ache, heaviness, weakness, fatigue, diaphoresis, shortness of breath, fear, and
nausea (King & McGuire, 2007). Significant findings in this study were that women were more likely to report right shoulder discomfort and less likely to report mid-chest discomfort than men (King & McGuire, 2007). The more the expected acute myocardial infarction symptoms matched the actual symptoms, the greater the likelihood of presentation to the emergency department within one hour (King & McGuire, 2007). The common action taken in response to symptoms was to call a family member or friend (King & McGuire, 2007). There were no gender differences in time to seek care after onset of symptoms and reporting of mismatch between expected and actual symptoms (King & McGuire, 2007). Although the study participants did not represent the total AI population, the design of this study can be a resource on methods to use in studying symptom presentation, time to seek care, and experience expectations of acute myocardial infarction in the AI population.

Identifying variables that have an effect on the decision to seek care can be useful in reducing time to treatment of ACS. In 256 patients of various ethnic backgrounds admitted to the hospital with ACS, DeVon, Hogan, Ochs, and Shapiro (2010) set out to explore the factors related to the decision to seek care for ACS symptoms and the attributes related to time to presentation. Their goals were to describe how patients verbalized their symptoms, explore reasons for seeking care, distinguish categories of decision making, and describe factors related with time to presentation to the emergency department (DeVon et al., 2010). They found that most patients verbalized their symptoms using language similar to their health care provider’s language, especially with the words “chest pain” and “shortness of breath”. The commonly cited reasons for deciding to seek care in the emergency department included new onset of chest pain, continued assessment of severity of symptoms (such as pain worsening after eating or continued
pain despite interventions), worsening or unrelieved symptoms other than chest pain (worsening shortness of breath, diaphoresis, increasing pain), externally motivated factors (calling physician, calling family member/friend) and internally motivated factors (individuals independently deciding to seek medical attention; DeVon et al., 2010). Time to presentation to the emergency department was six hours or more after onset of symptoms in both the men and women in this study (DeVon et al., 2010). A factor associated with an earlier time to seek treatment was constant pain. A factor associated with a longer time to seek treatment was older age (DeVon et al., 2010). DeVon et al. found that only 20.3% of patients presented to the emergency department in two hours or less, 52% delayed seeking treatment 6 or more hours, and women waited 3.5 hours longer than men before presenting to the emergency department. These findings can help health care providers address variables that influence the decision to seek care and explore decision making behaviors in the AI population.

**Barriers to Care**

Barriers to care are numerous in the AI population. Some barriers that AIs encounter are financial, access, cultural, family/work responsibilities, confidence/trust in health care providers, and discrimination (Call et al., 2006). A study conducted with AIs and White enrollees in Minnesota’s public health care programs revealed that barriers to health care access were reported by both AIs and Whites (Call et al., 2006). AI adults reported more transportation difficulties, issues with work/family responsibilities, cultural and religious differences, and racial/ethnic discrimination as compared to the White participants (Call et al., 2006). AI participants reported issues with limited clinic hours, physicians not understanding their culture and religion, lack of trust of physicians, and racial/ethnic discrimination (Call et al., 2006).
White participants in the Call et al. (2006) study were more apt to report problems with seeing their preferred provider. The study did not identify where the AI study participants went for their health care needs, for example, urban health care centers, rural health care clinics (non-IHS) or IHS health care facilities. There were no results on barriers encountered by the AI population depending on type of health care facility. The important finding of the Call et al. (2006) study is that the significant differences in barriers reported between the AI and White population deal with issues of trust, respect, and discrimination. More research is needed to determine if these issues result in the AI delaying or going without care.

Being non-English speaking or having English as a second language can also present as a barrier to care for AI patients. King, Khan, and Quan (2009) discovered that being non-English speaking presented a potential barrier to receipt of care. Being unable to understand health promotion materials or speakers at health education activities can pose a significant barrier for non-English speaking and non-English fluent AIs. McGruder et al. (2008) reported that non-English speaking or non-English fluent Hispanic adults were less likely to identify heart attack symptoms. Variations and interpretation in language can create difficulties in identifying health care complaints and hinder treatment of non-English speaking patients.

Medical mistrust and dissatisfaction with health care in Native Americans presenting for cancer treatment was studied by Guadagnolo and colleagues (Guadagnolo et al., 2009). Even though this study pertains to problems AIs encounter when presenting for cancer treatment, the findings may be relevant for AIs presenting with ACS symptoms. Guadagnolo et al. (2009) surveyed Native American and non-Native American cancer patients presenting for treatment at a health care facility in Rapid City, South Dakota, with the dependent variables being medical
mistrust and satisfaction with health care and the main independent variable being race (categorized as Native American or White). Native Americans were more likely to distrust health care providers, clinics, and hospitals and were also more likely to express greater levels of dissatisfaction than non-Hispanic Whites. The data revealed that Native Americans tend to seek care later rather than sooner when compared to non-Hispanic Whites; and because of this delay in seeking treatment, the cancer is usually in the advanced stages (Guadagnolo et al., 2009).

Based on the findings of this study, it is evident that a crucial component in the compliance of Native Americans with health care screening or treatment adherence, or even seeking treatment at all, is the presence of trust between patient and provider. Guadagnolo et al. (2009) pointed out the importance of involving Native American communities in health interventions and in the delivery of health care are vital to attempts intended on reducing cancer-related disparities. Establishing trust and delivering culturally competent health care requires complete commitment and involvement between health care providers and Native American communities and is mandatory for successful clinical or public health interventions (Guadagnolo et al., 2009).

The USGAO was asked by the Committee on Indian Affairs of the U.S. Senate to look into the availability of primary care services and ancillary and specialty services for Native Americans (USGAO, 2005). The USGAO visited 13 facilities and conducted interviews with IHS officials from all 12 IHS areas covering all or part of 35 states during October and November 2004. The USGAO found that most IHS facilities offered primary care services such as medical, dental, and vision, but access to these services was not always guaranteed due to length of time between making the initial call to schedule an appointment and the delivery of care, travel distances to IHS facilities, or lack of transportation. It is not uncommon to wait two
to six months for certain types of appointments or travel 90 miles one way to the nearest IHS health care facility. Ancillary and specialty services were found to have limited availability due to lack of offered services. Gaps were discovered in services used to diagnose and treat certain conditions (arthritis, knee injuries, chronic pain), specialty dental care, and behavioral health care. Those sites that did not have the staff or equipment to offer specialty services on site had the option to purchase specialty services and equipment through public and private providers (contract care). Contract care was not always available because care was rationed on the basis of medical need (USGAO, 2005). Officials of IHS facilities reported to the USGAO that gaps in services have resulted in delay of treatment or diagnosis, which in turn resulted in the worsening of severity of a patient’s condition and more intensive treatment. Most IHS facilities lack the specialists and equipment needed to provide safe and effective care for Native Americans with ACS according to ACC/AHA guidelines.

**Knowledge of ACS Symptoms**

What are AIs’ perceptions and extent of knowledge of symptoms of ACS or symptoms of heart attack? The literature search utilizing CINAHL, Medline, OVID, PubMed, the Arizona Health Science Library librarian, Google, and Google Scholar revealed little current published research on heart attack symptom awareness and recognition in AI population. The American Heart Association describes heart attack symptoms as chest discomfort, discomfort in other areas of the upper body (one or both arms, back, neck, jaw, stomach), shortness of breath (with or without chest discomfort), and other signs (cold sweats, nausea, lightheadedness; AHA, 2010a). There is little research done on ethnic or AI variation of acute myocardial infarction presentation. In a study done by King et al. (2009), a comparison of acute myocardial infarction presentation
and access to care was done in European \( n = 117 \), Chinese \( n = 92 \), South \( n = 101 \) and Southeast Asian \( n = 57 \), and First Nation Indian \( n = 39 \) patients admitted to tertiary care centers in Calgary, Alberta, Canada. The top five symptoms reported by First Nations patients during initial presentation were (most common listed first) midsternal pain, shortness of breath, arm pain, nausea or vomiting, and midsternal pressure. The First Nations patients were more likely to report confusion and syncope, compared with other ethnic groups (King et al., 2009).

The Padilla Speer Beardsley Research Group conducted a small study \( (N = 29) \) of AIs in Minnesota and looked at their awareness of signs and symptoms of a heart attack, response to symptoms, and preferred ways to educate the AI community on heart attack symptoms (Kanihan, Einerson, & Ruen, 2008). The most common responses participants reported as symptoms they would expect to occur during a heart attack were pain or numbness in left arm, chest pain, shortness of breath, difficulty breathing, dizziness, and weakness. Significant findings were that the top two reasons reported by study participants for not calling 9-1-1 for suspected heart attack symptoms were the feeling that symptoms were temporary and uncertainty about the nature of the symptoms. Study participants also cited fear of discrimination by health care providers as reasons for not seeking treatment. Researchers concluded that overall, study participants had lack of knowledge of heart attack symptoms (Kanihan et al., 2008). Being aware of ethnic variations of heart attack symptoms is important for health care providers to correctly identify AIAN patients who need emergent treatment for acute myocardial infarction.

Several studies indicated that knowledge of heart attack symptoms was lower in ethnic minority and socioeconomically disadvantaged groups than in non-Hispanic whites (Goff et al., 1998; Greenlund et al., 2004; King et al., 2009; McGruder et al., 2008). Predictors of low levels
of knowledge of heart attack symptoms were male sex, older age, lower socioeconomic status, and less formal education (Goff et al., 1998; Greenlund et al., 2004; McGruder et al., 2008). All these characteristics have been attributed to the AIAN population. Thus these findings indicate that AIANs have lower knowledge of heart attack symptoms than their counterparts. Higher levels of knowledge of ACS were reported among patients who are female, enrolled in cardiac rehabilitation, of younger age, and under the care of a cardiologist (Dracup et al., 2008). There were contradictory findings in the literature about the influence of having a previous history of acute myocardial infarction or coronary heart disease on knowledge of acute myocardial infarction symptoms and coronary heart disease risk factors. Dracup et al. (2008) and Goff et al. (1998) reported that there were no significant differences in knowledge level of acute myocardial infarction symptoms in study participants with prior history of acute myocardial infarction or coronary heart disease risk factors. Greenlund et al. (2004) reported that study participants with hypertension, dyslipidemia, or prior acute myocardial infarction were more likely to recognize heart attack symptoms and call 9-1-1 than those who did not have hypertension, dyslipidemia, or prior acute myocardial infarction.

Health Promotion

Warne (2006) looked into the role of research and education programs as way to decrease health disparities and improve health care in the AIAN population. AIAN health disparities are affected by the underfunding of health programs and lower socioeconomic status among AIANs. The underfunding of federal health care programs is evidenced by data from the National Indian Health Board (2003) that showed per-capita funding was $1805 per person for IHS, $3501 for Medicaid, $5019 for Veterans Administration, and $3489 for the Bureau of Prisons. The
advanced technology offered through specialty services is often not available to AIANs due to imposed limits on health care expenditures secondary to the underfunding of Indian health programs (USGAO, 2005). Adequate funding would allow health care professionals working in AI communities to develop culturally appropriate primary prevention and health care interventions.

Research is key to developing evidence-based interventions and health promotion programs that are culturally appropriate for the AI population. Factors that ensure the success of health research in the AI population are elimination of investigator biases, gain of trust and credibility, and enhancement of AI’s negative perception of sponsoring institutions (Buchwald et al., 2006). Trust, respect, perceived direct benefit, and direct community participation in all phases of the research process are important factors in the successful conduct of research in AI communities (Warne, 2006). In a study conducted by Buchwald et al., (2006), participation and acceptance of health research by AIs was dependent on the conduct of research by trusted entities, involvement of the community, maintaining of confidentiality, compensation of participants, and prompt attention to prominent health concerns of the community. AI health care disparities can be lessened through disease prevention improvements and treatments prospectively offered by research and health education programs (Warne, 2006).

Learning from previously successful health promotion programs developed specifically for the AI population is helpful when developing new health promotion or health prevention programs. The “Steps to a Healthier Anishinaabe” program was designed to improve the health of Michigan’s American Indians through the reduction of the impact of chronic disease on this population (Edgerly et al., 2009). One component of the program was the promotion of a casino
team member wellness program, which was developed through the involvement of a tribal coordinator and casino management and resulted in increased casino employee and community involvement each year. Example of the components of this program were health screenings, health education, nutrition, and fitness consultations, incentive exercise programs, tobacco cessation counseling, and healthy menu options in casino employee cafeterias. This program was such a success among casino employees that it was incorporated into the community. Another component of the “Steps to a Healthier Anishinaabe” program was a community-based physical activity intervention that utilized friendly competition between communities and resulted in the winning community averaging over 1.2 million steps per participant (Edgerly et al., 2009).

“Cherokee Choices” is a diabetes prevention program developed for the Eastern Band of Cherokee Indians and included three components: elementary school mentoring, worksite wellness for adults, and church-based health promotion (Bachar et al., 2006). Some of the successes documented for the components of the “Cherokee Choices” programs are healthier menu options and snacks for elementary school students; increased participation (88% completed the program) and achievement of physical activity goals (56% met goals), weight loss (two-thirds of participants), and a decrease in body fat (one-third lost one or more points in body mass index); and the development of a series of sermons that conveyed the message of the importance of taking care of the physical and spiritual self and initiated the “Walk to Jerusalem” (150 participants each walked an average of 211 miles; Bachar et al., 2006).

The success of the “Steps to a Healthier Anishinaabe” program was attributed to the utilization of a community-based framework consisting of five components: 1) using a tribal coordinator in each community (a member of the community), 2) development of a community...
action plan which outlined the goals and objectives of the program, 3) development and adaption of culturally appropriate and specific best practices for disease prevention and health promotion; 4) provision of continued technical assistance, and 5) being respectful of tribal sovereignty (Edgerly et al., 2009). The “Cherokee Choices” program attributes its success of community involvement and earned respect to the incorporation of community participation in health program development (Bachar et al., 2006). These health promotion programs can serve as models for the development of future interventions for AI communities.

Gaps in Knowledge

Based on the review of literature, there are gaps in knowledge about AI presenting symptoms of ACS, factors determining decision to seek treatment, factors associated with pre-hospital delay, and AI knowledge of symptoms of ACS. Although Moser et al. (2006) found cultural differences in symptom response to ACS and factors associated with pre-hospital delay, future research is needed with larger samples of AIs in order to obtain more precise data on whether symptom response to ACS and pre-hospital delay varies in the AI population. The Struthers, Savik, and Hodge (2004) studied CVD and response behaviors to chest pain in the AI women living on three rural reservations in Minnesota and Wisconsin, but not in men. Further research is needed of response behaviors to ACS symptoms in larger samples of AI men and women. The King and McGuire (2007) study consisted of populations other than AIs and provided valuable information on symptom presentation, time to seek care, and experience expectations of acute myocardial infarction. Research such as the King and McGuire (2007) study, with AIs as the study population, would be invaluable in studying presenting symptoms of
Factors influencing treatment seeking behaviors need to be identified in the AI population. Call et al. (2006) found that AIs reported lack of trust in health care providers, encountered lack of respect from health care providers, and faced discrimination when accessing health care. Future research is needed to determine if these issues influence decisions to seek treatment or pre-hospital delay in the AI population.

There is a gap in knowledge in the AIs’ perceptions and extent of knowledge of symptoms of ACS. Several studies (Goff, et al., 1998; Greenlund et al., 2004; King et al., 2009; McGruder et al., 2008) have been done on heart attack symptoms knowledge and symptom recognition in the non-AI population. Future research is needed on the AIs’ perceptions and knowledge of symptoms of ACS. Providers need to know the extent of knowledge the AI have on ACS and ACS symptoms, so health promotion and prevention programs can be appropriately tailored to this population. Improving AI knowledge on ACS and ACS symptoms may decrease delay in seeking care, thus improving outcomes and decreasing mortality. Research on presenting symptoms of ACS and factor(s) determining the decision to seek treatment, factor(s) associated with pre-hospital delay, and extent of knowledge of ACS among the AI population would be beneficial for advanced practice nurses and other health care providers working with the AI population.

Research Recommendations

More research is needed in the AI population on presenting symptoms of ACS and factors determining the decision to seek treatment, factors associated with pre-hospital delay, and
extent of knowledge of ACS. There are studies that address these issues in non-AI populations but not many are found pertaining to the AI population. ACS symptom presentation and treatment seeking behaviors need to be studied. Specific AI knowledge deficits pertaining to ACS symptoms must also be studied. Finally, future research that utilizes a theoretical framework such as Leventhal’s CSM of illness representation, should pertain specifically to the AI population, especially AI tribes indigenous to the geographic area of study or to the area of practice.

**Summary**

The theoretical framework for a planned Practice Inquiry study is Leventhal’s CSM of illness representation. The major concepts from the framework that are relevant for the planned study are the individual’s beliefs about illness symptoms and the components of identity, timeline, causal, consequences, and curability/controllability. Questions about how AIs label symptoms of ACS, how they connect the symptoms to an expected timeframe, their perceptions of the cause of the symptoms, perceived consequences or anticipated repercussion of the symptoms, and their perceived controllability and responsiveness of the symptoms to self and/or professional intervention will guide the planned study. The review of literature revealed that there are gaps in knowledge of presenting symptoms of ACS and factors determining the decision to seek treatment, factors associated with pre-hospital delay, and extent of knowledge of ACS among the AI population. These gaps in knowledge will guide a planned Practice Inquiry with the AI population to provide a basis for development of culturally tailored evidence-based guidelines for health promotion and educational programs of ACS and ACS symptoms in the AI population.
REFERENCES


