ABSTRACT

THE RELATIONSHIP BETWEEN ILLNESS PERCEPTIONS AND HEALTH-PROMOTING BEHAVIORS AFTER MYOCARDIAL INFARCTION

By Elizabeth A. Wagner

Over half of all Americans who suffer a new myocardial infarction (MI) will have a recurrent MI. Risk for subsequent heart related events could be reduced through the regular practice of health-promoting behaviors (HPB). One area that may impact patients' HPBs is their perception of the MI. The purpose of this study was to investigate the relationship between illness perceptions and HPBs.

Pender's Health Promotion Model served as the primary theoretical framework guiding this research. Additionally, concepts from Leventhal's Common Sense Model of Illness Representations were integrated.

A convenience sample of 40 participants, who suffered a first-time MI treated with angioplasty or stent, was examined in this descriptive, correlational study. Instruments included a demographic questionnaire, the Brief Illness Perception Questionnaire, and the Health-Promoting Lifestyle Profile II. Descriptive statistics and Pearson's *r* were used to describe the sample and evaluate relationships between illness perceptions and HPBs.

The average age of respondents was 63 years and most were male (65%). A significant positive correlation between the illness perception of personal control and overall HPBs, as well as the subscales of nutrition and spiritual behaviors, were identified. Additionally, a significant positive correlation was demonstrated between level of concern and the HPB subscales physical activity and nutrition.

These findings elucidate the opportunities for nursing to influence HPBs. Tailoring patient education strategies to impact illness perceptions, particularly understanding of the seriousness of MI and promoting a sense of control, may influence healthy lifestyle choices and improve outcomes in persons with heart disease.

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CHAPTER I

INTRODUCTION

Coronary heart disease (CHD) begins when hard cholesterol plaques are deposited within the arteries of the heart. This process is called atherosclerosis. These plaques in the coronary arteries can progress and lead to the obstruction of the blood flow to the heart muscle. This obstruction in blood flow supplying the cells of the heart produces the signs and symptoms of CHD, including angina pectoris and myocardial infarction. Angina pectoris is the clinical name for pain in the chest due to CHD. Myocardial infarction (MI) or heart attack is the term used when cardiac cell death has occurred due to the lack of blood flow (Thygesen, Alpert, & White, 2007). In 2004, CHD caused one out of every five deaths in the United States. In 2009, an estimated 785,000 Americans will have a new myocardial infarction and about 470,000 will have a recurrent infarction (Lloyd-Jones et al. 2009). Depending on gender and clinical outcomes, people who survive the acute stage of a heart attack have a morbidity and mortality that is up to 15 times higher than the general population for both men and women (Hurst, 2002). Progress has been made in the treatment of patients with CHD, including thrombolytic agents and percutaneous coronary intervention (PCI). Percutaneous coronary intervention is an invasive procedure that compresses plaque and enlarges the inner diameter of a narrowed coronary artery. By inserting a catheter into the narrowed part of the vessel and inflating a balloon or placing a stent in the artery, PCI restores blood flow to the ischemic heart muscle (Lisspers et al. 2005).

Although PCI is an effective treatment, there is still a risk of continued coronary heart disease progression and of future coronary recurrences (Rosamond et al.).

According to the American Heart Association (AHA), within 6 years after a recognized heart attack, 18% of men and 35% of women will have another myocardial infarction, and about 22% of men and 46% of women will be disabled with heart failure (Hurst, 2002).

In 2005, over 34% (15,892) of all Wisconsin deaths were due to coronary heart disease. The estimated annual total cost of CHD in 2005 was $7.5 billion, equating to over $1000 for every man, woman, and child in Wisconsin. Total costs include both direct costs (health care, provider visits, hospital and nursing home services, medications, home care) and indirect costs (lost productivity). This burden is higher among minority populations (Wisconsin Heart Disease and Stroke Prevention Program, 2008).

Some of the health and economic burden of coronary heart disease can be prevented and controlled through health-promoting behaviors. The importance of a healthy lifestyle in the secondary prevention of CHD has been well documented in the literature (Mosca, 1998; Chiuve, McCullough, Sacks, and Rimm, 2006). The AHA and the American College of Cardiology (ACC) have updated their guidelines for the secondary prevention of coronary heart disease (Smith et al., 2006). The new recommendations are based on compelling evidence from several clinical trials that further support the merits of aggressive risk-reduction therapies for patients with established coronary heart disease. These risk reduction strategies include the adoption of health-promoting behaviors that consist of abstinence from smoking, 30 minutes of physical activity at least 5 days a week, weight management and reduction in overweight and obese individuals, and aggressive lipid management and blood pressure control (Smith et al.).

Since lifestyle-related risk factors play a role in both the initiation and acceleration of the formation of coronary plaques, they influence mechanisms of prognostic importance for CHD (Lisspers et al., 2005). Healthy lifestyle factors, such as tobacco use, diet and exercise habits, weight management, effective management of stress, and the availability of a social support network, can be targets for secondary prevention and rehabilitation efforts in CHD patients (Lisspers et al.). However, lifestyle change is a complex process (Ben-Sira & Eliezer, 1990). Despite the known association between a healthy lifestyle and reduced CHD risk, many people fail to modify their behavior to lower their risk, even after myocardial infarction (Campbell & Torrance, 2005). Although the potential for lifestyle modification and subsequent risk reduction in CHD patients is great, research indicates that considerable improvement is needed in practice (Kotseva, Wood, Debacker, & Debacquer, 2001).

As part of adapting to living with a chronic disease such as CHD, individuals develop illness perceptions that enable them to "make sense" of their symptoms. These perceptions have been found to consist of five components: identity, consequences, cause, timeline, and cure or control (Leventhal, Meyer, & Nerenz, 1980). Identity refers to the label the patient gives to the disease and the associated symptoms. The second component is the patients' beliefs about the personal consequences of the illness. The third component focuses on personal ideas about the cause of the illness, and the fourth focuses on the perceptions of the duration of the illness. The final illness perception is the extent to which the patient feels they can control or recover from the illness (Hagger & Orbell, 2003). Researchers, using a variety of different assessment techniques, have suggested that patients cluster their ideas about an illness around these five coherent themes to form a perception of their illness. The five components together provide a

framework for patients to make sense of their symptoms, assess health risk, and direct action and coping. These perceptions are used for interpreting new symptoms and guiding the individual's subsequent behaviors (Leventhal et al.).

Illness perceptions have been shown to influence a range of health behaviors and outcomes, such as adherence to treatment regimens and patients' disease management behaviors (Horne & Weinman, 2002; Coutu, Dupuis, D'Antono, & Rochon-Goyer, 2003), attendance at cardiac rehabilitation (Whitmarsh, Koutantji, & Sidell, 2003), and functional recovery after an MI (Petrie, Weinman, Sharpe, & Buckley, 1996). Patients who construe their illness as being highly symptomatic, and therefore having a strong illness identity, would have associated views that the illness was uncontrollable, chronic and have serious consequences for their lifestyle. Analogously, patients who construed themselves as having a high degree of control over their illness would view their illness as being less chronic with fewer serious consequences (Hagger & Orbell, 2003). Potentially, myocardial infarction patients may view their illness as an acute event. If a patient remains asymptomatic following percutaneous coronary intervention, their illness representations may be skewed regarding the chronic nature of coronary heart disease, and the adoption of healthy lifestyle behaviors may be negatively impacted (Astin & Jones, 2006).

To date, few studies were identified in the literature that examined the relationship between patients' perceptions of their coronary heart disease and the possible influence those perceptions may have on their health-promoting behaviors. The purpose of this study was to investigate if a relationship exists between patients' illness perceptions and their health-promoting behaviors following a myocardial infarction treated with PCI. This research has the potential to impact future health care

interventions and strategies employed in the post-MI patient. Identifying new or potential areas for interventions and focusing on patients' illness perceptions may influence patients' adoption of lifestyle behavior changes, which is a major strategy for the secondary prevention of heart disease. The future challenge for primary health care providers lies in identifying unique strategies that will lead to these behavioral lifestyle changes.

Significance to Nursing

Despite improved clinical care, heightened public awareness, and widespread use of health innovations, CHD remains the leading cause of death in the United States (Lloyd-Jones et al. 2009). Although guidelines and recommendations regarding lifestyle changes have been presented by the AHA/ACC for the secondary prevention of coronary heart disease (Smith et al., 2006), a recent European study has shown an increased prevalence of smoking and obesity among CHD patients over a 4-year period. While the number of patients with high total cholesterol had decreased, the proportion of patients with hypertension had not improved (Kotseva et al., 2001).

Healthy People 2010 (CDC, 2005), outlines the goals and strategies for promoting the health of all Americans for the first decade of the 21st century. One major goal is to improve cardiovascular health and quality of life through the prevention, detection, and treatment of risk factors. Unhealthy lifestyles are responsible for 55% of mortality in the CHD population, whereas environment was 25%, and genetic factors was 20% *(Healthy People 2010*). Coronary heart disease can be effectively treated through behavioral change and/or pharmacological interventions (Lisspers et al., 2005).

In either case, the individual must make lifestyle adjustments to prevent further cardiac events and mitigate disease risk.

Nurses and Advanced Practice Nurses (APNs) play an important role in educating and motivating patients to attain positive health outcomes. Not all patients have the same perception of their coronary heart disease. In order to motivate and educate patients based on their illness perceptions, APNs must first understand if a relationship exists between illness perceptions and health-promoting behaviors. The presence of this relationship may represent a new therapeutic paradigm for improving secondary prevention strategies for CHD.

The current research study is significant to nursing, as the nursing profession provides holistic care for patients, which implies that physiological, psychosocial, and spiritual factors must be taken into consideration. This philosophy is congruent with the exploration of illness perceptions and health-promoting behaviors. Assessing and modifying illness perceptions and promotion of healthy lifestyle factors, such as tobacco use, diet and exercise habits, weight management, effective management of stress, and the availability of a social support network, encompasses nursing's holistic approach to patient care. Adoption of healthy lifestyle habits can extend overall survival (Iestra et al. 2005), improve quality of life (Rumsfeld et al., 2001), decrease the need for interventional procedures such as PCI and coronary artery bypass grafting (CABG) (Lisspers et al., 2005), and reduce the incidence of subsequent myocardial infarction (Iestra et al.), thus supporting the goals of *Healthy People 2010*.

Problem Statement

Coronary heart disease is the leading cause of death in the United States among men and women. There is currently an estimated 16.8 million individuals living with CHD (Lloyd-Jones et al., 2009). As the aging population continues to expand, the number of individuals living with a diagnosis of CHD will also continue to grow. Although research and technology have helped to improve patient outcomes through the use of new medications, PCI, and CABG, the risk of subsequent myocardial infarctions, sudden death, angina pectoris, heart failure, and stroke for both men and women remains high (Hurst, 2002). An estimated 1,313,000 PCI procedures were performed in the United States in 2006 (Lloyd-Jones et al., 2009). Percutaneous coronary intervention is an effective acute treatment modality for MI; but, secondary prevention with an emphasis on lifestyle modification must be utilized in order to have a positive impact on patient outcomes (Lisspers et al., 2005).

The role of secondary prevention measures to improve health status following an MI is clear. These measures include multifaceted interventions designed to optimize a cardiac patient's physical, psychological, and social functioning. When health-promoting lifestyle changes are undertaken, stabilization, slowing, or even reversal of the underlying atherosclerotic plaque can occur (Lisspers et al.). These lifestyle modifications can reduce the morbidity and mortality after a diagnosis of CHD (Taylor et al., 2004). Although secondary prevention programs provide an important and efficient venue to deliver effective preventive care, the rate of recurrent myocardial infarctions remains alarmingly high (Rosamond et al., 2008). Cardiac rehabilitation programs, thorough patient education, and skilled nursing care are effective in helping patients change some of their health-promoting habits, but many patients do not modify their

lifestyle and suffer recurrent CHD events (Ades, 2001). Clearly, identifying potential factors that may influence a person's health-promoting behaviors is necessary in order to develop effective interventions. One area that may impact patients' health-promoting behaviors is their perception of the event. If patients' perceptions about their MI are inaccurate, their subsequent behaviors may be impacted.

Following PCI after a myocardial infarction, patients may view their illness as an acute event. This may then result in a skewed illness perception regarding the chronic nature of their coronary heart disease, and the adoption of healthy lifestyle behaviors may be impacted. Exploring the potential relationships between illness perceptions and health-promoting behaviors in person following an MI treated with PCI may lay the foundation for future development and testing of interventions that influence illness perceptions and promote healthy lifestyles.

Research Question

What is the relationship between illness perceptions and health-promoting behaviors in persons following an MI treated with PCI?

Definitions of Terms

Conceptual Definitions

Relationship: An aspect or quality that connects two or more things or parts as belonging or working together (Merriam Webster Online Dictionary, 2008).

Patient: An individual under medical care and treatment (Merriam Webster Online Dictionary, 2008).

Myocardial infarction (MI): Cell death of cardiac myocytes caused by a blood clot in the coronary artery interrupting blood supply to the heart muscle (Thygesen et al., 2007).

Percutaneous transluminal intervention: Invasive procedure that is performed in the cardiac catheterization laboratory that compresses the plaque and enlarges the inner diameter of a narrowed coronary artery by inserting a catheter into the narrowed part of the vessel and inflating a balloon or placing a stent in the artery (Lisspers et al., 2005).

Illness perceptions: Illness perceptions are organized cognitive representations of beliefs that patients have about their illness which reflect their personal understanding and previous experience with the symptoms and illness. These representations are used for interpreting new experiences and planning behavior (Leventhal et al.,,1980).

Health-promoting behavior: Individuals' efforts to approach or move toward optimal well-being, personal fulfillment, and a positive state or higher level of health (Pender, Murdaugh, & Parsons, 2006).

Operational Definitions

Relationship: In this study, the relationship is the potential correlation between the individual responses on the Brief Illness Perception Questionnaire (Broadbent, Petrie, Main, & Weinman, 2006) and the total score of the Health-Promoting Lifestyle Profile (HPLP) II (Walker, Sechrist, & Pender, 1995), as well as the subscales of the HPLP II (Walker et al., 1995).

Patient: For the purpose of this study, patient was defined as the study participants. All study participants were patients with a diagnosis of myocardial infarction treated with percutaneous coronary intervention in the previous 6 to 12 months.

Myocardial infarction (MI): A documented discharge diagnosis of myocardial infarction in the medical record upon discharge from the hospital and identified by the subject as their first time suffering a myocardial infarction.

Percutaneous transluminal intervention: Treatment with either angioplasty or stent, or both, to open a narrowed artery and restore blood flow to heart muscle in a person suffering a myocardial infarction.

Illness perceptions: Illness perceptions consist of five components: (a) identity, which refers to the label given to the disease (myocardial infarction) and the associated symptoms (chest pain); (b) the patients' beliefs about the consequences of the illness (physical, social and economic implications); (c) the beliefs about the causes of the illness (stress); (d) the expectancies about the duration of the illness (timeline); and (e) the controllability and/or curability of his or her condition. Illness perceptions were measured using the Brief Illness Perception Questionnaire (Broadbent et al., 2006).

Health-promoting behaviors: Behaviors that promote efforts to approach or move toward a positive state or higher level of health (Pender, Murdaugh, & Parsons, 2006), as measured by the Health-Promoting Lifestyle Profile II (Walker et al., 1995).

Assumptions

This research is based on the following assumptions reflecting both nursing and behavioral science perspectives:

1. Persons are motivated to actively avoid and to maintain functioning within the constraints of illness (Pender et al., 2006).
2. Persons value growth in directions viewed as positive and attempt to achieve a personally acceptable balance between change and stability (Pender et al.).

3. Individuals seek to actively regulate their own behavior (Pender et al.).
4. Coronary heart disease is a chronic illness (Rosamond et al., 2008)
5. Individuals attempt to understand and regulate their medical treatment (Pender et al.).
6. Patients' perceptions of illness, particularly attributions of cause, lend themselves to the construction of a variety of coping mechanisms to actively deal with their disease (Leventhal et al., 1980).
7. Improvement in patients' health-promoting behaviors can reduce the risk of coronary heart disease progression and recurrent myocardial infarctions (Kromhaut, Menotti, Kesteloot, & Sans, 2002).

Chapter Summary

Coronary heart disease continues to have a tremendous impact on the health of the entire country. The purpose of this study was to examine if a relationship exists between patients' illness perceptions and their health-promoting behaviors following an MI treated with PCI. Secondary prevention strategies are crucial to improving patient outcomes following an MI. Identifying new or potential areas for interventions and focusing on patients' illness perceptions may influence patients' adoption of lifestyle behavior changes, a major component of secondary prevention strategies for coronary heart disease.

In this chapter, the background, significance, problem statement, purpose, research question, conceptual and operational definitions, and assumptions of the research were discussed. The theoretical framework used to guide the current research

study, as well as a thorough review of the pertinent literature regarding illness perceptions and health-promoting behaviors, is presented in Chapter II.

CHAPTER II

THEORTICAL FRAMEWORK AND REVIEW OF LITERATURE

Introduction

The purpose of this study was to examine if a relationship exists between patients' illness perceptions and their health-promoting behaviors following an MI treated with PCI. Pender's revised Health Promotion Model (2006) was used as the primary theoretical framework that guided this study. The model supports the belief that a healthy lifestyle should be the goal of all individuals. Additionally, concepts from Leventhal's Common Sense Model (CSM) of Illness Representations (Leventhal et al., 1980) were integrated into the individual characteristics and experiences category of the Health Promotion Model, specifically the psychological factors. The CSM identifies the factors involved in the processing of information by a patient regarding his or her disease or illness, how this information is integrated to provide a lay view of the illness, and how this lay view guides coping behaviors and outcomes. The combination of the two models provided an appropriate framework to assess the relationship between patients' illness perceptions and their health-promoting behaviors following an MI. Finally, a review of the pertinent literature focusing on coronary heart disease, health-promoting behaviors, illness perceptions, and the impact of health promotion in coronary heart disease will conclude the chapter.

Theoretical Framework

Pender et al. (2006) described the Health Promotion Model as a guide for exploring the bio-psychosocial processes which motivate patients to participate in

behaviors directed towards enhancing health. Health promotion is defined as the activities that direct the development of resources to enhance patients' wellbeing. The health promotion framework was designed to assess the areas of poor health practices or habits within the patient's environment and to devise a plan to create healthy bio-psychosocial adjustments. See Figure 1.

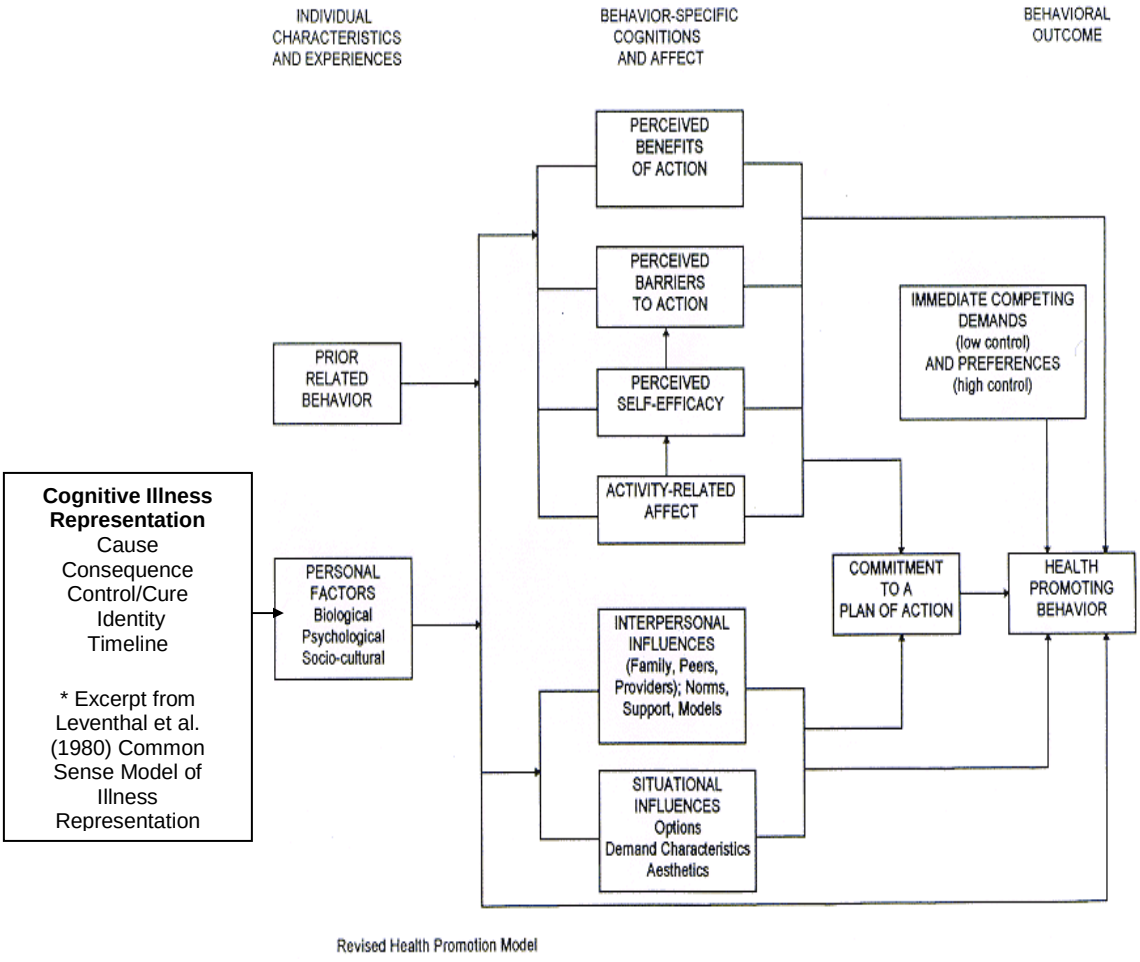

Figure 1. Revised Health Promotion Model.

The Health Promotion Model (HPM) portrays the multidimensional aspects of a person interacting with his or her environment in an effort to pursue health. The HPM is derived from expectancy-value theory and social learning theory (Pender et al., 2006). According to expectancy-value theory, a person will engage in behaviors if the outcome is of positive personal value and if the behavior will bring about the desired outcome. Furthermore, the individual will not invest in striving towards goals that are not of strong value to them or seem impossible to achieve. Social cognitive theory includes an interactional model in which the environment, personal factors, and behavior influence human functioning (Pender et al.).

The Health Promotion Model (HPM) is devised of three main categories, which include individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes (Pender et al., 2006). The following is an explanation of each category.

Individual Characteristics and Experiences

Every person has a unique set of characteristics and experiences that affect their actions. These characteristics include prior related behavior and personal factors. These personal factors may include biological, psychological, and sociocultural factors, and are included in the HPM to capture variables that may be important to a distinct health behavior but not necessarily to all health behaviors (Pender et al., 2006).

Prior Related Behavior

Often, the best predictor of behavior is dependent on the frequency a particular behavior is performed or previous behavior. Repetitive practice of a behavior is likely to result in habit formation. Prior related behavior is proposed to indirectly influence health-

promoting behaviors through perceptions of self-efficacy, benefits, barriers, and activity related affect (Pender et al., 2006).

Personal Factors

Personal factors include biologic, psychological, and socio-cultural factors. Biological factors encompass numerous variables, such as age and gender. Variables included in psychological factors are self-esteem, self-motivation, personal competence, perceived health status, and definition of health. Variables included in socio-cultural factors include race, ethnicity, acculturation, education, and socioeconomic status (Pender et al., 2006). Some of these variables will be studied in this research in relation to health-promoting behaviors.

One of the psychological variables in the personal factors of the HPM is perceived health status. Leventhal's Common Sense Model of Illness Representations identified five dimensions that form a cognitive illness perception and relate directly to the patient's perceived health status. The following are the five dimensions of the illness representation (Leventhal et al., 1980).

1. Identity. Illness identity refers to the label the individual uses to describe the illness and the symptoms they view as part of the disease.
2. Cause. The cause dimension represents the beliefs regarding the factors that are responsible for causing the illness or disease.
3. Consequences. The consequences are the expected effects and outcomes of the disease.
4. Timeline. Timeline refers to the individuals' beliefs about the course of the illness and how long the illness will last.

5. Cure/Control. The cure/control dimension of illness refers to the extent to which the individual believes that he or she can recover from or control the illness.

These five dimensions of illness perceptions are congruent with the personal factors portion of the Pender's Model specifically representing perceived health status.

Behavior-Specific Cognitions and Affect

This category contains six different areas: perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences, and situational influences. The Health-Promoting Lifestyle Profile II (HPLP II) incorporates all six areas of the behavior-specific cognitions and affect category into its statements. The Health Promotion Model defines the six areas (Pender et al., 2006).

1. Perceived benefits of action. Perceived benefits of action are defined as indirect or direct motivational behavior, which determine the extent to commitment to the plan by the patient.
2. Perceived barriers of action. Perceived barriers of action are defined as the patient's anticipated barriers to health-promoting behavior.
3. Perceived self-efficacy. Perceived self-efficacy is defined as judgment of personal capability to create, organize, or complete a particular action.
4. Activity-related affect. Activity-related affect is described as the subjective feelings that happened prior to, during, and following the activity.
5. Interpersonal influences. Interpersonal influences are defined as the concerns that an individual has about others feelings, beliefs, and attitudes. Influence of others may play a highly motivational role for some people and less motivational role for others.

6. Situational influences. Situational influences are described as personal perceptions about a situation that promote or impede behavior. Individuals tend to perform better in environments in which they feel compatible, connected, and safe.

Behavioral Outcomes

The last category of the HPM is behavioral outcomes. This category includes the last portion of the Health Promotion Model, commitment to a plan of action and health-promoting behavior. Behavioral outcomes incorporate the knowledge gained from the first two categories, individual characteristics and experiences, and behavior specific cognitions and affect, to create a commitment to a plan of action. Once the plan is initiated and commitment is established, the endpoint or action outcome is the positive health-promoting behavior. The behavior will be completed unless unavoidable competing demands influence the behavior (Pender et al., 2006).

1. Commitment to a plan of action. The commitment to a plan of action encompasses commitment to carry out an action by identifying strategies for initiating, completing, and reinforcing the behavior. The commitment to action, together with the new strategies that will be used to achieve the action, increase the change of actual behavior performance (Pender et al., 2006)
2. Immediate completing demands and preferences. Competing demands are viewed as alternative behaviors over which individuals have a relatively low level of control because of environmental influences, such as personal responsibilities to family or work. Competing preferences refers to last-

minute urges that may alter behavior. Strong commitment to a behavior may override these completing demands and preferences (Pender et al.).

3. Health-promoting behavior. The HPM endpoint or action outcome is the health-promoting behavior. By performing a health-promoting behavior, individuals are likely to attain positive health outcomes (Pender et al.).

An assessment of health behaviors and perceptions provides a solid foundation for initiating behavior change. “Assessment provides the database for making clinical judgments about the client’s health strengths, health problems, nursing diagnoses, and desired health or behavioral outcomes, as well as the interventions likely to be effective” (Pender et al., 2006, p. 96). A health assessment can reveal lifestyle strengths and health assets; health perceptions and behaviors that may increase disease risk could be revealed; and the client’s plans to change or improve his or her quality of life can be determined (Pender et al.).

The revised HPM, including portions of the Common Sense Model (CSM) of Illness, provides an appropriate framework for the present study. The HPM proposes several variables that may influence the likelihood of one engaging in health-promoting behaviors following a myocardial infarction treated with PCI. One of these variables may be the patient’s illness perception that will be examined in the current research.

Case Study Application

Mr. H is a 48-year-old man who presented to the emergency room diaphoretic, pale, nauseated, and complaining of mid-sternal chest pain radiating into his back and jaw. His wife and daughter accompany him. It is determined that he is suffering a myocardial infarction, and he is taken to the cardiovascular laboratory where he

undergoes percutaneous coronary intervention (PCI) by the cardiologist. Immediately after the procedure, his chest pain has resolved, and he is comfortably resting in bed.

Mr. H is admitted to the Intensive Care Unit for the night. Upon arrival, Mr. H states that he cannot believe that he is already pain free. While completing his admission interview, it is discovered that Mr. H has a high stress job that requires him to travel and eat several meals a week out, smokes one-half pack of cigarettes per day, has a body mass index (BMI) of 30, and rarely has time to exercise. He states that he is married with two children in college and feels that he has a strong social support network. During the interview, Mr. H states that he knows he needs to take better care of himself and states he needs to make some changes in his lifestyle. He states, “I cannot believe that I had a heart attack. Smoking and the stress of my job must be the reason I had this heart attack. It is a good thing that the doctor was able to fix me before it is was too late.” He feels that he should be released from the hospital quickly because he now feels better.

The following morning the patient is transferred to the general floor where cardiac rehabilitation evaluates and enrolls the patient in their program. Mr. H expresses the desire to change several of his lifestyle habits to become healthier. The nurse, the cardiology nurse practitioner, and cardiac rehabilitation staff, provide education that informs Mr. H that his CHD is a chronic condition that requires him to change his lifestyle to prevent future coronary events. Additionally, it is explained that although he is free of symptoms and he will only be hospitalized for 2 days, the PCI did not “cure” his coronary disease. Finally, a plan was individualized to assist Mr. H to quit smoking through a support group and medication, and a registered dietician met with the patient and family and gave them ideas for establishing more healthy eating habits and choices. Finally,

Mr. H agrees to come to cardiac rehabilitation on a regular basis to establish an exercise routine. Mr. H feels that he is able to take on the challenge of the lifestyle changes. He previously exercised regularly with his wife and had quit smoking several years ago until his job became more stressful 1 year ago and he resumed his smoking habit.

Upon follow up with Mr. H, 3 months after his MI, the cardiology nurse practitioner learns that Mr. H has quit smoking, has lost 15 pounds, and continues to exercise with his cardiac rehabilitation program. He remains free of chest pain and is committed to maintaining these lifestyle changes. She praises him for his accomplishments and provides further education to Mr. H about stress management, his medications, and the continued benefits of his healthier lifestyle habits.

Leventhal's Common Sense Model of Illness (1980) guides the perceptions that Mr. H has formed to cope with his myocardial infarction. He expressed the five dimensions of the identity, cause, consequence, timeline, and cure/control of an illness representation. Clearly, some of his perceptions are distorted. The nurses and nurse practitioner are in key positions to help change Mr. H's perceptions of his disease. Continuing education and motivational strategies can help Mr. H grasp the course of his disease, the chronic nature of his CHD, and the lifestyle modification that is necessary to enhance his health. Behavioral change is integral to the improvement of Mr. H's health status, and inaccurate illness perceptions may influence his decision to participate in health-promoting behaviors. These illness perceptions are closely related to Mr. H's perceived health status that is one of the psychological personal factors of Pender's Health Promotion Model.

Pender's Health Promotion Model (Pender et al., 2006) provides guidance to nurses and nurse practitioners as they try to motivate and educate Mr. H to make

positive health changes. By assessing his past and current health practices, along with the personal factors that influence his health, the nurse practitioner can tailor the education and potential psychological support that Mr. H needs to make the changes. Mr. H identified the potential benefits and barriers to lifestyle changes. Identification of both the barriers and benefits of the lifestyle change can assist the nurse and patient to collaboratively formulate a plan to improve his health-promoting behaviors.

Pender et al. (2006) suggest that the most powerful input to self-efficacy is successful performance of a behavior. Mr. H. had been able to abstain from smoking and lose weight. The nurse practitioner can facilitate and reinforce the positive behavioral changes and therefore, enhance Mr. H's feelings of self-efficacy. The activity-related affect refers to the subjective feeling state that occurs prior to, during, and after an activity. These subjective feelings can be both positive and negative (Pender et al.). Mr. H has expressed "feeling great" after exercising, but feels he struggles to abstain from smoking in certain situations. Behaviors that are viewed as positive are more likely to be repeated. Pender et al. suggests that activity related affect influences health behavior directly, as well as indirectly, through self-efficacy and commitment to a plan of action. Mr. H has made the commitment to a plan of action and has followed through with exercise, attendance at cardiac rehabilitation, and continued abstinence from smoking. The nurse practitioner is in a unique position to reinforce and continue to motivate Mr. H for the positive changes that he has made. Change is a difficult process (Ben-Sira & Eliezer, 1990) that requires continued support and education, but provides proven benefits in the secondary prevention of MI. These positive changes can be guided by the underlying principles of Pender's Health Promotion Model.

Review of Literature

The review of literature for this research focused on coronary heart disease, reduction of risk through secondary prevention and health-promoting behaviors, and the role of illness perceptions in patients with coronary heart disease.

Coronary Heart Disease

The coronary arteries are the major blood vessels that supply the heart with blood, oxygen, and nutrients. When these arteries become damaged or diseased, due to a buildup of fatty deposits called plaques, it is known as coronary heart disease. These deposits can slowly narrow the coronary arteries, restricting the blood flow to the heart muscle. Coronary heart disease involves the process of coronary atherosclerosis and its sequelae, angina pectoris, and myocardial infarction. Diminished blood flow may cause pain in the chest, clinically known as angina pectoris. A complete blockage, caused either by accumulated plaques or a ruptured plaque, can cause a myocardial infarction, which occurs when cardiac cells die as a result of the lack of blood flow (Thygesen et al., 2007). Coronary heart disease often develops over decades; therefore, it can go virtually unnoticed until it produces an MI. The progression of coronary atherosclerosis can be limited or reversed through the modification of lifestyle behaviors (Smith et al., 2006). Lifestyle modification is especially important for individuals who have established coronary heart disease (Lisspers et al., 2005).

About every 26 seconds, an American will have a coronary event, and about every minute, someone will die from one (Rosamond et al., 2008). In 2005, coronary heart disease involved 1.2 million hospital stays and was the most expensive condition treated. This condition resulted in $44 billion in expenses. More than half of the hospital stays for coronary atherosclerosis were among patients who also received percutaneous

coronary intervention or cardiac revascularization (coronary artery bypass grafting) (Rosamond et al.). Although the rate of death from CHD has declined (Rosamond et al.), improvement in secondary prevention strategies in persons with CHD could be improved as the disease burden remains high. Of those who have a first MI, the percentage with a recurrent MI or fatal CHD within 5 years is 16% of men and 22% of women, 40 to 69 years of age. At 70 years of age, 24% of White men and women, 30% of Black men, and 32% of Black women will suffer a recurrent cardiac event or death (Hurst, 2002). Adoption of health-promoting behaviors following MI can mitigate risk for recurrent cardiac events.

Health-Promoting Behaviors

Several important health-promoting behaviors that can be targeted for secondary prevention of CHD include tobacco use, diet and exercise habits, weight management, and the effective management of stress.

Smoking acts synergistically with other modifiable risk factors, substantially increasing the risk of CHD. Cigarette smoking is the single most alterable risk factor contributing to premature morbidity and mortality in the United States (Rosamond et al., 2008). One third of those who receive percutaneous coronary artery revascularization are current smokers and 50% to 60% continue to smoke after the procedure. Although 70% of all smokers would like to quit, less than 5% are able to do so without assistance. Current cigarette smoking is associated with all aspects of CHD and is a powerful independent predictor of sudden cardiac death in patients with established CHD (Rosamond et al.).

The relative risk of CHD associated with physical inactivity ranges from 1.5 to 2.4, an increase in risk comparable to that observed for high cholesterol, high blood

pressure, or cigarette smoking (Rosamond et al. 2008). In a recent study, health care providers offered secondary prevention advice to individuals with CHD. Fifty-two percent of patients with CHD were told to be more physically active, 32% met recommended physical activity guidelines, and 30.8% were sedentary (Wofford, Greenlund, Croft, & Labarthe, 2007). Primary care providers are in an ideal position to target and encourage increased physical activity behaviors among patients who have a diagnosis of CHD.

The prevalence of overweight and obesity continues to increase rapidly in the United States, with more than half of all adults currently overweight or obese (Sowers, 2003). People generally become obese because of a combination of inherited genes and a lifestyle consisting of low levels of physical activity and consumption of excess calories. Obesity, especially the central or visceral type, is a predisposing factor for the development of Type II diabetes mellitus, hypertension, and CHD (Sowers). Obesity and Type II diabetes mellitus are associated with insulin resistance. Decreases in visceral adipose tissue contribute to improvements in insulin sensitivity and leads to weight loss. Weight loss leads to the reduction of cardiovascular disease risk, especially in those individuals with established CHD (Sowers).

The growing population of overweight and obese coronary heart disease patients is at high risk for further cardiovascular complications due to elevated risk factors. Considerable weight gain is seen in a high proportion of patients following their cardiac event, even when they have been instructed on the benefit of weight loss and lifestyle modification (Kotseva et al., 2001). Although lifestyle modification can lead to substantial risk reduction in individuals with CHD, it continues to be a challenge for patients and providers alike to attain and sustain these health-promoting behaviors.

A number of studies have shown that adoption of healthy lifestyle behaviors, including diet and exercise habits, weight management, smoking cessation, effective management of stress, and use of supportive social networks, can reduce the occurrence of future CHD and concomitant morbidity and mortality (Iestra et al. 2005).

In the Lifestyle Heart Trial, Ornish, Scherwitz, Billings, and Gould (1998) examined if ambulatory patients could be motivated to make and sustain comprehensive lifestyle changes and whether the progression of coronary atherosclerosis could be stopped or reversed without using lipid-lowering drugs. The randomized experimental group achieved atherosclerotic improvement after 5 years of intensive lifestyle changes that included dietary changes, aerobic exercise, stress management, smoking cessation, and group psychosocial support. In contrast, the control group had continued progression of coronary atherosclerosis and experienced more than twice as many cardiac events. Other studies have also indicated that aggressive interventions aimed at lifestyle modification can slow or even reverse coronary artery disease progression (Kromhaut et al., 2002; Chiuve et al., 2006). The common factors in these successful lifestyle modification programs appear to be an intense and comprehensive format that includes a long duration of contact and follow up.

In a meta-analysis of 37 studies by Dusseldorp, Van Elderen, Maes, Meulman, and Kraaij (1999), the effects of health education and stress management programs for coronary heart disease patients was undertaken. From this research, it is suggested that these programs yielded a 34% reduction in cardiac mortality, a 29% reduction in recurrence of myocardial infarction, and significant ($p < 0.25$) positive effects on blood pressure, cholesterol, body weight, smoking behavior, physical exercise, and eating habits. However, no effects of psycho-educational programs were found in regard to

coronary bypass surgery, anxiety, or depression. This meta-analysis suggests the importance of individualized education strategies to improve lifestyle modification in patients with CHD.

Lisspers et al. (2005) undertook a study to evaluate the effects of a behaviorally oriented cardiac rehabilitation and secondary prevention program in 88 patients recently treated with PCI. The patients were randomly assigned to an intervention with an aggressive focus on lifestyle changes including smoking, diet, exercise, and stress, or to a standard control group. The intervention group had a 4-week residential stay at an interventional unit that consisted of intense group and individually based health education and training activities promoting everyday habitual behavior changes. After the residential phase, there was an 11-month structured maintenance phase of regular follow up contacts between the patient and a case manager through mail and phone calls. The results showed that the intervention group had significantly larger overall lifestyle changes than the control group after 12, 24, 36, and 60 months. The intervention group also had significantly lower rates of all coronary events and cardiovascular mortality. Some of the limitations of the study were the relatively small sample size and the length and intensity of the program, which requires a strong commitment from the participants (Lisspers et al., 2005).

Case management programs for secondary prevention of coronary heart disease that utilize extensive resources can reduce cardiovascular risk factors, but less intensive approaches have failed to show the same benefits. A randomized trial evaluated whether a medium intensity case management program improves risk factor control in patients with coronary artery disease. A risk factor case management program or usual care using cluster randomization was assigned to 201 consecutive patients hospitalized

for acute coronary events in an intensive care unit. The case management program consisted of 1 hour of counseling by a clinician during hospitalization and two short reminders by phone and mail at 3 and 6 months. After 9 and 18 months of follow-up, there were no significant differences in lipid values, blood pressure control, fasting blood glucose, body-mass index, or number of smokers between the two groups. This hospital-based case management and outreach program did not substantially improve cardiovascular risk factor control among patients hospitalized for coronary events (Nordmann, Heilmbauer, Walker, Marina, & Battegay, 2001). Similar findings have suggested that short term or limited contact interventions aimed at lifestyle modification have limited success in secondary prevention of coronary heart disease.

Wister et al. (2007) conducted a randomized control trial in which the participants were assigned either to receive a health report card with counseling from a nurse on smoking, exercise, nutrition, and stress, or to receive usual care. Patients were divided into primary (*n* = 315) and secondary (*n* = 296) prevention groups. The primary outcome was a change in Framingham global risk score between baseline and 1-year follow up. The primary prevention treatment group had statistically significant changes in comparison to the control group in cholesterol reduction, nutrition level, and health confidence. However, there were no significant changes found for the secondary prevention group. This indicates that patients with established coronary artery disease may require innovative or individualized health-promoting strategies and education.

Kotseva et al. (2001) identified and evaluated trends in healthy lifestyles. They compared the European Action on Secondary Prevention by Intervention to Reduce Events (EUROASPIRE I), conducted from 1995 to 1996, with the new study, EUROASPIRE II conducted from 1999 to 2000 by the European Society of Cardiology,

in nine countries. The EUROASPIRE II was conducted to see whether the practice of preventive cardiology in patients with coronary heart disease had improved in the centers that had participated in the EUROASPIRE I. Identified were 525 with coronary heart disease with a diagnosis of either elective or emergent PCI or coronary artery bypass grafting, and data were collected from the medical records, interviews, and physical exams of these patients. Information on personal and family history of CHD, reported medications, and lifestyle information in relation to smoking, diet, exercise, weight, blood pressure, lipids and diet were obtained through an interview. Additionally, body mass index, blood pressure, lipid levels, and measurement of carbon monoxide levels on the participants' breath were measured. The results indicated adverse lifestyle trends. Obesity was substantially increased in every country, and there was an increased prevalence of smoking over a 4-year period. Additionally, the proportion of patients with hypertension had not changed. The findings also suggest that a number of patients did not participate in a cardiac rehabilitation program following the cardiac event even when it was accessible. The findings suggest that there was no improvement in healthy lifestyle trends in the centers that participated in EUROASPIRE I.

Linden and colleagues (Linden, 2000; Linden, Stossel, & Maurice, 1996) demonstrated in two separate meta-analyses that the addition of psychosocial intervention to standard rehabilitation regimes for coronary artery disease patients significantly reduced not only psychological distress, but also coronary recurrences and mortality. However, the risk-reducing effects of psychosocial interventions appeared to diminish over time, becoming nonsignificant 2 years after the original efforts (Linden et al., 1996). The current literature supports that although there is benefit from lifestyle

modification, the need for improvement in secondary prevention strategies of CHD exists.

Illness Perceptions

The Health Promotion Model offers several areas for possible interventions that could improve health-promoting behaviors following an MI. Of particular interest are the psychological factors, including illness perceptions, which may influence behavior following MI. The role of psychological factors in cardiac health has been established. A large, randomized, multi-center trial, Enhanced Recovery in Coronary Heart Disease Patients (ENRICHD), assessed whether morbidity (recurrent myocardial infarction) or mortality would be reduced by psychosocial interventions in 2,481 people hospitalized for acute myocardial infarction associated with depression and low social support. Treatment for depression was provided through cognitive behavior therapy and selective serotonin reuptake inhibitors, when indicated. The ENRICHD intervention did not improve event-free survival; however, both depression and social isolation improved in the intervention and control groups. The results suggest that there is benefit from psychosocial intervention and supportive behavior therapy. Nursing is in a key position to influence patients' perceptions and to help improve the social psychological aspects of health.

Petrie et al. (2002) conducted a prospective randomized study to examine whether a brief intervention designed to alter patients' perceptions about their MI would result in a better recovery and reduced disability. Sixty-five participants were randomly assigned to receive either standard care, which included cardiac rehabilitation and standard MI education, or three 30 to 40 minute intervention sessions conducted by a psychologist in addition to the standard care. The intervention resulted in significant

positive changes in patients' views of their MI. Patients in the intervention group reported that they were better prepared to leave the hospital and returned to work at a significantly faster rate than the control group. At a 3-month follow up, patients who were in the intervention group reported a significantly lower rate of angina symptoms than the control group. Both groups had similar attendance rates at cardiac rehabilitation. Some of the limitations of the study include the small sample size and only a one-time follow up of participants. Additionally, a psychologist was not available to all patients enrolled in a cardiac rehabilitation program. Longer follow up may provide valuable information about the long-term effects of interventions targeted to alter patients' perceptions.

Astin and Jones (2006) examined the changes in patients self-reported illness representations before and after first time elective percutaneous transluminal coronary angioplasty (PTCA). A descriptive, repeated measure design was used. A sample of 117 patients attending a pre-PTCA clinic completed the Illness Perception Questionnaire prior to PTCA and then again at 6 to 8 months post-PTCA. It was discovered that inaccuracies in illness representations were evident, some of which evolved to more realistic representations with time and others that did not. The patients' views shifted from an acute to chronic representation. However, at the 6 to 8 month follow up, the cure/control and consequences representations decreased significantly, indicating that representations regarding personal control over their illness weakened. Additionally, their representation of their illness having serious consequences also diminished. Although this was a small study, it has implications that some of the patients may view PTCA as a cure for their coronary heart disease. Some of the participants had suffered

a previous MI, and the data suggest that they had become accustomed to their diagnosis. This led to a weakening of their views that CHD had serious consequences.

In a study by Campbell and Torrance (2005), 234 patients, 3 to 9 months following elective coronary angioplasty, completed a descriptive survey that included demographic questions and the HPLP II to determine if patients reported any modification in their coronary risk factors. Forty percent of the participants reported the recurrence of chest pain and 42% believed that they no longer had coronary artery disease. Eighty-five percent of the respondents reported making at least one modification to their risk factors, and stress was the most common risk factor identified. Although a convenience sample was used for the study, it provides important information. The results of the study suggest that there is a need for different strategies, perhaps beyond solely educating patients about potential inaccurate perceptions of their CHD. Additionally, the importance of prolonged follow up and continued support after coronary artery angioplasty was suggested, as the patients did not consistently include health-promoting behaviors into their lifestyle following PTCA.

There has been considerable focus on cardiac patients in the illness perception literature. There has been an emphasis on the area of prevention and rehabilitation; although not all studies have found that illness perceptions are predictive of patient outcomes. In a group of myocardial infarction patients, illness beliefs, particularly consequence beliefs, did predict subsequent quality of life (Rumsfeld et al., 2001). The findings of a study by Byrne, Walsh, and Murphy (2005) found that illness perceptions were not strongly related to secondary preventive behavior in a group of patients who were experiencing few cardiac symptoms. Medical and demographic data were gathered from the medical charts of 1,611 patients with established CHD from 35

randomly selected general practices. Self-report data about patients' lifestyles (diet, exercise, smoking, alcohol consumption, and medication adherence) and information on illness and medication beliefs were provided from a postal questionnaire (1,084 patients responded; 69% response rate). The relationship between patients' beliefs and their secondary preventive behavior was examined using regression analyses. The results suggested that illness perceptions appeared to be only weak predictors *of* smoking, exercise, diet, alcohol consumption, and medication adherence, accounting for only about 2% *of* the variance in these behaviors. Medication beliefs were moderately related to medication adherence. A strong belief in the necessity of one's medication and a lower level of concern about one's medication were associated with higher levels of adherence. Illness perceptions did not prove helpful in predicting secondary preventive behaviors in patients experiencing few cardiac symptoms. Some of the limitations of this study include the use of self-report data, and the inclusion criteria were only a general diagnosis of CHD. Additionally, it was not clear if the participants were experiencing any symptoms or what treatment they had received related to their CHD.

In contrast, some components of illness perceptions have been found to be significant predictors of diet and self-efficacy in patients admitted to the hospital with coronary artery disease. A longitudinal prospective cohort survey was conducted to examine the relationship between illness perceptions and measures of self-efficacy in a convenience sample of 253 CHD patients. Those participants that accepted their CHD as a long-term condition (timeline) were more likely to participate in and sustain the treatment regime and attend cardiac rehabilitation. Patients who had a lower illness identity and fewer symptoms had a higher level of confidence in their ability to maintain long-term exercise. Finally, the control/cure perception suggested that those

participants who believed that the disease was controllable had increased confidence in maintaining lifestyle changes long term (Lau-Walker, 2007).

Another area of research is the influence of treatment modality and individual differences, such as gender and ethnicity, on illness perceptions. Hirani, Pugsley, and Newman (2006) evaluated the illness perceptions of patients with coronary artery disease undergoing surgery, angioplasty, or taking medication to treat their illness. The results indicated that the medication group perceived their condition as significantly more long lasting than patients in the revascularization groups. Patients saw the revascularization treatments as providing a cure for the condition, while the decision to begin ongoing medication may have been seen to be reflective of a more enduring condition. This suggests the need for continuing education about the chronic nature of coronary heart disease and the benefit of health-promoting behaviors to mitigate disease risk.

In a qualitative study, MacInnes (2005) examined women's illness perceptions following acute myocardial infarction. A purposive sample of 10 women, 3 months after their acute myocardial infarction, participated in a semi-structured interview. The main findings included that the women perceived stress as the main cause of their illness, and the participants felt that their illness led to a loss of their independence. Additionally, the women viewed the timeline of the illness as episodic. Participants viewed the myocardial infarction as an acute event or episode that may recur. Residual symptoms and the need to take medication left many participants feeling powerless to control the illness and prevent it from recurring. Finally, illness perceptions in relation to lifestyle changes and attendance at cardiac rehabilitation were investigated. Reducing stress through relaxation and slowing down was adopted over making other lifestyle changes because

stress was perceived to be the main cause of the illness. The motivation to participate in cardiac rehabilitation was stronger for younger participants and those that believed it would help increase their independence. The study suggests that women experience significant burden in the recovery period and that their primary concerns focus on psychological and social adjustment, rather than primarily on physical concerns.

Although there is a significant amount of literature regarding patients' illness perceptions in coronary heart disease, conflicting findings exist. Illness perceptions have been shown to have a significant influence on several behaviors following both elective and emergent treatment for coronary heart disease. However, the relationship between illness perceptions and health-promoting behavior following an MI treated with PCI warrants further investigation.

Chapter Summary

The purpose of this study was to investigate the relationship between patients' illness perceptions and their health-promoting behaviors following an MI treated with PCI. The guiding framework for this study was the Health Promotion Model (Pender, Murdaugh, & Parsons, 2006) with the incorporation of concepts from Leventhal's Common Sense Model of Illness (1980). The literature review supported the need for further investigation examining the correlation between illness perceptions and health-promoting behavior in persons treated with PCI after suffering an MI. Further exploration and understanding of this relationship may lead to the development of educational strategies aimed at influencing illness perceptions of coronary heart disease and subsequently impact health-promoting behaviors. In this chapter, the theoretical framework and review of the literature were presented. In Chapter III, the research

design, sample and setting, data collection instruments and procedures, data analysis, and limitations of the study are presented.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to examine if patients' illness perceptions are correlated with their health-promoting behaviors following a myocardial infarction treated with PCI. Demographic characteristics were considered in relation to overall health practices. The research design, sample and setting, data collection instruments, procedures, data analysis procedures, and limitations of the study are presented in this chapter.

Research Design

A non-experimental, ex post facto, correlational design was used for this study. The study focused on the relationship between the patient's illness perceptions and health-promoting behaviors. Data were collected from questionnaires including: demographics, the Brief Illness Perception Questionnaire (Broadbent et al., 2006), and the Health-Promoting Lifestyle Profile II (Walker et al., 1995). The questionnaires were sent anonymously via mail to patients' residences for completion.

There are several variables that may affect an individual's participation in health- promoting behaviors. Due to the non-experimental design of the research study, they were not statistically controlled. These variables include the participants' age, educational level, involvement in a cardiac rehabilitation program, and smoking status.

Population, Sample and Setting

The target population consisted of a convenience sample of 40 patients with a diagnosis of a first myocardial infarction, treated with percutaneous coronary intervention in the previous 6 to12 months, at one Northeastern Wisconsin hospital. A total of 124 surveys were sent out to all patients who had a final discharge diagnosis of MI treated with PCI in the medical record from one Northeast Wisconsin hospital in the previous 6 to12 months. Criteria for sample selection included: (a) discharge diagnosis of myocardial infarction documented in medical record, (b) first myocardial infarction treated with percutaneous coronary intervention in the last 6 to 12 months, (c) 30 years of age or older, and (d) able to read and write English.

Data Collection Instruments

Three instruments were used to collect data: a demographic questionnaire, the Brief Illness Perception Questionnaire, and the Health-Promoting Lifestyle Profile II. The demographic survey (Appendix A) included information to clearly define and describe the sample. The questionnaire contained information about gender, ethnicity, age, education level, marital status, employment, living arrangements, socio-economic status, duration of time since MI, smoking status, and participation in a cardiac rehabilitation program. Smoking status was included in the demographics because smoking acts synergistically with other modifiable risk factors, substantially increasing the risk of CHD. Cigarette smoking is the single most alterable risk factor contributing to premature morbidity and mortality in the United States (Rosamond et al., 2008).

Additionally, researchers have shown that patients who attend cardiac rehabilitation following a myocardial infarction have a greater understanding of their

coronary heart disease and also develop a greater self-confidence in their ability to implement the acquired knowledge to participate in health-promoting behaviors (Moore, Prior, & Bond, 2006). However, only 10% to 20% of eligible patients participate in a cardiac rehabilitation program following MI (Rosamond et al., 2008).

The Brief Illness Perception Questionnaire (Brief IPQ) (Appendix B) was used to assess patients' illness perceptions of their CHD. The tool was adapted from the original Illness Perception Questionnaire (IPQ) (Weinman, Petrie, Moss-Morris, & Horne, 1996) by Moss-Morris et al. (2002) to the Illness Perception Questionnaire -- Revised (IPQ-R). The IPQ-R has over 80 items, which is prohibitive in studies using more than one paper and pencil measure. The Brief IPQ has nine items and provides a short and simple measure of patients' illness perception (Broadbent et al., 2006).

In order to assess illness perceptions, the Brief IPQ uses an 8-item response scale, ranging from 0 to 10, and one open-ended question. Of the eight scale items, five assess the cognitive illness perceptions: consequences (item 1), timeline (item 2), personal control (item 3), treatment control (item 4), and identity (item 5). An open-ended response item assesses the causal perception by asking the patients to list the three most important causal factors in their illness. Additionally, two of the items assess emotional perceptions, including concern (item 6) and emotions (item 8), while one item assesses comprehension of the illness (item 7).

The test-retest reliability of the Brief IPQ was demonstrated by Pearson correlations ranging from 0.42 to 0.75 at both 3-week and 6-week time intervals in a sample of renal patients (Broadbent et al., 2006). Additionally, the predictive validity of the Brief IPQ was confirmed. The Brief IPQ predicted a number of key outcomes following an MI. A multivariate analysis found that those who attended cardiac

rehabilitation had a higher identity score at discharge than those who did not participate in cardiac rehabilitation. It was also demonstrated that slower return to work was significantly associated with a higher level of concern and with higher control beliefs. Finally, discriminant validity of the Brief IPQ was confirmed, as it was able to distinguish predicted distinct patient beliefs between people with diabetes, asthma, colds, MI patients, and outpatients undergoing stress testing (Broadbent et al.).

Permission to use the instrument was obtained from the author (Appendix C). A statement at the top of the instrument was added instructing the participants that the term "illness" represents their heart attack treated by angioplasty or stent.

The final instrument for this study was the Health-Promoting Lifestyle Profile II (HPLP II) created by Walker, Sechrist, and Pender (1995) (Appendix D). The HPLP II is a 52-item instrument that is used to measure health-promoting lifestyles of individuals. Health responsibility, physical activity, nutrition, interpersonal relations, spiritual growth, and stress management are six subscales that measure the major components of a healthy lifestyle (Pender et al., 2006). The tool can be easily administered and provides an assessment of a person's current health practices. Cronbach's alpha for the total HPLP II is 0.94. The alpha coefficients for the six subscales range from 0.79 to 0.87 (Walker, 2007). Permission to use the tool was obtained (Appendix E).

The HPLP II is a 52-item Likert scale instrument intended to measure the major components of a healthy lifestyle. Participants circle one answer per statement reflecting their current habits and feelings in relation to the frequency of participating in each health-promoting behavior. Items are scored on a zero to three scale where 0 = never, 1 = sometimes, 2 = often, and 3 = routinely. Higher scores indicate that healthy behaviors are performed more frequently; a lower score suggests that health-promoting

behaviors are less frequently performed. An assessment of overall health-promoting lifestyle was determined by the mean response of all 52 items. The subscales were also individually measured to determine strengths or weaknesses in any given area. The following is an explanation of the six subscales.

1. Health Responsibility (Subscale 1) consists of nine items relating to taking responsibility for one's own well being through education, seeking necessary medical care when indicated, and current health practices.
2. Physical Activity (Subscale 2) consists of eight items assessing personal fitness and safety measures related to exercise.
3. Nutrition (Subscale 3) consists of nine items dealing with diet selection and consumption habits.
4. Spiritual Growth (Subscale 4) consists of nine items assessing self-concept, spirituality, and feelings towards life purpose.
5. Interpersonal Relations (Subscale 5) consists of nine items dealing with relationships and intimacy with others.
6. Stress Management (Subscale 6) consists of eight items focusing on the identification and use of psychological and physical resources to effectively deal with tension.

Data Collection Procedures

Institutional Review Board (IRB) approval for this study was obtained from the University of Wisconsin Oshkosh (Appendix H) and the IRB of the Northeastern Wisconsin hospital (Appendix I) where the patients had been treated for their MI. The

three survey instruments and a cover letter were mailed to a convenience sample of all persons who underwent PCI for treatment of an MI in the last 6 to12 months at one Northeastern Wisconsin hospital. Individuals willing to voluntarily complete and return the questionnaires were included in the study. All information was obtained anonymously and no data concerning personal identity were obtained. The Quality Resource Specialist/Regulatory Coordinator in the hospital from where patients were solicited compiled a report of all MI patients treated with PCI in the previous 6 to 12 months. The Quality Resource Specialist produced the report and printed address labels for all of the appropriate participants. The secretary in the mail office affixed the labels to the envelopes and mailed the pre-stuffed envelopes to ensure anonymity of the participants.

All patients who had a final discharge diagnosis of MI treated with PCI in the medical record from one Northeast Wisconsin hospital were mailed the three data collection tools along with a cover letter. The cover letter (Appendix F) explained the researcher's purpose, intentions, and human subject's rights in conducting the survey. The participants were informed that participation was voluntary and that they may withdraw at any time without penalty. Additionally, it was explained in the cover letter that if this was not the participant's first MI to please disregard the survey. The questionnaires did not place any participant at risk for injury or harm. Questionnaires were not coded and participants were asked not to place any identifying marks on the returned questionnaires. The survey packet included a demographic questionnaire, the Brief IPQ, the Health-Promoting Lifestyle Profile II, and a self-addressed, stamped return envelope for return of the completed surveys. Both the mailing address and the return address were a post office box. Only the researcher had access to the post office box.

Additionally, 10 to 14 days following the initial mailing, a reminder postcard (Appendix G) was mailed to all of the participants following the same procedure as outlined above. The addresses were compiled as previously noted, and the same secretary affixed the address labels again and placed them in the mail. As there was no way to know who returned the questionnaires, a reminder card was sent to all participants to ask them to complete the questionnaires or thanked them if they had already returned the survey. The mail secretary was fully aware of the Health Insurance Portability and Accountability Act regulations and understood the implications of maintaining the anonymous nature of the data collection procedures.

Data Analysis Procedure

The Statistical Package for the Social Sciences (SPSS) 14 program (Norusis, 2005) was used for data analysis. Descriptive and inferential statistics were used to analyze the data. Descriptive statistics (range, mean, median, mode, standard deviation, and frequencies) were used to examine demographic information. Pearson's *r* correlation coefficient was calculated between the mean score of each of the subscales of the Brief IPQ (consequences, timeline, personal control, treatment control, identity, concern, and emotions) and the mean score of the HPLP II to determine the relationship among the illness perception subscales and health-promoting behaviors. Additionally, Pearson *r* was calculated between the individual subscales on the Brief IPQ and each of the subscales of the HPLP II to determine if any significant correlations exist.

Limitations

1. Use of convenience sample and potential limited generalizability.
2. Potential poor or biased response rate.
3. Potential mono-method bias due to use of self-report survey instruments.
4. Inability to infer a causal relationship between variables due to study design.

Chapter Summary

A total of 124 surveys were sent out to all patients who were identified with a final discharge diagnosis of MI treated with PCI in the medical record from one Northeast Wisconsin hospital in the previous 6 to 12 months. A non-experimental, ex post facto, correlational design was used for this study. The study focused on the relationship between patients' illness perceptions and their health-promoting behaviors following myocardial infarction. A demographic questionnaire, the Brief Illness Perception Questionnaire (Broadbent et al., 2006) and the Health-Promoting Lifestyle Profile II (Walker et al., 1995) were administered. The questionnaires were sent anonymously via mail to patients' residences for voluntary completion. Data analyses and limitations of the study were reviewed. Chapter IV will present the findings of the study and a discussion of the results.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

The purpose of this study was to determine if a correlation exists between participants' illness perceptions and their health-promoting behaviors following an MI treated with PCI. Descriptive statistics were used to describe the sample. Pearson's *r* was used to examine the correlations between each subscale of the BIPQ and the mean score of the HPLP II. Additionally, Pearson's *r* was used to examine the correlation between the individual subscales of the BIPQ and the subscales of the HPLP II.

Demographic Data

A total of 124 surveys were mailed out to all patients who had a final discharge diagnosis of MI treated with PCI documented in the medical record from one Northeast Wisconsin hospital. Since hospital medical records do not distinguish between first-time MI patients and those who had suffered a subsequent MI, participants were asked to complete the survey package if this had been their first MI. If this was not their first MI, they were asked to please disregard the survey. A total of 44 questionnaires were completed and returned. Four participants did not meet the inclusion criteria of first myocardial infarction and were excluded from further data analysis. A final sample size of 40 subjects was achieved.

The sample consisted of 26 males and 14 females. The average age was 63.3 years (*SD* = 13.1) ranging from 31 to 86 years old age. The majority of participants were White (97.5%). The average number of months since subjects suffered their MI was 9.5.

Fifty-five percent of participants did not participate in a cardiac rehabilitation program following MI. The 42.5% of participants who did participate in cardiac rehabilitation attended for an average of 6.9 sessions. The majority of subjects (87.5%) were currently non-smokers and those that had quit smoking reported an average abstinence time of 11.2 months. Demographic characteristics are summarized in Table 1.

Table 1

Demographic Data

	Frequency	Percent
Gender		
Male	26	65.0%
Female	14	35.0%
Marital Status		
Married	24	60.0%
Widowed	8	20.0%
Divorced	3	7.5%
Never Married	5	12.5%
Education		
Grade school or less	3	7.5%
High school	28	70.0%
Trade / vocation school	6	15.0%
College	2	5.0%
Post-graduate work	1	2.5%

(table continues)

	Frequency	Percent
Living arrangements		
Live alone	12	30.0%
Live with spouse / family	25	62.5%
Live with someone else	3	7.5%
Employment		
Working	17	42.5%
Unemployed	3	7.5%
Disabled	6	15.0%
Retired	14	35.0%
Household Income	14	
Less than $20,000	9	35.0%
$21,000 - $35,000	5	22.5%
$36,000 - $50,000	4	12.5%
$51,000 - $65,000	6	10.0%
Greater than $65,000		15.0%
Smoking status	5	
Current smoker	35	12.5%
Non-smoker		87.5%
Cardiac Rehabilitation Participant		
Yes	17	42.5%
No	22	55.0%

Analysis of Brief IPQ Data

All 40 participants completed the Brief IPQ (BIPQ) as a measure of participants' illness perceptions of their CHD. The BIPQ uses an 8-item response scale, ranging from 0 to 10, and one open-ended question. Of the 8-scale items, five questions assess the cognitive illness perceptions: consequences, timeline, personal control, treatment control, and identity. Two of the items assess emotional perceptions including concern and emotions, while one item assesses comprehension of the illness.

Each of the eight items on the BIPQ is treated as an individual scale (Broadbent et al., 2006). A statement at the top of the BIPQ was added explaining that for this study, the word illness referred to the heart attack treated with angioplasty/stent. The first five items of the BIPQ assess the cognitive illness perceptions. *Consequences* addresses the consequences of the illness or how much the illness affects their life. A response of 0 indicates no affect at all, while a response of 10 suggests that the illness severely affects their life. *Timeline* addresses the perception of timeline of the illness, with 0 being a very short time and 10 indicating that the illness will last forever. *Personal Control* addresses the amount of personal control the participants feel over the illness, with 0 meaning absolutely no control and 10 indicating an extreme amount of control. *Treatment Control* refers to the amount that the angioplasty or stent helped the illness, where 0 denotes the treatment did not help at all and 10 indicates that it was extremely helpful. *Identity* addresses the frequency of symptoms experienced as a result of the CHD, with 0 meaning no symptoms at all and 10 meaning many severe symptoms. Two items, *Concern* and *Emotions,* address emotional perceptions of the MI. *Concern* evaluated personal concern for the illness, with a low score revealing less concern over the illness, and increasing scores indicating an increased level of concern.

Comprehension of the illness is also addressed, with 0 indicating no understanding of the illness at all and 10 representing a very clear understanding of the illness. *Emotions* addresses how much the illness affects the participant emotionally, including feelings of anger, fear, and depression. Table 2 displays the means and standard deviations of the eight scales of the BIPQ.

Table 2

Mean Scores of BIPQ Subscales

n = 40	*M*	*SD*
Consequences	3.85	2.93
Timeline	7.74	2.95
Personal Control	6.37	2.42
Treatment Control	8.33	1.68
Identity	2.36	2.60
Concern	6.67	2.39
Comprehension	7.90	1.97
Emotions	3.90	2.78

Note. *M* = mean; *SD* = standard deviation

An open-ended response item assessed the causal perception of the participants CHD by asking the patients to list the three most important causal factors of their illness in rank order. Poor dietary habits were rated as the number one perceived cause for having an MI. Stress was the second most common theme as a cause for MI. Physical inactivity was the third most common reason listed as a cause for MI. Being overweight, hereditary factors, elevated cholesterol, and smoking were also consistently expressed as causal reasons for suffering the MI. Other factors that were cited less frequently as

causal factors included chemotherapy and radiation, medications, medical care, lack of education, or other underlying disease.

Due to the cross sectional nature of the study, a test-retest reliability statistic, as utilized in pervious literature (Broadbent et al., 2006), could not be performed to establish the reliability of scores of the BIPQ in this study.

Analysis of HPLP II Data

All 40 participants completed the HPLP II. The 52 items on the HPLP II contain statements about personal practices considered to be health-promoting. Participants recorded how often they participated in each of the behaviors by circling N for never, S for sometimes, O for often, or R for routinely. The items were scored on a 0 to 3 scale: 0 = never, 1 = sometimes, 2 = often, and 3 = routinely. The overall health-promoting lifestyle was determined by calculating the mean response of all 52 items. The closer the mean is to 3, the more health-promoting the lifestyle. The mean HPLP II score was 1.46 (*SD* = 0.43). The mean scores and standard deviations of HPLP II are reported in Table 3. The highest mean scores for health-promoting behaviors were in the spiritual growth (*m* = 1.73), interpersonal relationships (*m* = 1.72), and nutrition subscales (*m* = 1.69). To test the reliability, the internal consistency of the HPLP II scores was measured using Cronbach's alpha coefficient. The instrument was found to be reliable with an alpha coefficient of 0.92, which is consistent with other research (Walker et al., 1995).

Table 3

Mean Scores of HPLP II and Subscales (n = 40)

Variable	*M*	*SD*
Overall HPLP	1.46	0.43
Subscales		
Health Responsibility	1.18	0.58
Physical Activity	1.05	0.59
Nutrition	1.69	0.49
Spiritual Growth	1.73	0.56
Interpersonal Relationships	1.72	0.51
Stress Management	1.47	0.53

Note. *M* = mean; *SD* = standard deviation

Research Question

The research question posited for the study was, "What is the relationship between illness perceptions and health-promoting behaviors in persons following an MI treated with PCI?" Correlations between the BIPQ subscales and the mean HPLP II scores were explored. Additionally, the subscales of the BIPQ and the six subscales of the HPLP II were examined to identify if significant correlations existed.

BIPQ and Overall HPLP II Correlations

Pearson's *r* was used to examine the correlations between each subscale of the BIPQ and the mean score of the HPLP II (Table 3). A significant positive correlation was demonstrated between the participants' perception of personal control (BIPQ 3) over their MI and their mean health-promoting behaviors ($r = 0.36$, $p = 0.02$). There was a

trend towards a significant positive correlation between the amount of concern the participant had about their MI and their health-promoting behaviors (r = 0.28, p = 0.07) but this was not statistically significant. No other significant correlations were demonstrated.

Table 4

Correlations Between BIPQ Scales and HPLP II Mean

	Pearson's *r* *Mean HPLP II*	
	Correlation Coefficient	*p*
Consequences	-0.02	0.92
Timeline	0.16	0.34
Personal Control	0.36*	0.02
Treatment Control	0.11	0.53
Identity	-0.16	0.34
Concern	0.29	0.07
Comprehension	0.24	0.14
Emotions	-0.78	0.64

Note. * $p < .05$

BIPQ and HPLP II Subscales Correlations

Pearson's *r* was used to examine the correlation between the individual subscales of the BIPQ and the subscales of the HPLP II (Table 5). The six HPLP II subscales are health responsibility (Subscale 1), physical activity (Subscale 2), nutrition (Subscale 3), spiritual growth (Subscale 4), interpersonal relations (Subscale 5), and stress management (Subscale 6). There was a significant positive relationship between the participants' perception of personal control over their MI and health-promoting

behaviors related to nutrition (r = 0.43, p = 0.007). Additionally, a significant positive correlation between the illness perception of personal control over the MI and increased spiritual growth was found (r = 0.35, p = 0.03). The perception of increased personal concern about their MI was statistically positively correlated with health-promoting behaviors in both the physical activity (r = 0.4, p = 0.01) and nutrition (r = 0.4, p = 0.01) subscales. No other statistically significant correlations were found.

Table 5

Correlations Between BIPQ and Subscales of the HPLP II

	HPLP II Subscales					
Subscale	1	2	3	4	5	6
Consequences	0.09	-0.01	-0.69	-0.12	-0.45	0.15
Timeline	0.17	-0.12	-0.51	0.21	0.18	0.10
Personal Control	-0.17	0.27	0.43**	0.35*	0.26	0.23
Treatment Control	-0.01	0.01	0.15	0.13	0.06	0.24
Identity	0.21	-0.10	-0.19	-0.27	-0.21	0.03
Concern	0.14	0.40*	0.40*	0.08	0.10	0.26
Comprehension	0.10	0.38	0.11	0.25	0.16	0.29

Note. HPLP subscales: 1. Health Responsibility, 2. Physical Activity, 3. Nutrition, 4. Spiritual Growth, 5. Interpersonal Relations, 6. Stress Management.

* $p < .05$.

** $p < .01$.

Discussion of Findings

Demographics

The purpose of this study was to examine the relationship between illness perceptions and health-promoting behaviors in persons following an MI treated with PCI. Participants consisted of 40 men and women who had suffered their first MI treated with PCI in the previous 6 to12 months. The mean age of this sample was 63.4 years, which is consistent with the literature. The average age for men to experience a first heart attack is 64.5 years and for women the average age is 70.3 years (Rosamond et al., 2008). The sample in this study consisted of more men (65%) than women (35%). Before age 75, a higher proportion of events due to CHD occur in men than in women (Rosamond et al., 2008), which is also consistent with the current findings.

Smoking status was included in the demographics because smoking acts synergistically with other modifiable risk factors, substantially increasing the risk of CHD and sudden death. One-third of individuals who receive PCI are current smokers and 50% to 60% continue to smoke after the procedure (Rosamond et al.). In contrast to these statistics, only 12.5% of individuals were currently smoking 6 to 12 months after their MI, while 87.5 % were non-smokers, in the current study. However, 55% of the sample reported smoking at one time, and it was not addressed in the demographic questionnaire if the participants were smoking at the time of their MI. Those who had quit smoking reported abstinence from smoking for a mean of 11.2 months, indicating that some of the participants may have quit smoking after the MI, but there was great variation from 1 month to several years.

Patients who attend cardiac rehabilitation following a myocardial infarction have a greater understanding of their coronary heart disease and develop a greater sense of

self-confidence in their ability to implement the acquired knowledge to participate in health-promoting behaviors (Moore, Prior, & Bond, 2006). Forty-three percent of participants in the current study participated in cardiac rehabilitation for an average of seven sessions. This finding is encouraging, as Rosamond et al. (2008) suggest that only 10% to 20% of eligible patients participate in a cardiac rehabilitation program following MI. Researchers have suggested that programs with intensive patient follow-up and education are more successful at maintaining lifestyle changes and health-promoting behaviors (Lisspers et al., 2005).

Although the current findings suggest that over 40% of individuals participated in cardiac rehabilitation after MI, there is room for improvement in recruiting and maintaining patients into cardiac rehabilitation programs. Cardiac rehabilitation is a program for patients who have suffered a heart attack that includes risk factor education, exercise, and counseling. Cardiac rehabilitation programs typically consist of two to three sessions per week and last an average of 3 months or 36 sessions (Squires, Montero-Gomez, Allison, & Thomas, 2008). However, studies have shown that prolonged contact with patients and ongoing cardiac rehabilitation for as long as 3 years improves health-promoting behaviors and lifestyle modification (Squires et al.). The current study found that participants attended an average of only seven sessions of cardiac rehabilitation. This is a limited amount of time to establish and maintain health-promoting habits and educate patients about their CHD. Clearly, the findings of this study suggest improvement is needed in both recruitment and retention in cardiac rehabilitation programs.

Illness Perceptions

Illness perceptions are organized cognitive representations of beliefs that patients have about their illness which reflect their personal understanding and previous experience with the symptoms and illness. These representations are used for interpreting new experiences and planning behavior (Leventhal et al., 1980).

The current findings suggest that the participants perceived treatment with PCI and stent as a helpful treatment for the MI. The mean score on the treatment control scale was 8.3 (scale of 0 to 10), suggesting that people may feel that PCI "cures" or "controls" their CHD. This suggests a skewed illness perception. These findings are supported by research conducted by Astin and Jones (2006), where it was found that patients may view PCI as a cure for their heart disease. However, Astin and Jones also found that control and consequence representations significantly decreased 6 to 8 months after PCI, indicating that representations regarding personal control over their illness weakened. The level of personal control (m = 6.4) in the current research remained strong 6 to 12 months post MI. This difference may be attributable to the fact that Astin and Jones studied stable outpatients undergoing PCI and the current study focused on individuals who suffered an MI.

Finally, the participants in the current study reported a low level of symptoms after the MI (m = 2.4). If a patient remains asymptomatic following percutaneous coronary intervention, their illness representations may be skewed regarding the chronic nature of coronary heart disease and this may potentially impact health-promoting behaviors.

Open-Ended Question Analysis

An open-ended response item on the BIPQ assessed the causal perception of the participants CHD by asking the patients to list the three most important causal factors of their MI in rank order. The data in this study suggested that the number one causal factor of MI was perceived as nutritional habits. In randomized controlled trials, dietary habits affect multiple cardiovascular risk factors, including systolic and diastolic blood pressures, low density lipoproteins (LDL) cholesterol levels, high density lipoproteins (HDL) cholesterol levels, glucose levels, and obesity/weight gain (Lloyd-Jones et al. 2009). Additionally, the growing population of overweight and obese CHD patients is at increased risk for further cardiovascular complications due to elevated risk factors. Considerable weight gain is seen in a high proportion of patients following their cardiac event, even when they have been instructed on the benefit of weight loss and lifestyle modification (Kotseva et al., 2001). The current findings support the perception that nutrition may have contributed to the participants MI, or at least contributed to their level of risk for MI.

The finding that nutrition was the number one perceived cause of MI supports the correlation between the illness perceptions of increased sense of personal control and elevated levels of concern over the illness and the health-promoting behavior of improved nutritional habits. If patients perceived poor dietary habits as the cause of the MI and were concerned about their CHD, it is reasonable to infer that this would be the health-promoting behavior they would target for improvement. Promoting a feeling of personal control over their CHD may improve nutritional habits and may potentially impact other health-promoting behaviors.

Stress was listed as the second most common reason as the cause for MI in this sample. Individual response to stress may be a contributing factor to MI. Some scientists have noted a relationship between coronary heart disease risk and stress in a person's life, their health behaviors, and socioeconomic status (Lloyd-Jones et al., 2009). MacInnes (2005) conducted a qualitative study of 10 women's illness perceptions following MI. Reducing stress through relaxation and slowing down was adopted over making other lifestyle changes because stress was perceived to be the main cause of the illness. The current findings corroborate this research, as stress was perceived to be a contributing cause to suffering an MI.

Physical inactivity was cited as the third most common causal factor for MI in the current study. The relative risk of CHD associated with physical inactivity ranges from 1.5 to 2.4. This represents an increase in risk comparable to that observed for high cholesterol, elevated blood pressure, or cigarette smoking (Rosamond et al., 2008). The perception that physical inactivity was an important casual factor contributing to their MI is consistent with the current literature.

Health-Promoting Behaviors

The mean score of the HPLP II was 1.46. Since the closer the mean is to three, the more health-promoting the lifestyle, this finding indicates a lack of health-promoting behaviors in this sample. Despite the known association between a healthy lifestyle and reduced CHD risk, many people fail to modify their behaviors to lower their risk, even after myocardial infarction (Campbell & Torrance, 2005). The findings of the current study suggest that improved education and/or prolonged contact with patients after the MI may be needed to motivate patients to initiate and maintain health-promoting behaviors. Campbell and Torrance suggest the importance of prolonged follow-up and

continued support after coronary artery angioplasty, as the patients did not consistently include health-promoting behaviors into their lifestyle following PTCA. Lisspers et al. (2005) also found that intensive education and prolonged follow-up improved health-promoting behaviors. Findings from this study corroborate the recommendation for prolonged patient contact and education following MI treated with PCI in order to promote and maintain health-promoting behaviors.

BIPQ and Mean HPLP II Correlations

Only one illness perception subscale, personal control, was found to be significantly and positively correlated with overall HPBs. Byrne, Walsh, and Murphy (2005) also found that illness perceptions were not strongly related to secondary preventive behaviors. Those patients were experiencing few cardiac symptoms. In the current study, the mean score on the BIPQ regarding illness identity and symptoms was 2.36, also indicating a low level of symptoms following MI treated with PCI. The low level of symptoms reported may be related to the low mean score (m = 1.46) on the HPLP II, indicating a lack of health-promoting behaviors. It can be difficult for patients to appreciate the benefits of improving their health-promoting behavior to mitigate their risk of future coronary events if they have little or no outward signs or symptoms of the disease. The current findings are congruent with those of Byrne et al. (2005), as there were no significant correlations found between illness identity (few symptoms from the CHD) and health-promoting behaviors. Wister (2007) suggested that patients with established coronary artery disease may require innovative or individualized health-promoting strategies and education. The findings of this study support this hypothesis. Once a diagnosis of CHD is established, unique strategies to motivate and educate

patients regarding the chronic nature of the disease, especially in asymptomatic individuals, may be warranted.

The level of concern the participants had about their CHD was trending towards a significant positive correlation ($r = 0.29$, $p = 0.07$) with overall health-promoting behaviors. It is difficult to instill concern into individuals about their health. The level of concern in this sample was quite high, with a mean of 6.7. This may be related to the fact that it was the participants first MI. Tod (2008) found that recovery after an MI was depicted as an "enduring journey" in patients 6 to 9 months after suffering an MI. Recovery was affected by a feeling of watchful insecurity, which includes the feeling of concern or anxiety that can be potentiated at any time during the recovery period. The high level of concern among the participants in this sample may be due to the fact that it was the first MI for all of the participants. A feeling of watchful insecurity could explain the continued high level of concern and the trend towards improved overall health-promoting behaviors. However, there remains a need for improvement in both health-promoting behaviors and educating patients about the chronic nature of CHD.

The findings in the current study suggest that there was a high level of understanding regarding the MI ($m = 7.9$) among participants, but this did not correlate with overall health-promoting behaviors. This indicated that people seem to have a fairly good understanding of what causes the MI, but perhaps they are unable to connect the cause (diet, exercise, and stress) to the beneficial effects of health-promoting behaviors. As this was a self-report questionnaire, the participants' actual understanding of CHD was not tested. This may suggest that the participants have a falsely high level of understanding about CHD, or perhaps, education targeting different perceptions about CHD is needed in patients following an MI. Although participants correctly identified

several of the modifiable risk factors for CHD, as seen in the open-ended question, education strategies should address individual patient's perception about why they suffered the MI. Additionally, the individual causal perceptions should be linked to the benefits of health-promoting behaviors that can mitigate the risk of recurrent cardiac events.

BIPQ and Subscales of the HPLP Correlations

A significant positive correlation was found between a strong sense of personal control over the CHD and improved dietary habits. Additionally, a significant positive correlation was demonstrated between an increased level of concern about the MI and improved nutrition. Researchers have suggested that poor nutritional habits and diets high in fats and processed foods have a significantly negative impact on the health of persons with CHD (Kotseva et al., 2001; Lisspers et al., 2005; Sowers, 2003; Smith et al., 2006). Lau-Walker (2007) found some components of illness perceptions to be significant predictors of diet and self-efficacy in patients admitted to the hospital with coronary artery disease. Participants who believed that the disease was controllable had increased confidence in maintaining lifestyle changes long term. These findings are consistent with the positive correlation that was found in this study between a strong sense of personal control over their CHD and improved dietary habits.

Another significant positive correlation was demonstrated between an increased level of concern and improved physical activity. Physical inactivity is responsible for 12.2% of the global burden of heart attack (Lloyd-Jones et al., 2009). Additionally, physical inactivity increases the risk of CHD, comparable to that observed for high cholesterol, high blood pressure, or cigarette smoking (Rosamond et al., 2008). Clearly, education regarding the serious and lifelong nature of CHD is indicated as this illness

perception may impact the adoption of health-promoting behaviors. Although the level of concern an individual has about their CHD is intrinsic, explaining the seriousness of the MI and subsequent consequences may influence improved physical activity levels.

Finally, there was a significant positive correlation between an increased perception of control and spirituality. Spiritual health is the ability to discover and articulate one's basic purpose in life and to experience fulfillment through reaching one's fullest potential (Pender et al., 2006). The appraisal of spiritual health is critical in a holistic approach to health assessment because spiritual beliefs can affect a client's interpretation of life events and health (Chuengsatiansup, 2003). Underwood and Teresi (2002) found that daily spiritual experience is related to decreased use of alcohol, improved quality of life, and positive psychosocial status. A strong sense of spirituality can potentially affect overall health. Therefore, identifying and modifying illness perceptions that positively impact a person's spirituality are desirable.

Chapter Summary

Findings from the current study contribute to the understanding of the relationships that exist between illness perceptions and health-promoting behaviors following MI treated with PCI. Results, interpretation of the findings, and comparison to the current literature were presented in this chapter. While previous researchers have explored the relationship between illness perceptions and health-promoting behaviors, no studies were found that specifically investigate these concepts in persons with MI treated with PCI.

A significant positive correlation between the illness perception of personal control over the CHD and overall health-promoting behaviors, as well as the subscales

of nutrition and spirituality was demonstrated. Additionally, there was a significant positive correlation between the level of concern participants had about their heart disease and the health-promoting behavior subscales of physical activity and nutrition. These findings highlight potential opportunities for advanced practice nurses to tailor patient education strategies to influence specific illness perceptions and subsequently, improve health-promoting behavior in patients who have suffered MI treated with PCI. Chapter V will provide a summary of the study. Implications for practice and recommendations for further research will be addressed.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

A summary of this non-experimental, ex post facto, correlational study that examined the correlation between illness perceptions and health-promoting behaviors in participants following MI treated with PCI in the previous 6 to 12 months is presented in this chapter. Additionally, a discussion of the research conclusions, implications for nursing practice, and recommendations for future research are discussed.

Summary

Healthy People 2010 (CDC, 2005) outlines the goals and strategies for promoting the health of all Americans for the first decade of the 21st century. One major goal is to improve cardiovascular health and quality of life through the prevention, detection, and treatment of risk factors. The promotion of healthier lifestyles by advanced practice nurses and other health care providers in patients following MI can lead to secondary disease prevention, improved patient outcomes, and savings in health care dollars. The purpose of this study was to determine if a correlation exists between illness perceptions and health-promoting lifestyles in individuals following their MI treated with PCI. Institutional Review Board approval was obtained from the University of Wisconsin Oshkosh and one Northeastern Wisconsin hospital. The target population consisted of a convenience sample of 40 patients with a diagnosis of a first myocardial infarction, treated with percutaneous coronary intervention in the previous 6 to 12 months at one Northeastern Wisconsin hospital. The participants who met the inclusion criteria of a

discharge diagnosis of myocardial infarction documented in the medical record, first myocardial infarction treated with percutaneous coronary intervention in the last 6 to 12 months, 30 years of age or older, and able to read and write English were included in the study. A survey package including a demographic questionnaire, the Brief Illness Perception questionnaire, and the Health-Promoting Lifestyle Profile II was mailed to patients.

Pender's revised Health Promotion Model (2006) was used as the primary theoretical framework that guided this study. This model supports the belief that a healthy lifestyle should be the goal of all individuals. Additionally, concepts from Leventhal's CSM (Leventhal et al., 1980) of Illness Representations (Figure 1) were integrated into the individual characteristics and experiences category of the Health Promotion Model. The combination of the two models provided an appropriate framework to assess the relationship between patients' illness perceptions and their health-promoting behaviors following their MI.

This study examined the correlations between participants' illness perceptions and health-promoting behaviors following MI treated with PCI. A convenience sample of 40 individuals participated in this non-experimental, ex post facto, correlational study. Participants completed the demographic questionnaire, the BIPQ (Broadbent et al., 2006), and the HPLP II (Walker et al., 1995). The BIPQ was used to assess participants' cognitive, emotional, and comprehension illness perceptions about their MI treated with PCI. An open-ended response item also assessed the causal perception of the participants CHD.

The participants' health-promoting behaviors were examined by having them complete the HPLP II. The HPLP II contains 52 statements related to six health

promoting subscales: Health Responsibility, Physical Activity, Nutrition, Spiritual Growth, Interpersonal Relations, and Stress Management. A Cronbach's alpha of 0.92 indicated that the HPLP II was highly reliable for measuring the overall health-promoting behaviors.

Descriptive statistics were used to describe the sample. Pearson's *r* was used to evaluate relationships between illness perceptions and health-promoting behaviors. A significant positive correlation was demonstrated between the participants' perception of personal control over their CHD and their total health-promoting behaviors, as well as the subscales of nutrition and spiritual behaviors. Additionally, a significant positive correlation was demonstrated between the level of concern participants had about their heart disease and the health-promoting behavior subscales of physical activity and nutrition. No other significant correlations were identified.

Conclusions

This study was conducted to determine if a relationship exists between illness perceptions and health-promoting behaviors in individuals 6 to 12 months after MI treated with PCI. The following conclusions are drawn from the results of the study.

1. The mean score of the HPLP II was low (*m* = 1.46), indicating a relative lack of health-promoting behaviors in the sample.
2. Participants perceived treatment with PCI as a helpful treatment for MI. The mean score on the treatment control scale was 8.3 (scale 0 to 10), suggesting that people may feel that PCI "cures" and "controls" their CHD and therefore, suggests a skewed illness perception.
3. Participants reported low levels of symptoms following the MI (*m* = 2.36).

4. The data in this study suggest that the three most important perceived causal factors of MI, in rank order, were nutritional habits, stress, and physical inactivity. These are accurate perceptions of potential risk factors that may have contributed to the MI.
5. There was a statistically significant correlation between an increased perception of personal control over CHD and improved overall health-promoting behaviors in this sample.
6. A statistically significant correlation existed between an increased perception of personal control over the CHD and improved nutrition and spiritual growth in this sample.
7. An increased perception of concern about the individuals CHD was significantly correlated with improved physical activity and nutrition in this sample.

Lifestyle change is an important but complex process after a myocardial infarction. Pender's revised HPM, along with concepts from Leventhal's Common Sense Model (CSM) of Illness Representations (Leventhal et al., 1980), was used as the primary theoretical framework that guided this study. The findings of this study are consistent with both the HPM and the concepts of the CSM of Illness Representations. The Health Promotion Model (HPM) portrays the multidimensional aspects of a person interacting with his or her environment in an effort to pursue health. The perceptions of concern and control that individuals form to help process the information regarding their illness and guide coping behaviors and outcomes were correlated with improved health-promoting behaviors. The intentions to perform behaviors and to experience control over facilitators and constraints are important determinants of behavior (Pender et al.,

2006). Significant correlations were found that suggest the psychological perceptions individuals form do impact both overall and individual health-promoting behaviors.

Implications for Nursing Practice

To date, no studies have been found that examined the correlation between participants' illness perceptions and health-promoting behaviors specifically using the BIPQ and the HPLP II instruments. However, the importance of a healthy lifestyle in the secondary prevention of CHD has been well documented in the literature (Mosca, 1998; Chiuve et al., 2006), and illness perceptions have been found to impact the adoption of these health-promoting behaviors. The results of this study indicate that there are significant correlations between certain illness perceptions and health-promoting behaviors in individuals 6 to 12 months after MI treated with PCI within this sample.

Advanced practice nurses, key members of the health care team, help to provide education in a variety of outpatient settings. Advanced practice nurses recognize the value of healthy lifestyle practices. While the practice of health-promoting behaviors is important for all persons, it is especially important for those individuals who have suffered an MI. The findings of this study indicate a need for improvement in the adoption of health-promoting lifestyles in patients with CHD and highlight multiple implications for practice. As specific illness perceptions were found to impact the practice of health-promoting behaviors, educational and interventional strategies can be tailored to influence these perceptions and may subsequently improve health-promoting behaviors.

Demographics

Coronary heart disease (CHD) is the leading cause of death in the United States among men and women (Lloyd-Jones et al., 2009). Advanced practice nurses can promote the overall health of their patients by having a clear understanding of the factors that influence development of CHD. The mean age of participants in this sample was 63 and consisted of more men than women. The APN needs to be aware of these facts and screen appropriately for modifiable risk factors during routine care. In this sample, the age range varied from 31 to 86 years of age, indicating that educating patients about their risk for MI and CHD is appropriate across the lifespan. Additionally, knowledge about the age groups at highest risk for CHD allows the APN to suspect and refer CHD patients appropriately.

Although the current study found that only 12.5 % of the sample in this study were currently smoking 6 to 12 months after MI, 55% of the sample had smoked at one time. Cigarette smoking causes a 2- to 3-fold increase in risk of dying from CHD (Lloyd-Jones et al. 2009). Advanced practice nurses must educate and support efforts of abstinence from smoking, especially in patients with established CHD. Advanced practice nurses can provide education about the health benefits associated with non-smoking and help individuals access support and services for patients who are actively trying to quit smoking. Not only will abstinence from smoking reduce the risk of CHD, it will also decrease overall morbidity and mortality for numerous other diseases (Rosamond et al., 2008).

Advanced practice nurses are in a unique position to influence patients' perceptions and attitudes towards a more health-promoting lifestyle. The use of cardiac rehabilitation programs has been shown to benefit health-promoting behaviors in

patients with a diagnosis of CHD (Smith et al., 2006; Squires et al., 2008). The findings of this study suggest that cardiac rehabilitation is an underutilized avenue to improve the health of patients following MI. When patients did enroll, participation was only for a limited time. Advanced practice nurses can help educate patients about the benefits of cardiac rehabilitation and encourage both the initial and maintenance utilization of these services among patients following MI. If individuals are not able to participate in cardiac rehabilitation, the need for long term follow up and education with the APN is indicated.

Illness Perception

Multiple studies have suggested that although there are established guidelines for the secondary prevention of CHD, many patients whose therapies and lifestyle modification are indicated are not receiving them in clinical practice (Smith et al., 2006). A holistic approach in the treatment of post MI patient's individual needs, including the physical, emotional, spiritual, social, and educational aspects are vital. The results of this study suggest that patients may view their MI as an acute event that is "cured" with PCI. Should patients view their MI as an acute event, they may not correlate this event with the lifelong burden of CHD. Education structured to inform patients about the chronic and serious nature of the CHD, as well as the continued need for health-promoting behaviors, may influence both patient illness perceptions and health-promoting behaviors. Subsequently, this may help mitigate risk for further coronary events.

Evaluating patient's perceived health status following MI is of value to the primary care provider. The current study suggests that participants experienced few symptoms after their MI treated with PCI. It can be difficult to impress upon patients the benefit of treating asymptomatic disease processes and to appreciate the benefits of improving their health-promoting behaviors to mitigate their risk of future coronary events if they

have little or no outward signs or symptoms of the disease. Advanced practice nurses are well-situated to educate individuals after a diagnosis of MI or CHD that the benefits of health-promoting behaviors are life-long and can help reduce the risk of subsequent cardiac events. Additionally, assessment of illness perceptions during routine care and follow up is indicated. If inaccurate illness perceptions exist, the APN can provide education to help correct these misperceptions.

Poor nutritional habits, stress, and lack of physical activity have been associated with an increased risk of MI and CHD (Lisspers et al., 2005). Poor nutritional habits were the number one perceived cause of MI in the current study. Advanced practice nurses are in a unique position to educate and provide tools to individuals about a diet low in fat and cholesterol or the Mediterranean style diet to reduce the risk of recurrent coronary events. In people ages 70 to 90, eating a Mediterranean-style diet, along with greater physical activity, are associated with 65% to 73% lower rates of all-cause mortality, as well as mortality due to CHD, CVD, and cancer (Lloyd-Jones et al. 2009).

An individual or family may be subjected to many different sources of stress prior to or following an MI. Stress was perceived as the second most common causal factor for MI in this study. Advanced practice nurses, together with the patient, can assess the level and sources of current stress, and then determine appropriate interventions or referrals to reduce the stress level. Advanced practice nurses can help individuals change their environment to decrease the incidence of stressors. Additionally, progressive relaxation, meditation, and deep breathing techniques could be taught to help individuals relax and control stress. Regular physical activity has also been positively related to good mental health and decreased feelings of stress (Pender et al., 2006).

The third most common perception cited in the current study as a causal reason for MI was lack of physical activity. Primary care providers are in an ideal position to target and encourage increased physical activity behaviors among patients who have a diagnosis of CHD. The AHA guidelines suggest the promotion of physical activity in older adults should emphasize moderate intensity aerobic activity, muscle strengthening activity, and reducing sedentary behavior (Nelson et al., 2007). Advanced practice nurses and primary health care providers can impact the overall cardiovascular health of their patients by setting attainable physical activity goals in conjunction with their patient population. Additionally, APNs can link these health-promoting behaviors to the literature, illustrating to patients that modifying these behaviors can impact their health and risk of subsequent cardiac events. Ultimately, this may influence a patient's illness perception of control over their CHD and empower them to adopt healthier lifestyles.

Health-Promoting Behaviors

Although the benefits of health-promoting behaviors have been documented in the literature, there is room for improvement as the burden of CHD remains high (Rosamond et al., 2008). The findings of this study indicate a need for improvement in the adoption of health-promoting lifestyles in patients with CHD. Health care providers can educate patients following MI about the multitude of benefits that stress reduction, improved dietary habits, and regular aerobic physical activity can have on their overall health. There are many benefits to HPBs, including weight loss and improved blood pressure control, which are two targets for the risk reduction of recurrent MI (Sowers, 2003). Advanced practice nurses are in ideal positions to motivate and support patients through both close follow-up and positive reinforcement, as patients attempt to adopt more health-promoting behaviors.

Correlations Between Illness Perceptions and Health-Promoting Behaviors

The findings of this study indicate that a stronger sense of personal control over the CHD is correlated with a higher level of overall health-promoting behaviors. Additionally, a significant correlation was found between higher levels of personal control over the CHD and improved nutrition and a stronger sense of spirituality. The AHA and ACC guidelines for the secondary prevention of coronary heart disease support the merits of aggressive risk-reduction therapies for patients with established coronary heart disease, including the adoption of health-promoting behaviors, weight management, stress management, and aggressive lipid management (Smith et al., 2006). If accurate illness perceptions and a strong sense of control over the CHD can be instilled in patients by the advanced practice nurse, there is potential to influence healthier lifestyle choices and improved nutrition, which are both major strategies for the secondary prevention of heart disease.

In this study, a stronger sense of control over the CHD was correlated with a stronger sense of spirituality. Spiritual beliefs and practice can influence the overall health of an individual. Advanced practice nurses strive to provide a holistic approach to health, which includes spiritual well being. A study done by McBride, Arthur, Brooks, and Pilkington (1998) showed a significant correlation between spirituality and health. These findings support the current findings that individual perceptions are related to improved spiritual health. The areas of personal control and spirituality should be assessed during routine care of individuals after an MI. A sense of spirituality throughout the lifespan, particularly in the elderly, may help individuals manage life stressors more effectively (Pender et al., 2006). Assessment of personal perceptions regarding their disease and spiritual well-being is integral to evaluating overall health.

Advanced practice nurses may be able to improve the perception of personal control patients feel over their CHD. Self-efficacy is a perception of personal capability to organize and carry out a particular course of action. "Self efficacy is not concerned with the skill one has but with the judgments of what one can do with whatever skills one possesses" (Pender et al., 2006, p. 53). One way APNs can influence a feeling of control over the CHD and potentially improve health-promoting behavior is by assessing each individual's unique set of circumstances and perceptions about their own capabilities to make positive changes. In the current study, an increased feeling of control was correlated with improved nutrition and increased feelings of spirituality. Discovering and emphasizing the positive health-promoting behaviors that a person can accomplish, or has already established, may instill a sense of self-efficacy and control. Individualized plans of care with a focus on goals and goal attainment, may improve the level of control that patients feel over their CHD, and potentially lead to both improved nutritional habits and increased feelings of spirituality. Ultimately, this may improve the overall health in the patients with CHD, which is one goal of the advanced practice nurse.

The challenge for primary health care providers lies in identifying and testing unique strategies that will lead to these behavioral lifestyle changes. Education regarding the chronic nature of CHD and its serious sequelae may increase the level of concern patients have about their disease. An elevated level of concern was correlated with the health-promoting behaviors of nutrition and physical activity. Both improved physical activity and healthier nutrition choices are targets for risk reduction of recurrent MI. If these health-promoting behaviors can be improved through influencing the

perceived level of concern about CHD, this may be an invaluable asset to advanced practice nurses as they look to improve the overall health of patients with CHD.

Recommendations for Future Research

Based on the findings of this research, the following recommendations for future research are suggested:

1. Replications of this study using a larger sample to increase statistical power and external validity.
2. Inclusion sampling strategies to enhance cultural diversity.
3. Experimental research with tailored interventions focused on patients' illness perceptions to establish causal relationships with health-promoting behaviors.
4. A longitudinal study examining illness perceptions and lifestyle practices over time.
5. Studies examining the frequency and extent to which advanced practice nurses discuss illness perceptions and counsel about health-promoting behaviors in patients who have suffered MI during routine physical exams and follow-up exams.
6. Experimental research tailored to target illness perceptions, particularly personal control perception, and the effect on health-promoting behaviors after MI.
7. Inclusion of measures of depression, self-concept, quality of life, and self-efficacy, and their potential impact on health-promoting behaviors.

Chapter Summary

In this chapter, a summary of this non-experimental, ex post facto, correlational study that examined the correlation between illness perceptions and health-promoting behaviors in participants following MI treated with PCI in the previous 6 to 12 months was presented. Additionally, a discussion of the research conclusions, implications for nursing practice, and recommendations for future research were discussed.

The 2009 estimated total cost of CHD is $165.4 billion (Lloyd-Jones et al., 2009). These costs are staggering. Some of the health and economic burden of coronary heart disease can be prevented and controlled through health-promoting behaviors. Every health care provider needs to be involved and actively participating in both the primary and secondary prevention of CHD. Significant correlations were demonstrated between illness perceptions and health-promoting behaviors in this sample. These findings highlight potential opportunities for APNs to tailor patient education strategies to influence specific illness perceptions and subsequently, improve health-promoting behavior in patients who have suffered MI treated with PCI. The secondary prevention of CHD through adoption of health-promoting behaviors requires that every provider and individual take responsibility to embrace both new and evidence-based strategies to reduce the burden of CHD.

APPENDIX A

Demographic Survey

Today's Date _____

Background Information

This questionnaire will provide a broad description of those participating in the study. All information will remain anonymous. **Please do not include your name on this paper.**

Please read each question carefully. Circle the answer that most closely fits you or insert the appropriate response. Please try to answer every question that applies to you. If none of the answers provided seems exactly right, choose the one that comes nearest to being right for you.

1. **Was the heart attack you had in the last 6-12 months your first heart attack?**

   Yes / No

2. **How many months ago was your heart attack? (Please circle one)**

   6 7 8 9 10 11 12

3. **Did you attend cardiac rehabilitation after your heart attack?**

   Yes / No

   Approximately how many sessions or weeks did you attend cardiac rehabilitation? _____

4. **What is your gender?** Male / Female

5. **What is your Race/Ethnicity? (Please circle one)**

   White, non-Hispanic Black Hispanic Asian Native American Other

6. **What is your age?** _____

7. **What is your highest grade of school completed? (Please circle one)**

   Grade school or less High school Trade/vocational school College Post Graduate work

8. **Are you: (Please circle one)**

   Married Widowed Divorced Never married

9. Which of the following best describes your living arrangements? (Please Circle one)

Live alone Live with spouse/family Live with someone else

10. Are you currently:

Working Unemployed Disabled Retired On leave Other

11. What is your total household income range? (Please circle one)

Less than $20,000 $21,000 – 35,000 $36,000 - $50,000

$51,000 - $65,000 Greater than $65,000

12. Do you currently smoke? Yes / No

If you have quit smoking, how long ago? _____

APPENDIX B

The Brief Illness Perception Questionnaire

The Brief Illness Perception Questionnaire

In the following questionnaire, the word illness refers to your heart attack that was treated with angioplasty/stent. For the following questions, please circle the number that best corresponds to your views:

How much does your illness affect your life?										
0 no affect at all	1	2	3	4	5	6	7	8	9	10 severely affects my life
How long do you think your illness will continue?										
0 a very short time	1	2	3	4	5	6	7	8	9	10 forever
How much control do you feel you have over your illness?										
0 absolutely no control	1	2	3	4	5	6	7	8	9	10 extreme amount of control
How much do you think your treatment (angioplasty/stent) can help your illness?										
0 not at all	1	2	3	4	5	6	7	8	9	10 extremely helpful
How much do you experience symptoms from your illness?										
0 no symptoms at all	1	2	3	4	5	6	7	8	9	10 many severe symptoms
How concerned are you about your illness?										
0 not at all concerned	1	2	3	4	5	6	7	8	9	10 extremely concerned
How well do you feel you understand your illness?										
0 don't understand at all	1	2	3	4	5	6	7	8	9	10 understand very clearly
How much does your illness affect you emotionally? (e.g. does it make you angry, scared, upset or depressed?										
0 not at all affected emotionally	1	2	3	4	5	6	7	8	9	10 extremely affected emotionally
Please list in rank-order the three most important factors that you believe caused your illness. ***The most important causes for me:*** **1.** _____ **2.** _____ **3.** _____										

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APPENDIX C

Permission from Author of the BIPQ

05/07/2008, at 6:21 AM, Elizabeth Wagner wrote:

Dear Ms. Broadbent,

My name is Elizabeth Wagner. I am currently a student at the University of Wisconsin Oshkosh pursuing my Master's degree as a Family Nurse Practitioner. I am interested in using your Brief IPQ tool to research "What is the relationship between myocardial infarction patients' illness representations and their health promoting behavior?". I would collect data using the Brief IPQ, the Health Promoting Lifestyle Profile II (Walker, Sechrist, & Pender, 1995), and some basic demographic information. Please let me know if there is additional information you would like from me or how I can pursue using your tool for my research?

In your publication, The Brief Illness Perception Questionnaire in the Journal of Psychosomatic Research, you mentioned that it is acceptable to change the wording of the questions to include the name of the particular illness. I am hoping to replace illness with coronary artery disease. Would this be acceptable to you?

Finally, I would like to thank you for your time and your fascinating research. Please just e-mail me back with anything further that I need to do.

Thank you,
Elizabeth Wagner

> ----- Original Message -----
> From: Elizabeth Broadbent <lizbroadbent@clear.net.nz>
> Date: Thursday, July 24, 2008 3:15 pm
> Subject: Re: Permission to use the Brief IPQ

Yes that is fine

Regards
Liz

On 26/07/2008, at 3:57 AM, Elizabeth Wagner wrote:

Dear Liz,

Thank you for allowing me to use your instrument and change the wording for my research. Are there any specific scoring instructions? Also, would you be willing to share the alpha reliability coefficient of the instrument in MI patients with me? I did not specifically see this information in your publication. Thank you again for allowing me to use your instrument.

Elizabeth Wagner

From: Elizabeth Broadbent <lizbroadbent@clear.net.nz>
Date: Sunday, July 27, 2008 4:47 am
Subject: Re: Permission to use the Brief IPQ
To: Elizabeth Wagner <wagnee32@uwosh.edu>

Dear Elizabeth

The idea is to treat each item as a separate scale. You can combine some of them if they are highly correlated and it makes sense.

Liz

On 30/07/2008, at 2:33 PM, Elizabeth Wagner wrote:

Dear Ms. Broadbent,

Thank you again for your time and permission to use the Brief IPQ instrument. I have one final question for you. Would it be acceptable to change the word treatment to angioplasty or stent in item 4? I may leave it at treatment but would like the flexibility to specifically use angioplasty or stent if it is deemed appropriate as the research process unfolds. Again thank you for your time.

Elizabeth Wagner

From: Elizabeth Broadbent <lizbroadbent@clear.net.nz>
Date: Sunday, July 30, 2008 5:47 am
Subject: Re: Permission to use the Brief IPQ
To: Elizabeth Wagner <wagnee32@uwosh.edu

Yes it is probably best to be specific about the treatment you are referring to

Regards,

Liz

APPENDIX D

Health-Promoting Lifestyle Profile II (HPLP II)

LIFESTYLE PROFILE

DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habits. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequency with which you engage in each behavior by circling:

N for never, **S** for sometimes, **O** for often, or **R** for rarely

		NEVER	SOMETIMES	OFTEN	ROUTINELY
1.	Discuss my problems and concerns with those close to me.	N	S	O	R
2.	Choose a diet low in fat, saturated fat, and cholesterol.	N	S	O	R
3.	Report any unusual signs or symptoms to a physician or other health professional.	N	S	O	R
4.	Follow a planned exercise routine.	N	S	O	R
5.	Get enough sleep.	N	S	O	R
6.	Feel I am growing and changing in positive ways.	N	S	O	R
7.	Praise other people easily for their achievements.	N	S	O	R
8.	Limit use of sugars and food containing sugar (sweets).	N	S	O	R
9.	Read or watch TV programs about improving health.	N	S	O	R
10.	Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).	N	S	O	R
11.	Take some time for relaxation each day.	N	S	O	R
12.	Believe that my life has purpose.	N	S	O	R
13.	Maintain meaningful and fulfilling relationships with others.	N	S	O	R
14.	Eat 6 – 11 servings of bread, cereal, rice and pasta each day.	N	S	O	R
15.	Question health professionals in order to understand their instructions.	N	S	O	R
16.	Take part in light to moderate physical activity (such as sustained walking 30 – 40 minutes 5 or more times a week).	N	S	O	R
17.	Accept those things in my life which I can not change.	N	S	O	R
18.	Look forward to the future.	N	S	O	R
19.	Spend time with close friends.	N	S	O	R
20.	Eat 2 – 4 servings of fresh fruit each day.	N	S	O	R

		NEVER	SOMETIMES	OFTEN	ROUTINELY
21.	Get a second opinion when I question my health care provider's advice.	N	S	O	R
22.	Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).	N	S	O	R
23.	Concentrate on pleasant thoughts at bedtime.	N	S	O	R
24.	Feel content and at peace with myself.	N	S	O	R
25.	Find it east to show concern, love and warmth to others.	N	S	O	R
26.	Eat 3 – 5 servings of vegetables each day.	N	S	O	R
27.	Discuss my health concerns with health professionals.	N	S	O	R
28.	Do stretching exercises at least 3 times per week.	N	S	O	R
29.	Use specific methods to control my stress.	N	S	O	R
30.	Work toward long-term goals in my life.	N	S	O	R
31.	Touch and am touched by people I care about.	N	S	O	R
32.	East 2 – 3 servings of milk, yogurt or cheese each day.	N	S	O	R
33.	Inspect my body at least monthly for physical changes/danger signs.	N	S	O	R
34.	Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking).	N	S	O	R
35.	Balance time between work and play.	N	S	O	R
36.	Find each day interesting and challenging.	N	S	O	R
37.	Find ways to meet my needs for intimacy.	N	S	O	R
38.	Eat only 2 – 3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.	N	S	O	R
39.	Ask for information from health professionals about how to take good care of myself.	N	S	O	R
40.	Check my pulse rate when exercising.	N	S	O	R
41.	Practice relaxation or meditation for 15 – 20 minutes daily.	N	S	O	R
42.	Am aware of what is important to me in life.	N	S	O	R
43.	Get support from a network of caring people.	N	S	O	R

		NEVER	SOMETIMES	OFTEN	ROUTINELY
44.	Read labels to identify nutrients, fats, and sodium content in packaged food.	N	S	O	R
45.	Attend educational programs on personal health care.	N	S	O	R
46.	Reach my target heart rate when exercising.	N	S	O	R
47.	Pace myself to prevent tiredness.	N	S	O	R
48.	Feel connected with some force greater than myself.	N	S	O	R
49.	Settle conflicts with others through discussion and compromise.	N	S	O	R
50.	Eat breakfast.	N	S	O	R
51.	Seek guidance or counseling when necessary.	N	S	O	R
52.	Expose myself to new experiences and challenges.	N	S	O	R

© S.N. Walker, K. Sechrist, N. Pender, 1995.
For information about this scale go to www.unmc.edu/nursing/

APPENDIX E

Permission to Use the HPLP II

University of Nebraska Medical Center

985330 Nebraska Medical Center
Omaha, NE 68198-5330
402/559-6382
Fax: 402/559-6379

Dear Colleague:

Thank you for your interest in the *Health-Promoting Lifestyle Profile II.* The original *Health-Promoting LifestyleProfile* became available in 1987 and has been used extensively since that time. Based on our own experience and feedback from multiple users, it was revised to more accurately reflect current literature and practice and to achieve balance among the subscales. The *Health-Promoting Lifestyle Profile II* continues to measure health-promoting behavior, conceptualized as a multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization and fulfillment of the individual. The 52-item summated behavior rating scale employs a 4-point response format to measure the frequency of self-reported health-promoting behaviors in the domains of health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations and stress management. It is appropriate for use in research within the framework of the Health Promotion Model (Pender, 1987), as well as for a variety of other purposes.

The development and psychometric evaluation of the English and Spanish language versions of the original instrument have been reported in:

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. Nursing Research, 36(2), 76-81.

Walker, S. N., Volkan, K., Sechrist, K. R., & Pender, N. J. (1988). Health-promoting lifestyles of older adults: Comparisons with young and middle-aged adults, correlates and patterns. Advances in Nursing Science, 11(1), 76-90.

Walker, S. N., Kerr, M. J., Pender, N. J., & Sechrist, K. R. (1990). A Spanish language version of the Health-Promoting Lifestyle Profile. Nursing Research, 39(5), 268-273.

Copyright of all versions of the instrument is held by Susan Noble Walker, EdD, RN, FAAN, Karen R. Sechrist, PhD, RN, FAAN and Nola J. Pender, PhD, RN, FAAN. The original *Health-Promoting Lifestyle Profile* is no longer available. You have permission to download and use the HPLPII for non-commercial data collection purposes such as research or evaluation projects provided that content is not altered in any way and the copyright/permission statement at the end is retained. The instrument may be reproduced in the appendix of a thesis, dissertation or research grant proposal. Reproduction for any other purpose, including the publication of study results, is prohibited.

A copy of the instrument (English and Spanish versions), scoring instructions, an abstract of the psychometric findings, and a list of publications reporting research using all versions of the instrument are available for download.

Sincerely,

Susan Noble Walker, EdD, RN, FAAN
Professor Emeritus
COLLEGE OF NURSING
Community-Based Health Department
985330 Nebraska Medical Center
Omaha, NE 68198-5330

APPENDIX F

Data Collection Tool Cover Letter

Perceptions of Heart Disease and Health Promoting Behavior

My name is Elizabeth Wagner, a graduate student from the University of Wisconsin-Oshkosh, completing the requirements for a Master of Science degree in Nursing. I am conducting a research study to see if the way people view their heart disease affects their lifestyle practices after having a heart attack**.**

The information obtained in this study is completely **anonymous**. All patients who have been treated for their **first** heart attack with angioplasty and/or stent in the past 6-12 months are being asked to participate in this study. If your heart attack within the last 6-12 months was **not** your first heart attack, please disregard this survey and thank you for your time.

The research review boards at UW-Oshkosh and [redacted] Systems have approved this study. A Quality Resource Specialist at the hospital where you were treated for your heart attack generated a list of eligible patients and an employee from the hospital has mailed these questionnaires, but they will have no access to your responses. As the researcher, I have no access to your identity or your medical record. The returned questionnaires will be placed in a locked file and only this researcher will have access to them. At the completion of the project, all of the papers will be destroyed. **Please do not write your name or any identifying information on the questionnaires.**

Your participation in the study is completely voluntary and you may withdraw at any time during your participation without penalty. If you do choose to participate, please fill out the three enclosed questionnaires about yourself, your views about your heart disease, and your current lifestyle practices. Completing the questionnaires takes about 20 minutes. Once completed, place the questionnaires in the self-addressed, stamped envelope provided and mail them. Completion and return of the questionnaires implies that you understand the information provided and agree to participate. A reminder postcard to complete the surveys will be sent out two weeks after the initial mailing using the same process as outlined above.

There are no risks to you for participating in the study, other than the time it takes to fill out the questionnaires. While participating in this study may not benefit you directly, the findings may provide important information about the way patients view their heart disease and how these views relate to their lifestyle practices. Results from this research reported in journals or meetings will be in group form only.

If you have any questions or complaints about your treatment as a participant in this study, please call or write the university:

Institutional Review Board, Chair
For the Protection of Human Participants
c/o Grants Office
University of Wisconsin Oshkosh
Oshkosh, WI 54901
(920) 424-4515

Questions regarding subjects' rights from the hospital where you were treated can be forwarded to:

The chairperson may ask you for your name. However, all complaints are confidential.

Your participation in this research study is appreciated.

Sincerely,

Elizabeth Wagner

APPENDIX G

Reminder Postcard

Reminder Card Sample

Elizabeth Wagner
P.O. Box 93
DePere, WI 54115

Patients name and address were affixed using pre-addressed stickers.

This is just a reminder card. Approximately two weeks ago, you should have received a packet of information in the mail regarding a study that I am conducting to see if the way people view their coronary heart disease affects their lifestyle practices after a heart attack. If you have already completed the questionnaire, I would like to thank you for your time and participation in my study. If you have not completed the questionnaires, I ask that you consider participating in this research.

Thank you for your time and consideration,

Elizabeth Wagner, RN

APPENDIX H

UW Oshkosh IRB Approval Letters

November 26, 2008

Elizabeth Wagner
[redacted]

Dear Ms. Wagner:

Based on the additional materials that you provided, your request for a modification has been approved for the study "The Relationship Between Illness Perceptions and Health Promoting Behaviors After Myocardial Infarction."

Sincerely,

Dr. Frances Rauscher
IRB Chair

cc: Kimberly Udlis

INSTITUTIONAL REVIEW BOARD
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November 26, 2008

Elizabeth Wagner
1860 N. Sunkist Circle
De Pere, WI 54115

Dear Ms. Wagner:

On behalf of the UW Oshkosh Institutional Review Board for Protection of Human Participants (IRB), I am pleased to inform you that your application has been approved for the following research: The Relationship Between Illness Perceptions and Health Promoting Behaviors After Myocardial Infarction.

Your research protocol has been classified as EXEMPT. This means you will not be required to obtain signed consent. However, unless your research involves **only** the collection or study of existing data, documents, or records, you must provide each participant with a summary of your research that contains all of the elements of an Informed Consent document, as described in the IRB application material. Permitting the participant, or parent/legal representative, to make a fully informed decision to participate in a research activity avoids potentially inequitable or coercive conditions of human participation and assures the voluntary nature of participant involvement.

Please note that it is the principal investigator's responsibility to promptly report to the IRB Committee any changes in the research project, whether these changes occur prior to undertaking, or during the research. In addition, if harm or discomfort to anyone becomes apparent during the research, the principal investigator must contact the IRB Committee Chairperson. Harm or discomfort includes, but is not limited to, adverse reactions to psychology experiments, biologics, radioisotopes, labeled drugs, or to medical or other devices used. Please contact me if you have any questions (PH# 920/424-7172 or e-mail:rauscher@uwosh.edu).

Sincerely,

Dr. Frances Rauscher
IRB Chair

cc: Kimberly Udlis
1466

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