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HOPELESSNESS AND DEPRESSION IN MYOCARDIAL INFARCTION

By

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A DISSERTATION

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

DOCTOR OF PHILOSOPHY

College of Nursing

2005

ABSTRACT

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Psychosocial factors, such as depression, have been identified as important predictors of morbidity and mortality in individuals with coronary heart disease; however, little research has been done examining hopelessness in this population. This investigation examined the frequency and severity of hopelessness and depression symptoms in the early recovery period after hospitalization for myocardial infarction (MI), the relationship between hopelessness and depression symptoms, patient characteristics leading to these two constructs, and the effect of hopelessness symptoms on cardiac rehabilitation exercise participation and physical functioning post-MI. A sample of 351 men and women who were hospitalized for MI at five hospitals in central Michigan were interviewed after discharge home (approximately 14 days) and at three months after hospital discharge. Measures included the cognitive expectations factor of the Beck Hopelessness Scale®, Center for Epidemiologic Studies- Depression Scale, a cardiac rehabilitation exercise participation questionnaire, and the Activity Status Index. Both hopelessness and depression symptoms were frequent and moderate to severe in a portion of the sample at baseline and three months, yet depression symptoms significantly decreased from baseline to three months whereas hopelessness symptoms did not. Hopelessness symptoms were strongly associated with symptoms of depression at three months after hospital discharge. However, 10% of the sample had symptoms of hopelessness but minimal or no symptoms of depression, while another 10% had

symptoms of depression but minimal or no hopelessness symptoms. There were some differences in baseline patient characteristics leading to hopelessness symptoms versus depression symptoms. In addition, baseline hopelessness symptoms were predictive of not starting a hospital-based cardiac rehabilitation exercise program and of quitting a hospital-based exercise program early, whereas depression symptoms had no such effect. Both hopelessness and depression symptoms at baseline accounted for an independent portion of variance in physical functioning at three months after hospital discharge. This descriptive study is an important early step in the research of hopelessness symptoms after an acute MI. Longitudinal modeling of the pathways among hopelessness symptoms, depression symptoms, and health-related outcomes is needed to further discern the relationship between hopelessness and depression symptoms, the distinction of these two constructs, and their effects on post-MI outcomes.

**This work is dedicated to all of the individuals with coronary heart
disease who I have been privileged to care for over the years.**

ACKNOWLEDGEMENTS

Barbara Given, Ph.D., R.N., FAAN, is especially recognized for her outstanding guidance and support as Dissertation Committee Chairperson. Her high standards and continual encouragement were essential to the success of this project.

Margaret Holmes-Rovner, Ph.D., is acknowledged for her guidance as a Dissertation Committee member and as the leader of the HARP study team. Her generosity in sharing the HARP study experience and data is most appreciated.

Audrey Gift, Ph.D., R.N., FAAN, and Linda Spence, Ph.D., R.N., Dissertation Committee members, are recognized for their considerable guidance and support.

Linda Scott, Ph.D., R.N. is acknowledged for her assistance as a consultant to the Dissertation Committee and for her ongoing support. Manfred Stommel, Ph.D., is recognized for his assistance as a consultant to the Dissertation Committee.

A special thank you to Anita Jablonski, Ph.D., R.N., and Amy Hoffman, M.S.N., R.N., for sharing the doctoral experience with me.

Most importantly, immeasurable gratitude is expressed to my husband, Randy, and children, Matthew, Kristen, and Kara, for their unending support and encouragement.

Funding sources for this project include the National Institutes of Health, National Institute of Nursing Research, Ruth L. Kirschstein National Research Service Award (NR82972) (Dunn); Blue Cross Blue Shield of Michigan Foundation (Dunn); Sigma Theta Tau, Kappa Epsilon Chapter-at-Large (Dunn); and AHRQ R01 grant (HS10531), “Translating Research: Patient Decision Support/Coaching” (Holmes-Rovner).

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Chapter 1

INTRODUCTION

Coronary heart disease (CHD) and depression are highly prevalent, comorbid health problems associated with substantial morbidity and mortality. CHD is a leading cause of mortality among American men and women (American Heart Association [AHA], 2004), while depression affects 12% of women and 7% of men (National Institute of Mental Health [NIMH], 2002). Depression symptoms tend to be more prevalent in the CHD population than in the general population (Ariyo et al., 2000; Frasure-Smith, Lesperance, & Talajic, 1993; Travella, Forrester, Schultz, & Robinson, 1994). This is particularly true after an acute CHD event, such as a myocardial infarction (MI). Depression symptoms have been found predictive of increased morbidity (Levine et al., 1996) and mortality (Barefoot et al., 2000; Frasure-Smith, Lesperance, & Talajic, 1995; Frasure-Smith et al., 2000; Travella et al.) following a MI.

A construct related to depression, but less well understood, is hopelessness. Its role in recovery from heart disease events is potentially important, and previously understudied. Hopelessness has been associated with the presence of depression in individuals coping with physical illness (Brietbart et al., 2000; Cochinov, Keith, Murray, & Landers, 1998; Lewis, Dennis, O'Rourke, & Sharpe, 2001; Northouse, Jeffs, Cracchiolo-Caraway, Lampman, & Dorris, 1995; Northouse, Templin, & Mood, 2001; VanServellen, Sarna, Padilla, & Brecht, 1996; Watson, Haviland, Greer, Davidson, & Bliss, 1999). Symptoms of hopelessness have been associated with increased risk of fatal and nonfatal CHD and MI (Anda et al., 1993; Barefoot, Brummett, Helms, Mark, Siegler, & Williams, 2000; Everson et al., 1996). However, no research has been found examining the frequency,

severity, and impact of hopelessness symptoms after hospitalization for a MI or describing the relationship between symptoms of hopelessness and depression after a MI.

Although relationships between CHD and depression outcomes and between symptoms of hopelessness and depression have been documented, minimal research has been done to examine the relationships among hopelessness symptoms and outcomes of CHD. Research has demonstrated that depressed MI patients are at greater risk of quitting hospital- and home-based cardiac rehabilitation exercise programs than non-depressed MI patients (Glazer, Emery, Frid, & Banyasz, 2002; Ziegelstein, Fauerbach, Stevens, Romanelli, Richter, & Bush, 2000). In addition, depression symptoms have been negatively correlated with physical functioning in CHD patients attending an outpatient cardiac rehabilitation exercise program (Ades, Maloney, Savage, & Carhart, 1999; Blumenthal et al., 1997). However, no research has been found examining the relationships among hopelessness symptoms and cardiac rehabilitation exercise participation or physical functioning post-MI.

This study was designed to answer the following questions:

- 1) What is the frequency and severity of hopelessness symptoms and depression symptoms among post-MI patients at three-months after hospital discharge?
- 2) What is the relationship between hopelessness and depression symptoms among post-MI patients at three-months after hospital discharge?
- 3) For those post-MI patients who have hopelessness symptoms at three-months after hospital discharge, what factors present at baseline are predictive of their three-month hopelessness scores?

- 4) Are hopelessness symptoms at baseline predictive of participation in cardiac rehabilitation exercise and physical functioning among post-MI patients at three-months after hospital discharge?

The purpose of Chapter 1 is to provide an overview of depression and hopelessness in CHD. First, brief definitions of CHD and MI will be presented. Next, definitions of both hopelessness and depression will be discussed. The frequency of CHD and depression as comorbid problems will be presented. This will be followed by a discussion regarding the associations between hopelessness and depression and the relationship between hopelessness and CHD. Chapter 1 will conclude with a discussion regarding cardiac rehabilitation exercise participation and physical functioning post-MI and their relationships with depression and hopelessness. Chapter 1 will provide the background for the development of the study's conceptual framework, which is discussed in Chapter 2.

Definitions of Coronary Heart Disease, Myocardial Infarction, and Acute Coronary Syndrome

According to the American College of Cardiology (ACC)/American Heart Association (AHA) Task Force on Practice Guidelines, coronary artery (heart) disease (CHD) refers to the atherosclerotic narrowing of one of the coronary arteries (Braunwald et al., 2002). CHD can lead to acute myocardial infarction (MI) or unstable angina. Clinically, the diagnosis of a MI is typically made when there is a characteristic rise and fall in cardiac biomarkers (e.g. troponin) indicative of myocardial necrosis, and may be referred to as an enzyme-diagnosed MI or biomarker-diagnosed MI (Braunwald et al.). Depending on electrocardiogram findings, a MI may also be titled a ST elevation MI,

non-ST elevation MI, or non-Q wave MI. An MI may be diagnosed after the rise and fall of cardiac biomarkers solely by ECG changes, and this is titled a late ECG-diagnosed MI. Patients with unstable angina do not present with ST-segment elevation on their electrocardiogram and do not release biomarkers indicative of myocardial necrosis into the blood (Braunwald et al.).

Acute coronary syndrome is any constellation of clinical signs and symptoms suggestive of MI or unstable angina. This syndrome includes patients with enzyme-diagnosed MI, biomarker-diagnosed MI, ST elevation MI, non-ST elevation MI, non-Q wave MI, late ECG-diagnosed MI, and unstable angina. The term acute coronary syndrome is used prospectively to identify those patients at a time of initial presentation who should be considered for treatment of acute MI or unstable angina (Braunwald et al., 2002).

Definitions of Hopelessness and Depression

Hopelessness is defined in this proposal as a psychological response to a negative event, consisting of a negative expectancy concerning one's future and an expectation of helplessness in changing one's future (Abramson, Alloy, & Metalsky, 1989). According to the Theory of Hopelessness Depression, hopelessness can be a precursor of depression or can be independent of depression (Abramson et al.). Depression is defined in this proposal as the presence of depressed mood and/or loss of interest or pleasure in activities in addition to several other depressive symptoms, including weight loss or gain, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness or excessive guilt, diminished ability to think or indecisiveness, or recurrent thoughts of suicide or death (American Psychiatric Association, 2000).

Depression and Coronary Heart Disease

Depression is the leading cause of disability worldwide, with approximately 19 million American adults affected per year (NIMH, 2002; World Health Organization [WHO], 2001). Coronary heart disease (CHD) is a leading cause of death in the United States, with an estimated 12,400,000 Americans currently living with CHD (AHA, 2004). CHD and depression are rightfully identified as public health priorities by a number of agencies. The WHO predicts heart disease and depression to be the top two leading causes of disease burden in year 2020, while the NIMH identifies the co-occurrence of depression with CHD as a key research priority.

The prevalence of depression symptoms among individuals who have survived a MI is estimated to be 16% to 28% (Ariyo et al., 2000; Frasure-Smith et al., 1993; Travella et al., 1994). Major depression symptoms have been found in 26% of patients at three-months, 21% at 6 months, 28% at nine months, and 16% at 12 months post-MI (Travella et al.). The median duration of depression symptoms post-MI has been reported as 4.5 months (Bush et al., 2001), while depression symptoms have been related to mortality at four months (Travella et al.), six months (Frasure-Smith et al., 1993), twelve months (Frasure-Smith et al., 2000), and eighteen months (Frasure-Smith et al., 1995) post-MI. Depression symptoms, if left untreated, have been found to reoccur or be persistent in CHD patients. In a study of 200 CHD patients, 17% were diagnosed with major depression and 17% were diagnosed with minor depression (Hance, Carney, Freedland, & Skale, 1996). Of those with major depression, 50% remained depressed over a 12 month period or relapsed within the 12 months, while 42% of those with minor depression subsequently developed major depression in the 12 month interval (Hance et

al.). Although the relationship between depression and CHD is well documented, minimal research has been done to examine the relationship between CHD and hopelessness. Additionally, the relationship between hopelessness and depression is not well understood.

Hopelessness and Depression

Hopelessness has been related to depression in some studies, yet has been found to be independent of depression in other studies. Hopelessness has been found to increase vulnerability to a subtype of depression, titled hopelessness depression, in college students (Alloy et al., 1999), outpatient psychiatric clients, and air force cadets (Joiner, Steer, Abramson, Alloy, Metalsky, & Schmidt, 2001). Hopelessness, beginning as a precursor, has been found to continue in conjunction with this subtype of depression in some patients (Joiner et al.) (see Chapter 3 for further elaboration of hopelessness depression). Hopelessness has also been identified as a mediator between depression symptoms and social support in men with HIV (Johnson et al., 2001). Although baseline hopelessness was predictive of increased depression in the study by Johnson and colleagues, baseline depression was not found to be predictive of increased hopelessness.

Symptoms of hopelessness and depression have been related to suicidal ideation in individuals with advanced terminal cancer (Cochinov et al, 1998) and suicidal ideation and suicide in psychiatric patients (Beck, Steer, Beck, & Newman, 1993); however, symptoms of hopelessness were found to be a more important and independent predictor in both of these studies. In a study of terminally ill cancer patients, hopelessness predicted desire for hastened death, independent of depression (Breitbart et al., 2000). A study among stroke survivors found hopelessness related to long-term survival,

independent of depression (Lewis, Dennis, O'Rourke, & Sharpe, 2001). Hopelessness has also been found predictive of hypertension, after adjusting for depression and CHD risk factors (Everson, Kaplan, Goldberg, & Salonen, 2000). Though a fair amount of research has been done examining hopelessness and depression in physically ill populations, minimal work is reported in the literature examining hopelessness in individuals with CHD.

Hopelessness and Coronary Heart Disease

Only a small number of studies have examined the relationship between hopelessness and CHD. Of particular importance to this investigation are three large studies that examined hopelessness in conjunction with CHD in cohorts followed over varying lengths of time. In the National Health Examination Follow-Up Study, the relative risk of fatal CHD among 2,832 initially healthy American men and women for a moderate level of hopelessness was 1.6 (95% confidence interval: 1.0, 2.5) and for a severe level of hopelessness was 2.1 (95% confidence interval: 1.1, 3.9) (Anda et al., 1993). The relative risk of nonfatal CHD for moderate and severe levels of hopelessness were 1.3 (95% confidence interval = 0.8 to 2.0) and 1.9 (95% confidence interval = 1.0 to 3.6) respectively. Hopelessness was more strongly related to morbidity and mortality than depression (Anda et al.).

In the Finnish Kuopio Ischemic Heart Disease study, high levels of hopelessness were associated with cardiovascular mortality ($n = 87$) among 2,428 men (Everson et al., 1996). The moderately hopeless men were at more than twice the risk (Relative Hazards = 2.52 [95% confidence interval: 1.52, 4.17] and the highly hopeless men at more than three times the risk (Relative Hazards = 3.90 [95% confidence interval: 2.14, 7.11]) of

death due to cardiovascular causes, compared with the low scorers on the hopelessness scale. These relationships remained significant after adjusting for biological, behavioral, and socioeconomic risk factors, including depression (Everson et al.). Among men with no known history of angina or MI ($n = 1820$), those reporting high levels of hopelessness were at significantly increased risk for a first-time MI ($n = 95$), relative to men scoring low on the measure of hopelessness (Relative Hazards = 2.39 [95% confidence interval: 1.35, 4.25]) (Everson et al.).

Finally, hopelessness was found to be a strong predictor of survival (345 deaths in a sample of 921) in patients with significant CHD hospitalized at Duke University Medical Center, with an adjusted relative risk of 1.5 ($p = 0.015$), independent of depression (Barefoot et al., 2000). However, no studies were found that examined the frequency and severity of hopelessness after hospitalization for MI.

Although hopelessness after a MI has not been previously examined, the psychological dynamics in response to other potentially life-threatening diseases may be similar to that of a MI. In particular, individuals diagnosed with cancer or AIDS are especially vulnerable to emotional distress. Symptoms of hopelessness have been identified in 40% of men with cancer and AIDS, with higher levels of hopelessness symptoms associated with poorer functional status (VanServellen et al., 1996). Higher levels of hopelessness symptoms have also been associated with increased risk for relapse or death in women with breast cancer (Watson et al., 1999) and have been identified as a predictor of suicidal ideation or desire for death in individuals with terminal cancer (Breitbart et al., 2000; Cochinov et al., 1998). The frequency of hopelessness after a MI,

and impact of hopelessness on post-MI outcomes, may be similar to those seen in individuals with cancer and AIDS.

Exercise Participation

Cardiac rehabilitation exercise is an outcome of interest in the CHD population. Evidence suggests that participation in a cardiac rehabilitation exercise program promotes improved exercise tolerance (Balady, Jette, Scheer, & Downing, 1996; Marchionni et al., 2003) and a reduction in mortality in individuals with CHD (Balady et al., 2000). Despite the potential benefits, studies over the past decade indicate that only 11% to 21% of patients participate in an outpatient cardiac rehabilitation exercise program after a CHD event (Ades, Waldmann, McCann, & Weaver, 1992; Blackburn et al., 2000).

Patient factors predictive of decreased participation in an outpatient cardiac rehabilitation program include increased age (Ades et al., 1992; Blackburn et al., 2000), female gender (Ades et al., Blackburn et al.), lower education (Ades et al.), and decreased left ventricular function (Blackburn et al.). Research has found increased depression (Glazer et al., 2002; Ziegelstein, et al., 2000) and a history of depression (Ades et al.) as another predictor of decreased exercise participation. A reciprocal relationship is evident in that depression has also been found significantly reduced in CHD patients participating in a structured outpatient cardiac rehabilitation exercise program as compared to those who did not participate (Blumenthal et al., 1997; Milani & Lavie, 1998). Health care provider and health care system factors predictive of decreased participation in cardiac rehabilitation exercise include the strength of the physician's recommendation and the patient's commute time (Ades et al.; Barber, Stommel, Kroll, Holmes-Rovner, & McIntosh, 2001). Moreover, of those who participate in an outpatient cardiac

rehabilitation exercise program, 25% to 50% discontinue within six months and less than 25% continue exercise at home (Harlan, Sandler, Lee, Lam, & Mark, 1995). Little research has been done which examines home-based cardiac rehabilitation exercise. Findings suggest that depression symptoms are negatively related to participation in home exercise (Ziegelstein et al.).

No research was found examining the relationship between hopelessness symptoms and participation in cardiac rehabilitation exercise. However, attitude and perceived behavioral control have been found to explain a proportion of variance in exercise intention and subsequent adherence in a sample of patients attending a structured outpatient cardiac rehabilitation program (Blanchard et al., 2003) and in a sample of 30 to 60 year old men in the community (Nguyen, Potvin, & Otis, 1997). Hopeless individuals have a negative attitude toward the future and perceive little control in changing the future (Abramson et al., 1989). A post-MI patient suffering from hopelessness may not be able to identify a purpose in exercising. Consequently, a hopeless post-MI patient may have little intent on starting an exercise program or may have poor adherence to a program once it is started.

Physical Functioning

Physical functioning is another outcome of interest in the CHD population. Decreased physical functioning in patients with CHD has been associated with female gender, increased age, decreased aerobic exercise capacity, decreased leg and arm strength, and increased comorbidity (Ades et al, 1999). Increased depression symptoms have also been negatively related to physical functioning in CHD patients beginning an outpatient cardiac rehabilitation exercise program (Blumenthal et al., 1997). These same

patients were evaluated after three months of exercise and a decrease in depression symptoms was correlated with improvement in physical functioning (Ades et al.). Moreover, baseline depression scores accounted for approximately 10% of the variance associated with decreased aerobic capacity in a sample of patients attending a structured outpatient cardiac rehabilitation exercise program, controlling for demographic variables and adherence (Glazer et al., 2002). Because hopelessness symptoms have been associated with poorer functional status in men with cancer and AIDS (VanServellen et al., 1996), hopelessness symptoms may be correlated with physical functioning post-MI. However, no research was found examining the relationship between hopelessness symptoms and physical functioning in a CHD population.

Chapter Summary

The purpose of this investigation was to describe the symptoms of hopelessness and depression following a MI, the relationship between hopelessness and depression symptoms, patient characteristics leading to these two constructs, and the effect of hopelessness symptoms on cardiac rehabilitation exercise participation and physical functioning post-MI. The conceptual model of the proposed study, developed from a review of the psychology, nursing, and medical literature, will be presented in Chapter 2. Chapter 3 focuses on the present state of hopelessness research and the significance of the current study. The design, key variables, measures, procedures, protection of human subjects, and an overview of data analysis will be presented in Chapter 4. Chapter 5 will present the results of the study. Chapter 6 will provide a discussion, including limitations of the study and implications for nursing research and practice.

Chapter 2

CONCEPTUAL FRAMEWORK

The complex relationship between coronary heart disease (CHD) and one's psychological status is not fully understood. The prevalence, severity, and impact of depression after a MI have been well documented. However, the relationship between hopelessness and depression is not well understood and the frequency, severity and impact of hopelessness after a MI have not been previously examined. The purpose of this chapter is to present a conceptual model for the study that describes the relationships among hopelessness, depression, and select patient outcomes after a MI. A review of literature that provided the foundation for the development of the conceptual model will first be discussed with a focus on the relationship between hopelessness and depression and the distinction between these two concepts. Next, the conceptual model and the relationships among its concepts as reported in the psychology, nursing, and medical literature will be presented. This chapter will conclude with a summary of how the conceptual relationships apply to hopelessness and depression after a MI.

The Literature Review for the Conceptual Model

A review of the literature was completed to identify relationships among hopelessness, depression, and select patient outcomes (i.e. cardiac rehabilitation exercise participation and physical functioning) after a MI. The Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, and PsychINFO® databases were searched (1983-2005) using the key words and terms 'hopelessness,' 'hopelessness and heart disease,' 'hopelessness and depression,' 'depression and heart disease,' 'exercise and heart disease,' 'physical functioning and heart disease,' 'recovery and heart disease,'

and ‘rehabilitation and heart disease.’ The purpose of this literature review was to identify works that focused on the concepts of hopelessness, depression, CHD, and outcomes of CHD. Literature was reviewed over a twenty-year period to understand the historical development of the concepts; however, particular attention was given to published works within the past five years. Conceptual, theoretical, and empirical writings were reviewed to discern the applicable concepts and potential relationships present with hopelessness and depression after a MI. Secondary articles were reviewed to identify primary theoretical and conceptual sources; however, only primary sources were cited. The literature searches produced works by authors in the disciplines of psychology, nursing, and medicine. Because the greatest breadth and depth of the conceptual and theoretical literature related to hopelessness was found in the psychology literature, and some of the work in psychology differs from the work in nursing and medicine, the works of each of the three disciplines are discussed separately in this chapter.

Hopelessness in the Literature

The concept of hopelessness is used in a variety of ways by both lay people and healthcare professionals. The word hopeless in lay Western society often refers to a negative situation that is futile or has no hope, such as a terminal illness, addiction, or poor marital relationship. This use of the word hopeless focuses on a negative outcome and a sense of helplessness. In contrast, another common use of the term hopeless in Western society is the phrase “hopeless romantic,” referring to people who are incurable of their romantic tendencies. This phrase focuses on helplessness; however, does not necessarily refer to expectations of a negative outcome. The *Merriam-Webster Collegiate Dictionary* (2003) identifies hopelessness as the noun associated with the adjective

hopeless. Hopeless is defined as having no expectation of good or success (despairing); not susceptible to remedy or cure; incapable of redemption or improvement; giving no ground for hope (desperate); and incapable of solution, management, or accomplishment (impossible). A synonym offered in the dictionary's definition is "impossible" (Merriam-Webster's Collegiate Dictionary). This definition focuses on a negative affect and helplessness.

The psychology literature. Hopelessness is used by the discipline of psychology in differing ways. Hopelessness has been defined by the American Psychiatric Association (APA) as a pervasive pessimism about the future (2000). Hopelessness is used as a symptom of several depressive disorders in the APA's *Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR)*; however, the *DSM IV-TR* does not classify hopelessness as a unique category for therapy.

In contrast, many psychology researchers use hopelessness as a distinct concept. Beck's cognitive perspective states that hopelessness results from irrational and distorted thoughts (1967). Beck further describes hopelessness as a system of negative expectancies concerning one's self and one's future life (Beck, 1967). Beck and colleagues describe negative outcome and helplessness expectancies with three dimensions (Beck, Weissman, Lester, & Trexler, 1974). The cognitive dimension is comprised of negative future expectations, such as thoughts that include a dark, vague, or uncertain future. The affective dimension consists of negative feelings about the future, including lack of hope, enthusiasm, or faith. The motivational dimension includes negative thoughts and feelings toward changing the future (Beck et al., 1974), such as not being able to make things better.

Another psychological perspective, titled the Theory of Hopelessness Depression, defines hopelessness as both a negative outcome expectancy and a helplessness expectancy (Abramson et al., 1989). Abramson and colleagues use hopelessness as a distinct concept in examining hopelessness as a precursor to a subtype of depression, called hopelessness depression. Abramson and colleagues note a sequence of causal events that lead to distorted thoughts and hopelessness. This sequence begins with the perception of a life event as negative and an expectation that one can do nothing to change the event or its consequences. Individuals make inferences at this point, which contribute to whether they become hopeless. Inferences include (a) cause, (b) consequences, and (c) characteristics about oneself. Hopelessness is more likely to occur if a person has a negative cognitive style where the person makes negative inferences regarding the causes and consequences of life events and their ability to change the event (Abramson et al.).

According to both Abramson et al. (1989) and Beck (1967), hopelessness can be generalized (i.e. a trait) or circumscribed (i.e. a state). Individuals with trait hopelessness exhibit chronic negative outcome expectancy about many areas of their life. Individuals with state hopelessness exhibit negative outcome expectancy about a limited area or event in their life (Abramson et al.), such as an unexpected crisis or acute illness. The severity of hopelessness in a person at any point in time may be explained by both stable individual differences (i.e. trait) and varying individual differences (i.e. state) (Abramson et al.; Beck). However, an individual with trait hopelessness may be more susceptible to state hopelessness than an individual without a pre-existing hopelessness trait (Abramson et al.). Abramson and colleagues suggest that trait hopelessness may produce more

severe symptoms than the symptoms caused by state hopelessness, and that trait hopelessness symptoms will likely require long-term cognitive therapy. State hopelessness is more likely to produce less severe symptoms of a temporary nature and may be successfully treated with short-term cognitive interventions. Despite the conceptual differentiation of trait versus state hopelessness, there has been no distinction in operationalizing the two types of hopelessness in the literature.

In summary, hopelessness as a concept is used by the discipline of psychology in a variety of ways. Some psychologists use hopelessness as a symptom of depressive disorders (APA, 2000) while others in the field of psychology view hopelessness as a distinct concept (Abramson et al., 1989; Beck et al., 1974) that may or may not serve as a precursor to a subtype of depression (Abramson et al.). Finally, some psychologists describe the intensity of hopelessness in a given person at a given point in time as having either trait or state characteristics or a combination of trait and state hopelessness characteristics (Abramson et al.; Beck, 1967). Although measures to distinguish trait and state hopelessness do not currently exist, the severity of hopelessness can be assessed and treated accordingly with long-term or short-term cognitive interventions.

The nursing literature. The concept of hopelessness is not as well described in the nursing literature as in the psychology literature. Nurses who use the North American Nursing Diagnosis Association (NANDA) (1996) nursing process and documentation systems use hopelessness as a nursing diagnosis in their practice. Despite the fact that hopelessness is used as a nursing diagnosis, definitions of hopelessness vary in the nursing literature. NANDA defines hopelessness as “a subjective state in which a person sees limited or no alternatives or personal choices available and is unable to mobilize

energy on his/her behalf” (NANDA, 1996, p. 69). This definition, similar to that of Abramson et al. (1989), focuses on helplessness expectancy; however, it does not address expectations of a negative outcome. Defining characteristics of the NANDA hopelessness diagnosis include passivity, decreased verbalization, decreased affect and verbal cues such as despondent content, sighing or saying, “I can’t.” Minor defining characteristics include lack of initiative, decreased response to stimuli, turning away or shrugging, closing eyes, decreased appetite, increased or decreased sleep, and lack of involvement in care (NANDA). Although verbal cues have been found to be a critical component of the NANDA hopelessness diagnosis (Bruss, 1988), several of the remaining characteristics are considered in psychology literature to be symptoms of depression, including decreased affect, lack of initiative, decreased appetite, and increased or decreased sleep (APA, 2000).

Hopelessness has been defined by one group of nurse researchers as “...a feeling of despair and discouragement; a thought process that expects nothing, and a behavioral process in which the person attempts little or takes inappropriate action” (Farran, Herth, & Popovich, 1995, p. 25). Farran and colleagues describe hopelessness as a state or trait and as a trajectory with four attributes: (a) experiential (i.e. discouragement and despair, loss of energy, perceived lack of resources, feeling entrapped, or the expectation that desired outcomes will not occur); (b) relational (i.e. absence of relationships with others who can help, disbelief/lack of expectation that others can help, inability to trust others, or social withdrawal); (c) transcendent (i.e. disbelief in a spiritual power, inability to perceive transcendent help, or over-reliance in a spiritual power); and (d) behavioral (i.e. difficulty thinking, realizing alternatives, or setting goals, or ineffective action) (Farran et

al.). The description of hopelessness by Farran et al., based on a literature review and the researchers' own experiences and research, is similar to that of NANDA (1996) and Abramson et al. (1989) in emphasizing a helplessness expectancy and similar to Abramson et al. by incorporating a negative outcome expectancy. However, several characteristics identified by Farran et al. are recognized by the APA (2000) as depression symptoms, including discouragement, despair, loss of energy, social withdrawal, and impaired thinking.

A limited number of concept analyses in nursing have addressed hopelessness attributes. Campbell's (1987) analysis defined four hopelessness attributes, namely negative future expectations, loss of control over the future, passive acceptance of the futility in planning goals, and emotional negativism. An analysis of hopelessness, helplessness, and powerlessness by Drew (1990) concluded that the three concepts are qualitatively different in nature and that hopelessness is primarily a trait. A grounded theory study by Kylmä, Vehviläinen-Julkunen, and Lähdevirta (2001) defined hopelessness as passivity and a giving up in the face of belief in a non-existing future. Although the analyses by Campbell, Drew and Kylmä et al. addressed negative and helplessness expectancies, they did not strive to differentiate hopelessness from depression. In contrast, Bartlett sought to examine hopelessness and depression using the Hybrid Model of Concept Development (1994) and descriptive research (1999). Bartlett concluded that the differentiation of hopelessness from depression was impossible and that hopelessness should not be considered a NANDA diagnosis (1999). However, Bartlett's findings were limited by the concept analysis strategy used, small sample size, and restricted use of correlational analysis.

Nursing literature further supports a negative life event as an antecedent to hopelessness. NANDA describes a perceived or actual stressor or loss for an individual as an antecedent of hopelessness, including a prolonged activity restriction creating isolation, a failing physiological condition, long-term stress, abandonment, or a loss of belief in transcendent values/God (1996). Similarly, Farran et al. (1995) identified negative intrapersonal, interpersonal, and environmental/sociological experiences as antecedents, Drew (1990) described stress as an antecedent, and Campbell (1987) identified a negatively perceived event or a series of failures to reach a desired goal as antecedents to hopelessness. The nursing literature does not support distorted thoughts as an antecedent to hopelessness in the physically ill. This may be due to the fact that when physically ill individuals judge their illness as negative and out of their control, it is often an accurate appraisal.

Although it is commendable that the nursing discipline has recognized hopelessness as an important concept by identifying it as a NANDA (1996) nursing diagnosis, it is apparent that definitions of hopelessness in the nursing literature differ from one another and differ from definitions provided in the psychology literature. The definition by NANDA lacks the key characteristic of a negative outcome expectancy. The NANDA definition and definition by Farran et al. (1995) also contain characteristics considered by psychologists as symptoms of depression. An accurate, consistent definition of the concept of hopelessness is needed in nursing to adequately assess its presence in individuals and to intervene appropriately.

The medical literature. Although hopelessness is not typically used as a concept or category for diagnosis or therapy in medicine, hopelessness has been gaining attention

over the past decade as a variable in selected medical studies. Hopelessness was defined in one of these medical studies as a feeling of sadness and discouragement, the presence of excess problems, and questioning if anything is worthwhile (Anda et al., 1993).

Another medical study described hopelessness as the feeling of impossibility in reaching goals and a disbelief that things will change for the better (Everson et al., 1996; Everson et al., 2000). While several of the characteristics described in these medical studies are hopelessness attributes, feelings of discouragement and sadness are considered by APA (2000) as depression symptoms. As in nursing, an accurate and consistent definition of hopelessness is needed in medicine to identify its presence in individuals and to treat individuals accordingly.

In summary, hopelessness as a concept is defined by several disciplines, namely psychology, nursing, and medicine. Overall, psychology, nursing and medicine agree that hopelessness consists of negative expectations concerning one's future and negative thoughts toward changing one's outcomes in the future. Symptoms of hopelessness as described by psychology, nursing, and medicine include thoughts of a negative, vague or uncertain future; lack of hope, enthusiasm or faith; an expectation of limited choices; an expectation of not being able to make things better; and verbal cues such as "I can't." Because hopelessness is conceptualized as a distinct concept in some of the literature, as a symptom of depression in other literature, and as a cause of depression in yet other writings, a review of depression in the literature is also needed.

Depression in the Literature

The concept of depression is used in the literature to refer to a range of mood disorders that can be diagnosed using standardized criteria. Depression may be used to

describe any disorder ranging from a sad mood, psychological distress related to a negative mood state, major depression, or a biochemical disorder (APA, 2000).

Depression is diagnosed using the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)* (APA). Major depression is defined by the APA as the presence of depressed mood and/or loss of interest or pleasure in activities most days over two weeks in addition to the presence of four of the following: weight loss or gain, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness, hopelessness, or guilt, decreased ability to think or indecisiveness, or recurrent thoughts of death or suicidal ideation or attempts.

The heterogeneous components of depression are further described in the literature with respect to both symptoms and cause. Symptoms of depression have been described using sub-concepts/sub-scales or factors of depression. Factor analytic studies using the Center for Epidemiologic Studies- Depression Scale (CES-D) have validated a four-factor structure of depression (Radloff, 1977; Sheehan, Fifielf, Reisine & Tennen, 1995), namely (1) depressed affect/mood (blues, depressed, lonely, cry, sad), (2) lack of well-being/positive affect (good, hopeful, happy, enjoy), (3) somatic and retarded activity (bothered, appetite, effort, sleep, get going), and (4) interpersonal (unfriendly, dislike).

Etiology of depression has also figured prominently in the definitions of a subtype of depression, titled hopelessness depression. A causal chain of hopelessness depression begins with a life event that is perceived as negative. This is followed by inferences about the cause, consequences, and self. These inferences will most likely lead to hopelessness when the person believes that the negative consequence is important, unlikely to change, and affects many areas of life. It has been hypothesized that hopelessness, if left

untreated, can lead to hopelessness depression (Abramson et al., 1989). Because hopelessness as a concept is present in the APA (2000) definition of depression, and because it is hypothesized that there is a causal relationship between hopelessness and depression, further distinction of hopelessness from depression is warranted.

Distinction of Hopelessness from Depression

There are areas of agreement and disagreement in the literature regarding the distinct attributes of hopelessness and depression and the relationship between the two concepts. Ambiguity related to the distinct characteristics of hopelessness and depression may be attributed in part to similar characteristics found in the two conditions. The psychomotor retardation, lack of voluntary responses, loss of energy, and fatigue or sleep disturbances seen in people with depression (APA, 2000) can resemble the helplessness expectancy seen in hopelessness. The depressed mood, sadness, apathy, loss of interest in activities, indecisiveness, or suicidal thoughts seen with depression (APA) can be similar to the negative expectancy evident in hopelessness.

Further uncertainty regarding the relationship between the two concepts may be due to different perspectives of the two entities. According to the APA, depression can range from a temporary grief response to a persistent psychiatric disorder and includes the presence of depressed mood and/or loss of interest or pleasure in activities, in addition to several other potential symptoms including hopelessness. This conceptualization of hopelessness as a symptom of depression supports Beck's theory of depression (1967). In contrast, Abramson et al. (1989) have conceptualized hopelessness as a precursor to a subtype of depression (i.e. hopelessness depression), not as a symptom

of depression. Abramson et al. recognize that hopelessness, beginning as a precursor, may continue at times in conjunction with this subtype of depression.

In examining hopelessness and depression in response to physical illness, the distinction of each concept and their relationship to each other may be best viewed on a continuum (Dunn, 2005). Depression often occurs as a grief response to a past event, such as a physical illness, and includes distinct attributes or symptoms. In contrast, hopelessness is focused on expectations about the future. Hopelessness occurs in response to a negative event, such as a physical illness, and includes specific symptoms. The continuum of the relationship between hopelessness and hopelessness depression attributes is depicted in Figure 1. According to Figure 1, hopelessness and depression can be distinct diagnoses or hopelessness can lead to hopelessness depression.

In summary, hopelessness and depression are closely related concepts. The negative outcome and helplessness expectancies seen in hopelessness may resemble the depressed affect/mood and retarded activity seen in depression. Hopelessness may further lead to a subtype of depression. Because the two concepts are closely related, it is imperative to examine the frequency and severity of each concept, the relationship between the two concepts, and to further identify their antecedents and consequences.

Antecedent Factors in the Literature

Patient demographics and patient history have been examined as potential antecedent factors for depression, hopelessness, cardiac rehabilitation exercise, and physical functioning. Depression has been found more common in CHD patients who are of female gender (Anda et al., 1993; Barefoot et al., 2000; Mendes de Leon et al., 2001; Travella et al., 1994; Watkins et al., 2003), decreased age (Barefoot et al.; Watkins et al.),

PAST ← ----- → FUTURE

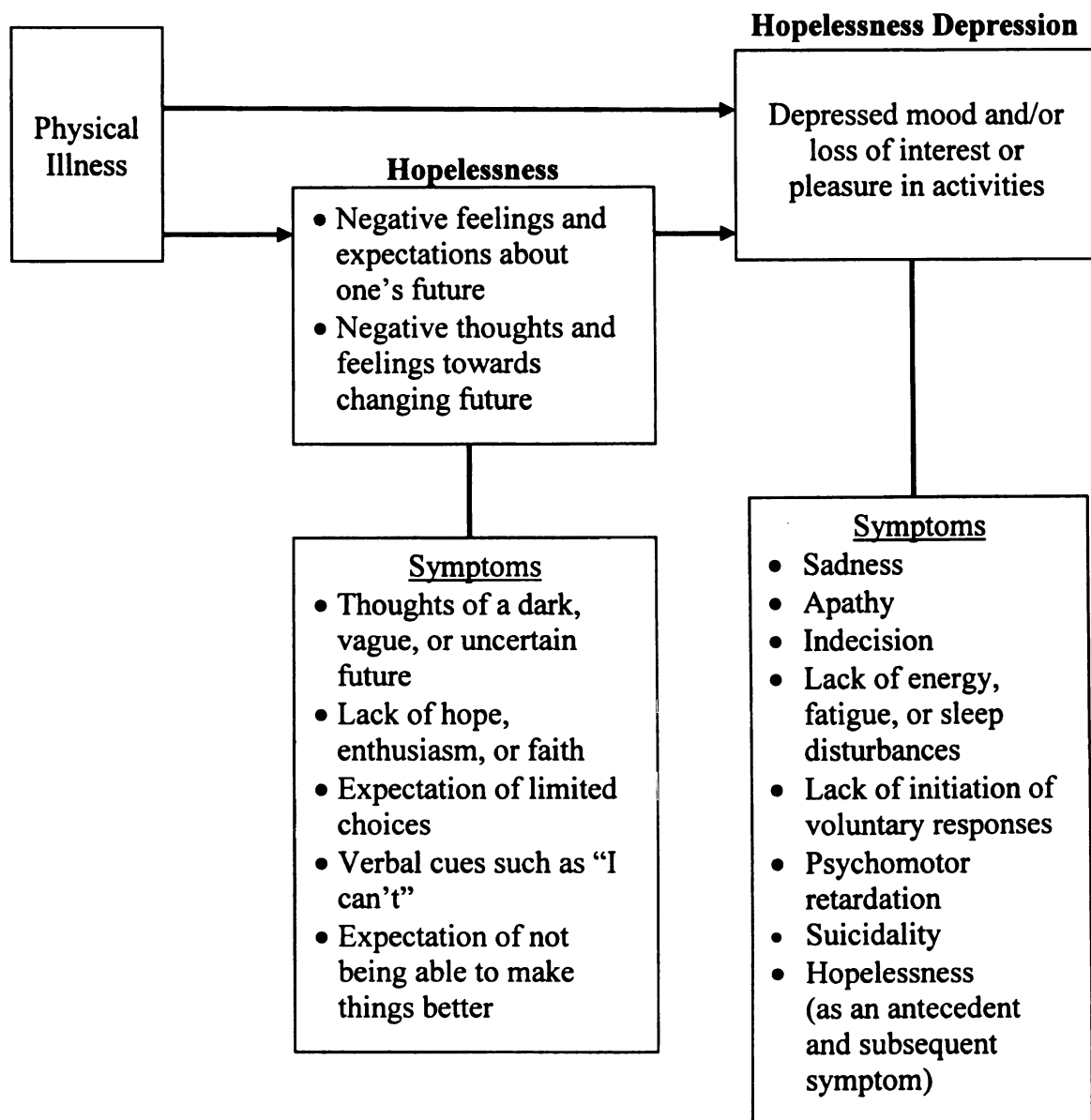


Figure 1. Continuum of Hopelessness and Hopelessness Depression

non-married status (Anda et al.) or socially isolated (Watkins et al.), less educated (Watkins et al.), with decreased income (Barefoot et al.), and with a history of depression (Lesperance et al., 1996). Both non-Caucasian race (Anda et al.) and Caucasian race (Watkins et al.) have been associated with depression in CHD patients. One study that examined potential antecedent variables to hopelessness and depression found no demographic variables as antecedents to hopelessness (Barefoot et al.).

Decreased participation in outpatient cardiac rehabilitation exercise has been associated with increased age (Ades et al, 1992; Blackburn et al., 2000), female gender (Ades et al., Blackburn et al.), lower education (Ades et al.), decreased left ventricular function (Blackburn et al.), and history of depression (Ades et al.). Decreased physical functioning in patients with CHD has been associated with female gender, increased age, decreased aerobic exercise capacity, decreased leg and arm strength, and increased comorbidities (Ades et al, 1999).

Exercise Participation in the Literature

Participation in cardiac rehabilitation exercise is defined in a variety of ways in the literature. Some authors have focused on adherence to recommended exercise by measuring self-reported regular exercise (Ziegelstein et al., 2000). Other authors have defined participation in cardiac rehabilitation exercise as adherence to the number or percentage of exercise appointments kept while the patient was enrolled in an outpatient cardiac rehabilitation exercise program (Glazer et al., 2002; Hershberger, Robertson & Markert, 1999). Still others have defined participation as adherence by measuring the percentage of outpatient exercise sessions attended divided by the number of exercise sessions prescribed (Blanchard et al., 2003) or the actual exercise behaviors divided by

the individual's exercise intention (Konradi & Lyon, 2000). Others have defined cardiac rehabilitation exercise participation as the frequency of supervised on-site exercise plus the frequency of off-site independent exercise of 30 minutes or more per session (Carlson, Johnson, Franklin & Vanderlaan, 2000).

Although hopelessness post-MI has not been previously examined, hopelessness may have a negative effect on cardiac rehabilitation exercise participation. Hopeless individuals have negative and helplessness expectancies about changing future outcomes (Abramson et al., 1989). Thus, individuals with hopelessness may not be able to identify a purpose in participating in exercise if they believe that the exercise will not make a difference in their outcome.

Physical Functioning in the Literature

Physical functioning is defined and measured in a variety of ways. Some researchers define and measure physical functioning as strictly the self-reported functional performance during a range of activities from low (i.e. dressing) to strenuous (i.e. running) levels (Ades et al., 1999; Barnason, Zimmerman, Anderson, Mohr-Burt & Nieveen, 2000). Rejeski and colleagues (2002) measured physical functioning with both functional performance and functional capacity measures, namely the peak or average metabolic equivalency (MET) level during activity or exercise, the total distance covered in feet during a treadmill test, and with a self-reported physical functioning measure. Other researchers integrate elements of both functional performance and functional capacity in one's self-reported ability to perform various activities ranging from activities of daily living to strenuous exercise, with the conversion of these to MET levels

(Bailey-Merz et al., 2000; Hlatky et al., 1989; Rankin, 2002; Yates, Price-Fowlkes & Agrawal, 2003).

Hopelessness has not been examined in relationship to physical functioning post-MI; however, it may potentially negatively affect physical functioning. A hopeless individual has negative and helplessness expectancies about changing future outcomes (Abramson et al., 1989). Thus, a hopeless individual may not feel capable of physically functioning and may believe that it will not make any difference in their outcome.

In summary, a review of literature was completed focusing on the concepts of hopelessness, depression, cardiac rehabilitation exercise participation, and physical functioning. Hopelessness is defined in the literature as a negative expectation concerning one's future and an expectation of helplessness in changing one's future outcomes. Depression, as a closely related concept, is defined in the literature as an affective or mood disorder. By definition, hopelessness may lead to a subtype of depression. Participation with cardiac rehabilitation exercise is defined in the literature as the number or percentage of exercise appointments kept while the patient is enrolled in an outpatient cardiac rehabilitation exercise program or independent home exercise program, sometimes in relationship to a prescription for exercise. Physical functioning is identified and defined in the literature as either functional performance or capacity during a range of activities.

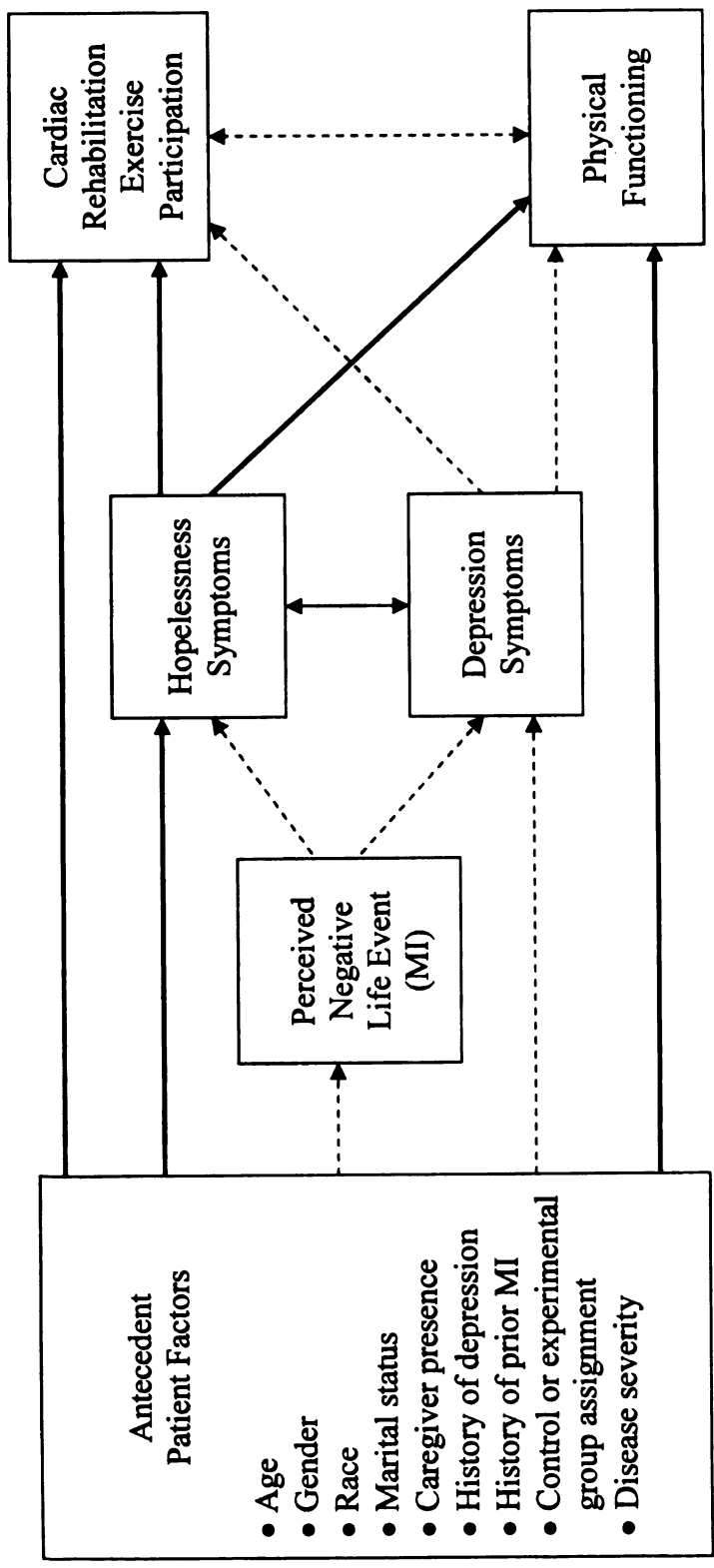
Because hopelessness has not been previously examined in the post-MI recovery period, a conceptual model is needed to illustrate the concepts of interest and their relationships. The conceptual definitions for the proposed study will also be discussed in the conceptual model section of this chapter.

The Conceptual Model

The conceptual model of the study is presented in Figure 2. This model is based on Abramson's Theory of Hopelessness Depression (Abramson et al., 1989). The study focuses on selected relationships depicted in the model. Specifically, the relationships portrayed by solid arrows were examined, while relationships portrayed by broken arrows were not a focus in the study (a separate analytic model will be discussed in Chapter 4).

The conceptual model presents the relationships among antecedent patient factors, the perceived negative life event (MI), hopelessness symptoms, depression symptoms, participation in cardiac rehabilitation exercise, and physical functioning. Although each of these concepts was discussed in the preceding literature review section of this chapter, the following section is presented to theoretically define each of the concepts and their role in the conceptual model.

Antecedent patient factors. Antecedent patient factors are defined in the study as those variables that are potential precursors to the negatively perceived MI event, to symptoms of hopelessness and depression, and to physical functioning and cardiac rehabilitation exercise participation. The relationship between the antecedent patient factors and the negative life event (i.e. MI) was not a focus of this study and was not examined. However, antecedent patient factors were used in the study to describe the sample, in the prediction of hopelessness symptoms, and as control variables in predicting cardiac rehabilitation exercise participation and physical functioning. Antecedent patient factors of interest include age, gender, race, marital status, presence of caregiver, history of depression, history of prior MI, assignment to control or



Note. Dashed lines represent relationships that were not a focus in the study.

Figure 2. Conceptual Model of the Study

experimental group in the larger study from which this sample was taken (see further discussion pages 29-30), and disease severity.

Participants in the study were male and female adults age 21 years and older. Race was differentiated by self-report as falling into the following groups: Caucasian, Hispanic or Latino, American Indian/Alaska Native, Asian, Native Hawaiian or other Pacific Islander, Black or African American, more than one race, or unknown or not reported. Marital status was differentiated as married, separated, divorced, widowed, and never married. The presence of a caregiver was defined in the study as the presence or absence of someone who could help the patient with any type of care after being in the hospital. The caregiver could be formal (e.g. a nurse or nurse's aide) or informal (e.g. a family member). History of depression was defined for the study as a self-report as to whether the person had ever been diagnosed or treated for depression. A history of MI was defined as a self-report as to whether the person had ever been diagnosed or treated for a heart attack prior to the current hospitalization and current MI.

The sample for this study came from the AHRQ-funded project (HS10531), entitled, "Patient Decision Support and Coaching Project", referred hereafter as the Heart After Hospital Recovery Planner (HARP) study. Participants in the HARP study were randomized to a control or experimental group. Those in the experimental group received a six-session program delivered over the telephone by a trained health educator. The HARP study intervention adapted a relapse prevention model smoking cessation program for use with the multiple risk factors of CHD, including smoking, physical activity, diet, stress, and compliance with medications. Those in the control group received standard care.

Disease severity, defined in the study as left ventricular ejection fraction post-MI while the patient was still hospitalized, is recognized in the conceptual model as an antecedent to a perception of the MI as a negative life event. It was hypothesized in the study that patient understanding of a decreased ejection fraction, or self-reported symptoms resulting from a decreased ejection fraction, could be related to a patient's negative perception of a MI event. The effect of decreased ejection fraction on a patient's negative perception of a MI could thus potentially affect hopelessness symptoms. It was also recognized that severity of disease may be directly related to physical functioning and cardiac rehabilitation exercise participation. Subjects in the HARP study may have received any form of medical or surgical treatment, including coronary artery bypass surgery or angioplasty; however, ejection fraction was used for the measurement of disease severity.

Hopelessness. Hopelessness was defined for the study as a negative expectancy concerning one's future, including expectations of helplessness in changing one's future (Abramson et al., 1989). Hopelessness was defined for the study as either a state or trait; however, data related to hopelessness symptoms prior to the MI were not available and therefore state and trait hopelessness could not be differentiated in this study. Symptoms of hopelessness include: thoughts of a dark, vague or uncertain future; lack of hope, enthusiasm, or faith; expectations of limited choices; expectations of not being able to make things better; and cues such as "I can't".

Hopelessness can be prompted by a life event, such as a MI, which the individual attributes as negative (Abramson et al., 1989). Hopelessness is more likely to occur if a person believes that the negative consequence is important, unlikely to change, and

affects many important areas of one's life (Abramson et al.). People who exhibit a negative cognitive style are more likely to make negative inferences (Abramson et al.). For example, a person diagnosed with an acute MI would likely perceive this as a negative event. If the person believed that they were leading a fairly healthy lifestyle prior to the event, the person might infer that he or she has little control over the cause. If family members have historically died due to MI, the person may infer that the MI is not preventable or that death is imminent. If the individual is a smoker who has failed at attempts to quit the habit, the person may infer that he or she will be unsuccessful at smoking cessation.

It was recognized in the study that antecedent patient factors may serve as predictors of hopelessness and this was examined. It was also recognized that hopelessness and depression symptoms are likely related to each other and the strength of this potential relationship, as well as the independence of these two variables in relationship to other predictors and outcomes were examined. However, based on the work of Abramson and her colleagues (1989) it was hypothesized in the study that hopelessness symptoms can be independent of depression symptoms or be a precursor of depression symptoms. Hopelessness symptoms were thus examined as predictive of depression symptoms. Hopelessness symptoms were also used as a predictor of cardiac rehabilitation exercise participation and physical functioning, controlling for depression symptoms.

Depression. The conceptual model recognizes that increased depression symptoms can be related to a MI event, as described in the earlier literature review. The definition of depression for the proposed study is the presence of depressed mood and/or

loss of interest or pleasure in activities most days over two weeks in addition to the presence of four of the following: weight loss or gain, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness, hopelessness, or guilt, decreased ability to think or indecisiveness, or recurrent thoughts of death or suicidal ideation or attempts (APA, 2000). It is recognized that one component of depression may be a subtype of depression titled hopelessness depression (see Chapter 3 for further elaboration of hopelessness depression); however, hopelessness depression could not be specifically examined in this study. Instead, in examining the relationship between hopelessness and depression, hopelessness was examined as a predictor of depression. It is also recognized that antecedent patient factors may be predictive of depression symptoms, although this was not a focus in this study. Depression symptoms potentially have an affect on cardiac rehabilitation exercise participation and physical functioning. Level of depression symptoms was used as a control variable in this study in predicting cardiac rehabilitation exercise participation and physical functioning.

Cardiac rehabilitation exercise participation. Participation in cardiac rehabilitation exercise was defined in the study as self-reported participation in a hospital- and/or home-based cardiac rehabilitation exercise program. Exercise participation was used as an outcome variable. It was hypothesized in the study that a higher level of hopelessness symptoms would be predictive of a lower level of cardiac rehabilitation exercise participation. Although it is recognized in the conceptual model that symptoms of depression can directly affect cardiac rehabilitation exercise participation, this was not a focus in the study. It is recognized in the model that physical

functioning can affect cardiac rehabilitation exercise participation in that someone with decreased physical functioning may be less capable of participating in cardiac rehabilitation exercise. It is also recognized that cardiac rehabilitation exercise participation may have an effect on physical functioning in that someone with decreased participation in exercise may have decreased physical capability. However, the bi-directional relationship between physical functioning and cardiac rehabilitation exercise participation was not a focus in this study.

Physical functioning. Physical functioning was defined in the study as one's self-reported ability to perform various activities ranging from activities of daily living to strenuous exercise. It was used as an outcome in the study. It was hypothesized in the study that a high level of hopelessness symptoms would be predictive of a lower level of physical functioning. The model also recognizes that symptoms of depression can directly affect physical functioning, although this was not a focus of the study.

Model Application to Hopelessness and Depression after a MI

The psychological status of a person in the post-MI recovery period is complex and not well understood. The examination of the conceptual relationships in this study was intended to increase this understanding. The antecedent patient factors were examined to help identify sub-groups of individuals who are at risk for hopelessness symptoms post-MI. An analysis of the relationship between hopelessness and depression symptoms was completed to help clarify the distinction between these two closely-related concepts. Finally, the examination of hopelessness symptoms as a predictor of cardiac rehabilitation exercise participation and physical functioning was completed to

potentially offer new information as to the role of hopelessness in affecting patient outcomes post-MI.

Chapter Summary

The purpose of the study, research questions, and conceptual framework have been presented in Chapters 1 and 2. Chapter 3 will describe in greater detail the current state of hopelessness research with the CHD population and will focus on gaps in the literature. Chapter 4 will discuss the specific design and methodology of the study, while Chapter 5 and 6 will present the results and discussion.

Chapter 3

THE STATE OF HOPELESSNESS RESEARCH

Over the past several decades hopelessness research has focused on providing a better understanding of populations with mental illness, especially as related to depression, suicidal ideation, and suicide. More recently, hopelessness research has contributed to an increased understanding of the connection between emotional status and physical illness. However, there are gaps in the hopelessness literature for physically ill population groups, including those individuals in the post-MI recovery period. In this chapter, a summary and critique of hopelessness research in psychology, nursing and medicine from the mid-1980s to the present will be discussed. First, research findings related to the frequency, severity and impact of hopelessness will be discussed. Next, methodological issues of existing hopelessness research will be presented. The chapter will conclude with a discussion regarding the avenues of hopelessness research yet to be explored and the potential significance of this study.

Frequency, Severity and Impact of Hopelessness

Psychology researchers have examined hopelessness in psychiatric inpatient and outpatient populations for several decades. Early research focused primarily on the relationships among hopelessness, depression, and suicidal ideation or ultimate suicide. Hopelessness has frequently been reported as a stronger correlate of suicidal ideation (Beck & Steer, 1993; Wetzel, Margulies, Davis & Karam, 1980) and eventual suicide (Beck, Brown, Berchick, Stewart & Steer, 1990; Beck, Steer, Kovacs & Garrison, 1985) than depression.

More recent studies in psychology have focused on the relationship between hopelessness and a subtype of depression, titled hopelessness depression. According to Abramson et al. (1989), hopelessness is more likely to occur if a person has a negative cognitive style where the person makes negative inferences regarding the causes and consequences of life events. Research examining college students has shown that an increased negative cognitive style is related to increased levels of hopelessness, which can serve as a precursor to a subtype of depression (Alloy et al., 1999). Several other studies have found that a negative cognitive style is more strongly correlated with symptoms of hopelessness depression than with symptoms of other types of depression (Alloy & Clements, 1998; Alloy, Just & Panzarella, 1997; Joiner, 2001; Joiner, et al., 2001).

There is limited research in nursing that has examined hopelessness as a distinct concept. These studies have examined the NANDA (1996) diagnosis of hopelessness and its defining characteristics. A content validity study examining the defining characteristics of hopelessness identified verbal cues as critical to the nursing diagnosis of hopelessness, but did not find passivity, decreased verbalization, or decreased affect as significant to the hopelessness nursing diagnosis (Bruss, 1988). A study by Wake, Fehring, and Fadden (1991) reported that nurses from various countries differed in their ratings of how well each defining characteristic of the NANDA diagnosis of hopelessness represented the concept. A grounded theory study by Kylmä and colleagues (2001) defined attributes of hopelessness as passivity and a giving up in the face of belief in a non-existing future. Finally, Bartlett's descriptive research (1999) concluded that the differentiation of hopelessness from depression was impossible and that hopelessness

should not be considered a NANDA diagnosis. However, Bartlett's findings were limited by a small sample size and the sole use of correlational analysis.

In recent years the breadth of hopelessness research in nursing and medicine has expanded to examining the outcomes of hopelessness in medically ill populations. Many of these studies have examined hopelessness as a correlate or predictor of morbidity and mortality. A number of these studies have focused on hopelessness as independent from depression. These studies are applicable to the current study in that the psychological dynamics in response to any life-threatening illness may be similar to that of a MI. In particular, individuals diagnosed with cancer or AIDS are at high risk for emotional distress. In one nursing study, symptoms of hopelessness were identified in 40% of men with cancer or AIDS, with higher levels of hopelessness associated with poorer functional status in these populations (VanServellen et al. 1996). In other nursing studies, higher levels of hopelessness symptoms were associated with higher distress levels in women undergoing breast biopsy (Northouse et al., 1995) and poorer adjustment to breast disease in women during the first year following diagnosis (Northouse et al., 2001).

Medical studies have found that higher levels of hopelessness symptoms are related to increased risk for relapse or death in women with breast cancer (Watson et al., 1999) and predictive of suicidal ideation in individuals with terminal cancer, independent of depression (Cochinov et al., 1998). In another prospective medical study of terminally ill cancer patients, hopelessness and depression were positively correlated to desires for hastened death, although hopelessness provided independent contributions and had no interaction effect with depression (Breitbart et al., 2000). Menon, Campbell, Ruskin, and

Hebel (2000) examined a group of elderly medically ill veterans and found that increased hopelessness was related to decreased desire for life-saving treatments, independent of depression. Finally, a study among stroke survivors found hopelessness related to long-term survival, independent of depression (Lewis et al., 2001). Although this hopelessness research has not focused on post-MI populations, it is assumed that the psychological response to a MI is similar to other life-threatening illnesses and that there is a potential relationship between hopelessness and post-MI health outcomes.

Of particular interest to the current research are a limited number of large medical studies within the past decade that have examined the relationship between hopelessness in conjunction with CHD in cohorts over time. In the National Health Examination Follow-Up Study, the risk of fatal and nonfatal CHD among initially healthy men and women was higher for those participants with moderate and severe levels of hopelessness (see detailed description in Chapter 2), with hopelessness more strongly related to morbidity and mortality than depression (Anda et al., 1993). In the Finnish Kuopio Ischemic Heart Disease study, risk of death due to cardiovascular causes was doubled among men with moderate hopelessness scores while cardiovascular mortality risks tripled among men who had high hopelessness scores (see description in Chapter 2), after adjusting for depression (Everson et al., 1996). In a third cohort study, hopelessness was found to be a strong predictor of survival in patients with significant CHD, independent of depression (see Chapter 2 description) (Barefoot et al., 2000). No research was found examining the frequency, severity, or impact of hopelessness after a MI.

The biopsychosocial relationship between hopelessness and CHD outcomes is not fully understood. However, hopelessness may be similar to depression in its pathogenesis

of CHD and related outcomes. Depression has been associated with higher serum cholesterol levels (Ledochowski, 2003), inflammatory risk markers (Miller, 2003), higher glucocorticoids (Musselman, 1998), and elevated serotonin levels (Whyte, 2001), all of which can potentially have vasoconstrictive or atherogenesis properties. In addition, depressed individuals are at greater risk for ventricular arrhythmias (Carney, 2003; Lauzon, 2003; Shiotani, 2002). Hence, depression symptoms have potential to influence post-MI outcomes. Whether hopelessness may also affect post-MI outcomes is currently unknown.

Hopelessness, Exercise Participation, and Physical Functioning

Health outcomes of particular interest in the post-MI population include participation in cardiac rehabilitation exercise and physical functioning. Participation in exercise leads to improved exercise tolerance (Balady et al., 1996; Marchionni et al., 2003) and a reduction in mortality in individuals with CHD (Balady et al., 2000). No research was found examining the relationship between hopelessness symptoms and cardiac rehabilitation exercise participation. Similarly, no research was found examining hopelessness in any disease condition in relationship to adherence to healthy lifestyle recommendations. However, attitude and perceived behavioral control have been found to explain a proportion of variance in exercise intention and subsequent adherence in both a sample of patients attending a structured outpatient cardiac rehabilitation program (Blanchard et al., 2003) and in a sample of 30 to 60 year old men in the community (Nguyen et al., 1997). Additionally, hopeless individuals have negative and helplessness expectancies about changing future outcomes (Abramson et al., 1989) and therefore

individuals with hopelessness may be unable to identify a purpose in exercise participation if they do not believe it will make a difference in their outcome.

Depression, as a concept closely related to hopelessness, has been found to be predictive of cardiac rehabilitation exercise participation in a number of studies. A history of depression prior to hospitalization for MI or coronary artery bypass surgery was predictive of decreased participation in an outpatient cardiac rehabilitation program in a multivariate analysis of 226 American men and women age 62 to 92 years (Ades et al., 1992). In a study examining 204 American men and women post-MI, hospitalized patients who had symptoms of mild, moderate, or major depression reported lower adherence to regular exercise at four months after discharge (Ziegelstein et al., 2000). A smaller study sample ($n = 46$) in a structured outpatient cardiac rehabilitation program found depression to have a significant negative influence on adherence to exercise (Glazer et al., 2002).

Participation in an outpatient cardiac rehabilitation exercise program has also been shown to decrease depression. A study following 107 men and women with CHD and myocardial ischemia over a four-month period of time found that depression was significantly reduced among participants in the exercise program as compared to those who did not participate (Blumenthal et al., 1997). A sample of 268 CHD patients age 65 or more years who participated in a 12-week outpatient cardiac rehabilitation exercise program showed a significant decrease in depression at the completion of the program (Milani & Lavie, 1998). Because hopelessness is closely related to depression, and because hopeless individuals have negative and helplessness expectancies about

changing their future outcomes, hopelessness may be related to cardiac rehabilitation exercise participation.

Although no research was found examining the relationship between hopelessness symptoms and physical functioning in a CHD population, hopelessness symptoms have been associated with poorer functional status in men with cancer and AIDS (VanServellen et al., 1996) and may be correlated with physical functioning post-MI. In addition, depression symptoms have been negatively related to physical functioning in CHD patients. In a study examining 303 CHD patients in an outpatient cardiac rehabilitation program, increased depression was found to be a significant predictor of decreased baseline physical functioning ($r = -0.022$, $r^2 = 0.05$, $p < 0.001$) (Ades et al., 1999). In the study by Ades et al., the best determinant of improvement in physical functioning after rehabilitation exercise was the baseline physical functioning score; however, the best training-related correlate of improved physical functioning was a decrease in depression ($r = 0.36$, $r^2 = 0.13$, $p < 0.001$) (Ades et al.). Baseline depression scores have been found to account for approximately 10% of the variance associated with decreased aerobic capacity in patients attending a structured outpatient cardiac rehabilitation program, controlling for demographic variables and adherence (Glazer et al., 2002). Since hopelessness symptoms have been associated with poorer functional status in other illness populations, and the related concept of depression has been correlated with decreased physical functioning in subjects with CHD, hopelessness may be associated with decreased physical functioning post-MI.

In summary, hopelessness has been found to be prevalent and severe in individuals with psychological and physical illnesses. Hopelessness has also been found

to have significant impact on health outcomes, although the biopsychosocial relationship between hopelessness, CHD, and related health outcomes is unknown. The frequency, severity, and impact of hopelessness post-MI have not been previously examined.

Although increased depression has been found to decrease cardiac rehabilitation exercise participation and physical functioning in CHD patients, and increased hopelessness has been found to be predictive of decreased physical functioning in patients with other life threatening illnesses, the impact of hopelessness on the post-MI outcomes of cardiac rehabilitation exercise participation and physical functioning is not known.

Methodological Issues

Hopelessness studies over the past 30 years have used a variety of methodological approaches. A number of study designs have been cross-sectional in nature (Beck et al., 1993; Cochinov et al., 1998; Joiner et al., 2001; Northouse et al., 1995; VanServellen et al., 1996), allowing for an examination of the association between variables, but limited in their ability to examine changes over time or to contribute to the understanding of causation. Other studies have used a longitudinal design (Anda et al., 1993; Beck et al., 1985; Everson et al., 1996; Everson et al., 1999; Lewis et al., 2001; Northouse et al., 2001; Watson et al., 1999), permitting some examination of change over time.

Hopelessness studies in the field of psychology that have focused on its relationship to depression, suicidal ideation, or ultimate suicide in psychiatric inpatients and outpatients have used fairly large sample sizes, ranging from approximately 200 to 2,000 participants (Beck et al., 1990; Beck, et al., 1993; Beck et al., 1985; Wetzal et al., 1980). Studies that have focused on hopelessness as a precursor to hopelessness depression in college students have also employed moderate to large samples (i.e. 110 to

5,500 participants) (Alloy & Clements, 1998; Alloy et al., 1997; Joiner et al., 2001). One study examining hopelessness depression as a distinct subtype of depression used a large sample of 1,500 Air Force cadets and 3,000 psychiatric outpatients (Joiner et al.).

Hopelessness research in nursing and medicine has focused on both the relationship between hopelessness and morbidity and mortality in physically ill populations as well as causality between hopelessness and health outcomes. These studies have used a wide range of sample sizes. Correlational studies have employed small (i.e. 30 per group) (VanServellen et al., 1996) to moderately large (i.e. 200 to 300 per group) (Cochinov et al., 1998; Northouse et al., 1995) sample sizes. Studies focusing on causality have used moderate to large sample sizes, ranging from 130 (Northouse et al., 2001) to 2,500 (Anda et al., 1993; Everson et al., 1996).

The Beck Hopelessness Scale® (BHS®) (Beck et al., 1974) is the most widely used hopelessness tool in psychology research. Although the 20-item BHS® is commonly used in nursing research (Northouse et al., 1995; Northouse et al., 2001; VanServellen et al., 1996), much of the hopelessness research done in medicine has employed subscales of other psychosocial measures to examine hopelessness. In fact, many of the hopelessness instruments used in medicine have been one- or two-item measures. A two-item hopelessness scale (i.e. “I feel that is impossible to reach the goals I would like to strive for” and “The future seems to me to be hopeless, and I can’t believe that things are changing for the better”) was used in the Kuopio Ischemic Heart Disease Study (Everson et al., 1996; Everson et al., 2000). In the National Health Examination Follow-up Survey hopelessness was measured by the single item, “Have you felt so sad, discouraged, hopeless or had so many problems that you wondered if anything is

worthwhile?” from the full four-item depression subscale of the General Well-Being Schedule (Anda et al., 1993). Hopelessness has also been examined in a sample of patients with advanced terminal cancer by using one pessimism item from the Beck Depression Inventory and one discouragement/pessimism/hopelessness item from the Schedule for Affective Disorders and Schizophrenia (Cochinov et al., 1998). It is doubtful that these measurement subscales with so few items capture the multidimensionality of hopelessness.

Avenues for Exploration in Hopelessness Research

Research is needed to describe the frequency and severity of hopelessness symptoms in the post-MI population as this is currently unknown. In particular, research is needed in the initial recovery period after the MI as this is the time period when the myocardial tissue heals and transition back to baseline activities occurs. An examination of predictors of hopelessness symptoms in post-MI patients is also needed in an effort to identify those patients at highest risk for hopelessness. An analysis of the relationship and distinction between hopelessness and depression symptoms is warranted as interventions for these two concepts may differ. Additionally, the relationship between hopelessness symptoms and the outcomes of cardiac rehabilitation exercise participation and physical functioning is warranted as these are two important post-MI outcomes already known to be affected by the closely related concept of depression.

The current study is intended to fill some of the gaps in hopelessness research in the post-MI population by examining the frequency and severity of hopelessness symptoms and depression symptoms among post-MI patients three-months after hospital discharge, potential predictors of hopelessness, and effects of hopelessness on exercise

participation and physical functioning (see conceptual model in Figure 2). This information will contribute to the practitioner's understanding of the pervasiveness and severity of hopelessness symptoms in the early post-MI recovery period, those post-MI patients at greatest risk for hopelessness symptoms, and the effects that hopelessness might have on post-MI outcomes. Ultimately this knowledge may be used as a foundation for potential interventions to prevent or treat hopelessness symptoms and to improve exercise participation and physical functioning in those individuals who are hopeless post-MI.

The present study additionally analyzes the relationship between hopelessness and depression symptoms in post-MI patients and attempts to further differentiate hopelessness from depression by examining baseline hopelessness symptoms as an independent predictor of cardiac rehabilitation exercise participation and physical functioning at three-months after hospital discharge (see conceptual model in Figure 2). This information will add to the body of knowledge related to hopelessness and depression and may serve as a catalyst for further hopelessness-depression research in the MI population. Study findings may contribute to clarification of both the conceptual and operational definitions of hopelessness and serve as a foundation for further hopelessness research.

In summary, it is anticipated that this study will begin to fill the knowledge gap in existing hopelessness research related to the post-MI population, contributing to the knowledge base of nursing and other health disciplines caring for MI patients. Because there is no existing research related to hopelessness post-MI, this study will additionally lay the groundwork for future research aimed at more in-depth examination of

hopelessness symptoms in the post-MI recovery period. This study and future research may eventually serve as a foundation for understanding the biopsychosocial relationship between hopelessness, CHD, and related health outcome and in designing effective interventions that prevent or treat hopelessness symptoms and promote cardiac rehabilitation exercise participation and optimal physical functioning of the MI patient.

Chapter 1 and 2 served to provide the background, research questions and conceptual model for the proposed study. Chapter 3 has presented the current state of hopelessness research, gaps in the literature, and avenues for future exploration. The methodology of the study will be discussed in Chapter 4. Chapters 5 and 6 will present the results of the study and discussion of the findings.

Chapter 4

METHODOLOGY

Methodology of the study will be presented in this chapter. First the study's design, sample and setting will be discussed. This will be followed by a description of the operational definitions and measurement of the key variables. Data collection and procedures to protect the rights of human subjects will be then discussed. Finally, a description of the data analysis procedures will be presented.

Design

A descriptive research design using data from two waves of a three wave panel study was used in this study. Predictors were examined using baseline data and outcomes were examined using three month data, to answer the following research questions:

- 1) What is the frequency and severity of hopelessness symptoms and depression symptoms among post-MI patients at three-months after hospital discharge?
- 2) What is the relationship between hopelessness symptoms and depression symptoms among post-MI patients at three-months after hospital discharge?
- 3) For those post-MI patients who have hopelessness symptoms at three-months after hospital discharge, what factors present at baseline are predictive of their three-month hopelessness scores?
- 4) Are hopelessness symptoms at baseline predictive of participation in cardiac rehabilitation exercise and physical functioning among post-MI patients at three-months after hospital discharge?

The conceptual definitions of key variables were presented in Chapter 2. This research focused on a description of hopelessness and depression symptoms and the

relationship between hopelessness symptoms to outcomes in the initial recovery period after a MI, as these have not been previously examined. It is recognized that these variables can change over time and should also be examined at intervals beyond three-months.

Sample and Setting

The sample for this study came from the AHRQ-funded project (HS10531), entitled, “Patient Decision Support and Coaching Project,” referred hereafter as the Heart After Hospital Recovery Planner (HARP) study. Dr. Margaret Holmes-Rovner, Principal Investigator for the HARP study, granted permission to this investigator to use the HARP study data. The major aim of the HARP study was to test the effects of a brief six-session program delivered to patients with acute coronary syndrome (ACS) after hospital discharge. The HARP intervention was delivered to patients over the telephone by a trained health educator. The HARP study intervention adapted a relapse prevention model smoking cessation program for use with the multiple risk factors of smoking, physical activity, diet, stress, and compliance with medications. The HARP study enrolled subjects from January 14, 2002 through April 13, 2003 at five mid- to large-size community hospitals in two central Michigan communities.

A total of 721 subjects who were approached during their hospitalization for ACS consented and were enrolled in the HARP study. A total of 527 subjects (26.9% attrition) were contacted by telephone in their homes approximately two weeks after hospital discharge ($M = 14.1$ days, $SD = 9.6$) and completed structured baseline interviews. However, only 513 of the baselined subjects had a confirmed discharge diagnosis of ACS. Of these, 431 subjects completed three-month telephone interviews (attrition

between baseline and three months = 16%). A comparison of demographic characteristics between the enrolled subjects and those interviewed at baseline and three months indicated no significant differences, with the exception of a difference in mean age between the enrolled ($M = 69.96$ years, $SD = 14.80$) and baseline ($M = 61.16$ years, $SD = 12.96$) subjects.

For the purposes of this investigation, only those subjects with a confirmed diagnosis of MI at discharge were used in the analysis. A total of 351 subjects with a confirmed diagnosis of MI completed interview data at three months. Table 1 summarizes characteristics of the 351 subjects. Gender and race distributions were typical of MI (American Heart Association [AHA], 2004). Based on estimated incidence rates by the AHA, it was anticipated that one-third of participants would be under age 65 years. However, 67.5% of study participants were under 65 years of age at time of enrollment into the study, with a mean of 60 years ($SD = 11.3$) and a range of 32 to 99 years. Twenty-one percent of subjects reported a history of diagnosis or treatment for depression, which is comparable to previous research (i.e. 16-28%) (Ariyo et al., 2000; Frasure-Smith et al., 1993; Hance et al., 1996). Twenty-nine percent of subjects reported a history of MI, which is less than the national average (i.e. 41%) (AHA). It is unknown why only 22% of subjects ($n = 75$) responded to the presence of caregiver item; however, due to the low response rate, this item was not used in the study. An average ejection fraction of 50% indicated fairly well preserved left ventricular function in this group, possibly related to the younger age of the sample and lower percentage of subjects with a history of prior MI.

Table 1

Characteristics of the Sample

Characteristic	n	%
Gender		
Female	123	35
Male	228	65
Race		
Non-Hispanic Caucasian	300	86
African-American	37	11
Hispanic Caucasian	8	2
American Indian	6	2
Marital status		
Married	252	72
Separated	9	3
Divorced	40	11
Widowed	41	12
Never married	9	3
History of diagnosis or treatment for depression		
Yes	73	21
No	275	78
Don't know	3	1

Table 1 (continued)

Characteristic	n	%	
History of prior heart attack			
Yes	102	29	
No	246	70	
Don't know	3	1	
Presence of caregiver			
Yes	59	17	
No	16	5	
Group assignment			
Intervention	178	51	
Control	173	49	
	n	M (SD)	(Range)
Age	351	60 (11)	32-99
Disease Severity			
Ejection fraction (percent)	305	50 (13)	15-90

Data were used from both the intervention and control groups of the HARP study. Subjects were fairly well distributed between intervention (51%) and control (49%) arms of the study. Demographic characteristics did not differ significantly between the two study arms, with the exception of age. Subjects in the intervention group were slightly younger ($M = 58.49$, $SD = 10.65$) than those in the control group ($M = 60.96$, $SD = 11.90$) ($t = 2.05$, $df = 349$, $p = 0.04$). There were no significant differences in the levels of hopelessness symptoms between the intervention ($M = 1.66$, $SD = 1.52$) and control ($M = 1.51$, $SD = 1.55$) groups prior to the intervention ($t = 0.91$, $df = 349$, $p = 0.37$). Intervention and control group assignment was used as a control variable in the study.

Operational Definitions

Operational definitions of the current study's key variables are presented below. First, operational definitions for hopelessness symptoms and depression symptoms will be presented. Next, the antecedent patient factors will be operationally defined. Finally, the operational definitions for the dependent variables, cardiac rehabilitation exercise participation and physical functioning, will be discussed.

Hopelessness symptoms. The patient's report of negative outcome expectancies and helplessness expectancies (Beck, et al., 1974).

Depression symptoms. Depressed affect/mood, absence of well-being/positive affect, somatic/vegetative activity, and interpersonal factors as reported by the patient (Radloff, 1977).

Antecedent patient factors. The patient's self report of age, gender, race, marital status, presence of caregiver, history of depression, and history of prior MI. Control or experimental group assignment is defined as the randomization assignment as

documented on the study questionnaire by HARP study personnel. Disease severity is operationally defined as the patient's left ventricular ejection fraction as recorded in the patient's chart.

Cardiac rehabilitation exercise participation. The patient's self report of participation in a hospital-based outpatient cardiac rehabilitation exercise program and/or a home-based cardiac rehabilitation exercise program.

Physical functioning. The patient's report of his or her ability to perform various activities of daily living (Hlatky, et al., 1989).

The operationalization of the key study variables is further discussed below by summarizing the instruments for the study and their relative psychometric properties.

Instruments

Interview instruments to measure hopelessness symptoms and depression symptoms will be discussed first. Next, the measures for the antecedent patient factors will be presented. Finally, the instruments to measure the dependent variables (i.e. cardiac rehabilitation exercise participation and physical functioning) will be described. A summary of the measures for the study is presented in Table 2, including the research question(s) addressed by each measure, collection point(s), number of items, score ranges, and psychometric properties. Copies of all measures appear in the Appendices.

Beck Hopelessness Scale® Cognitive Expectations Factor. The patient's hopelessness symptoms were measured in the study using the cognitive expectations factor of the full Beck Hopelessness Scale® (BHS®) (Beck et al., 1974). The full BHS® is a 20-item true/false scale that is based on three dimensions of hopelessness:

Description of Measures for the Study, Data Collection Points, Number of Items, Score Ranges and Psychometric Properties

Research question	Variable of interest	Instrument	Collection point	Number of items	Score range	Psychometric Properties
1, 2, 3, 4	Hopelessness symptoms	Beck Hopelessness Scale® Cognitive Expectations Factor	Baseline 3 months	5	0 – 5	Reliability = 0.66 Validity = unknown
1, 2	Depression symptoms	Center for Epidemiologic Studies- Depression Scale (CES-D)	Baseline 3 months	20	0 – 60	Reliability = 0.85 - 0.95 Validity = established
3	Antecedent patient factors	Self report demographic questionnaire	Baseline	8	Ejection fraction= 0 – 100 All other items dichotomous	Ejection fraction: Reliability = established Validity = established
4	Cardiac rehabilitation exercise participation	Cardiac rehabilitation exercise participation questionnaire	3 months	12	Average days of exercise/week= 0 – 7 All other items dichotomous	Reliability = unknown Validity = unknown
4	Physical functioning	Activity Status Index (ASI)	3 months	12	0 - 58.2	Reliability = 0.80 - 0.98 Validity = established

(a) affective, (b) motivational, and (c) cognitive expectations (Beck et al., 1974). Alpha coefficients of 0.93 for patients who attempted suicide (Beck et al., 1974), 0.84 for suicidal elderly patients (Beck et al., 1974), and 0.73 for women prior to breast biopsy (Northouse et al., 1995) have been reported with the BHS®. Content validity was established in Beck's original work (Beck et al., 1974). Criterion-related validity has been demonstrated in correlating the BHS® with other measures of mood disorders (Beck, Steer, Beck, & Newman, 1993). Construct validity has been confirmed by comparing BHS® scores with clinical ratings of hopelessness patients hospitalized for attempted suicide ($r = 0.62$) and medical outpatients ($r = 0.74$). Factor analytic studies have confirmed the three scale factors. The BHS® has demonstrated good sensitivity and fair specificity (Beck et al., 1974).

Use of the full 20-item BHS® would have been optimal; however, it was determined that the addition of 15 more items to an already lengthy battery of instruments would have created excessive burden for study participants. The 5-item true/false expectations factor was selected for consistency with the Theory of Hopelessness Depression, which defines hopelessness as negative outcome and helplessness expectancies (Abramson et al., 1989). The expectations factor, items 4, 7, 8, 14, and 18 of the BHS® (see sample items in Appendix), includes anticipations regarding what life will be like in the future (Beck et al., 1974). Reliability of the expectations factor has not been reported in the literature; however, item-total correlations for the factor's five items have been reported as 0.39, 0.72, 0.63, 0.62, and 0.51 respectively in a population of outpatient and inpatient psychiatric patients (Beck et al.). An internal consistency (KR-20) of 0.66

was reported in the HARP study pilot of CHD patients, with item-total correlations for the factor's five items of .21, .62, .32, .55, and .51 respectively.

For the current study reliability of the hopelessness factor was examined both before and after imputation of missing values. A more conservative approach is taken by reporting the lesser of these values (i.e. before imputations). In the current study, an internal consistency (KR-20) of 0.71 was found at baseline, with item-total correlations of 0.35, 0.58, 0.36, 0.51, and 0.58 respectively. An internal consistency (KR-20) of 0.75 was found at three months, with item-total correlations of 0.37, 0.63, 0.42, 0.55, and 0.66 respectively. The internal consistency values of the scale at baseline (0.71) and three months (0.75) are acceptable (Nunnally & Bernstein, 1994) and similar to reliability found in previous research with physically ill subjects using the full BHS® ($\alpha = 0.73$) (Northouse et al., 1995). It was determined that the alpha coefficient of the baseline scale could not be improved if any item was deleted, while the alpha coefficient for the three month scale could be slightly improved ($\alpha = 0.76$) if item #4 was deleted. However, the importance of the item's contribution to the overall operational definition was deemed more important than the slight improvement in reliability. It was also recognized that items #7, 8, and 14 had lower item-total correlations in this sample of MI patients as compared to mentally ill populations (Beck et al., 1974), yet items #4 and #18 had similar or higher item-total correlations respectively in the MI sample as compared to mentally ill populations.

Validity of the cognitive expectations factor of the BHS® is limited in the literature and is not available in the *Beck Hopelessness Scale® Manual* (Beck & Steer, 1993). Sensitivity and specificity of the cognitive expectations factor of the BHS® is also

not available. This is recognized as a limitation in the present study. Criterion-related validity was examined in the current study by correlating the five-item cognitive expectations factor with the one hope item within the absence of well-being/positive affect factor/subscale of the CES-D at both baseline and three months. The strength of the correlation between the hopelessness total score and absence of hope item from the CES-D was fairly weak at both baseline ($r = 0.47$) and three months ($r = 0.45$). The lack of a strong relationship between the hopelessness score and lack of hope item could indicate that the five-item cognitive expectations factor may not be a valid measurement of lack of hope or hopelessness. Perhaps more importantly, the fairly weak correlation between the hopelessness and lack of hope scores may indicate that hopelessness is not a polar opposite of lack of hope.

Content validity was examined by reviewing the literature to examine the degree to which the five-item cognitive expectations factor of the BHS® covers the domain of hopelessness in a MI population. Hopelessness is defined as a negative expectancy concerning one's future, including expectations of helplessness in changing one's future (Abramson et al., 1989). The content of the five questions included in the cognitive expectations factor of the BHS® are summarized in sample items reproduced with permission of the Publisher, Harcourt Assessment, Inc. (see Appendix). Items #7 and #18 focus on a negative expectancy of the future, while item #14 focuses on a helplessness expectancy toward the future. Items #4 and 8, which had the lowest item-total correlations, are not as clearly focused on negative and helplessness expectancies. Instead, items #4 and 8 might be better described as focusing on the constructs of an external locus of control or "luck".

In examining content validity further, hopelessness can be prompted by a life event, such as a MI, which the individual attributes as negative (Abramson et al., 1989). Hopelessness is more likely to occur if a person believes that the negative consequence is important, unlikely to change, and affects many important areas of one's life (Abramson et al.). A MI is commonly perceived as an important negative event that affects a person's lifestyle in several respects, including changes in diet, exercise, and smoking habits. Additionally, a patient with a MI is typically educated that the resulting myocardial damage is permanent and CHD is a chronic disease process. The patient with a MI learns that there should be a life-long focus on prevention of further disease, future MI, and cardiovascular death. Therefore, a MI would be expected to be attributed as a negative life event that could potentially lead to hopelessness.

Hopelessness symptoms were measured at baseline and three-months after hospital discharge using the five items of the cognitive expectations factor of the BHS®. A total score was calculated by adding the scores for the five items. A total score thus ranged from 0 (low) to 5 (high). For the current study, the five-item instrument was scored as a continuous scale to test associations between study variables. A cut-off score indicative of the presence of hopelessness has not been established for the five-item factor. However, a score of 9 or more on the full 20-item BHS® has been associated with a significant risk of suicide (Beck et al., 1990). For the current study, a cut-off score of 3 or higher was considered indicative of moderate to severe levels of hopelessness for the five-item scale. A cut-off score of 3 was selected as it is similarly proportionate to the cut-off of 9 or more on a 20-item scale and 3 is a half-way point between the possible scores of 0 to 5.

Center for Epidemiologic Studies-Depression Scale. Depression symptoms were measured using the Center for Epidemiologic Studies-Depression Scale (CES-D) (Radloff, 1977) at baseline and three-months after hospital discharge. The CES-D is a 20-item screening instrument designed to measure current level of depression symptoms. Each response is scored from zero to three. A total score is calculated by adding the item scores together, with a total range of scores from zero (low) to 60 (high). Alpha coefficients of 0.85 to 0.95 have been found in general, psychiatric, and medically ill populations (Arean & Miranda, 1997; Radloff). Alpha coefficients (prior to imputation of missing values) were 0.84 at baseline and 0.86 at three-months in the current study. The CES-D has demonstrated content, criterion-related, and construct validity in a variety of groups, including the general community, psychiatric patients (Radloff), and CHD patients (Blumenthal et al., 1997). Confirmatory factor analyses have validated four subscales: (1) depressed affect/mood, (2) absence of well-being/positive affect, (3) somatic activity, and (4) interpersonal subscales (Radloff; Sheehan, Fifielfield, Reisine & Tennen, 1995). The CES-D has demonstrated good sensitivity and specificity (Radloff). Data provided by the CES-D may be presented as a dichotomous measure, continuous measure, or grouped by factor scores (Lyness, Noel, Cox, King, Conwell, & Caine, 1997). A cut-off total score of 16 or above is commonly considered a positive screen for depression symptoms (Radloff). The CES-D was used for the current study as a continuous measure of depression symptoms. For descriptive purposes, total scores of 16 or greater were viewed as indicative of moderate to severe levels of depression.

Antecedent patient factors. Antecedent patient factors, including age, gender, race, marital status, presence of caregiver, history of depression, history of prior MI,

intervention versus control group assignment, and disease severity (i.e. ejection fraction) were collected at baseline using selected items from a demographic questionnaire and chart abstraction form developed for the HARP study. The majority of these items were treated as dichotomous or categorical variables. Due to the small number of subjects in the non-Caucasian categories, race was categorized as Caucasian and non-Caucasian. Because there were a relatively small number of subjects in non-married categories, marital status was categorized as married and non-married. Age was treated as a continuous variable.

Disease severity was measured by left ventricular ejection fraction (LVEF). The presence of left ventricular dysfunction in the post-MI period has been recognized as an important determinant of increased morbidity and mortality. Early studies showed that there is an inverse relationship between LVEF and mortality post-MI, with events increasing dramatically in post-MI patients with LVEF less than 40% (Gottlieb, McDermott, & Eberly, 1992; Multicenter Postinfarction Research Group, 1983). More recently, LVEF has been found to be an independent predictor of major adverse events post-MI, including heart failure, new ischemic cardiovascular events, and death (Richards et al., 2003).

The degree of LVEF impairment is commonly assessed using the measurement of left ventricular ejection fraction (LVEF) percent. LVEF most commonly ranges from 0 to approximately 65% (Stempien-Otero & Weaver, 1998). LVEF has been used as a continuous or categorical variable in a number of recent studies (Carney et al., 2001; ENRICH Investigators, 2001; Frasure-Smith et al., 1995; Frasure-Smith et al., 2000). A common categorization of LVEF is $\leq 35\%$ and $> 36\%$ (Frasure-Smith et al., 1995;

Frasure-Smith et al., 2000). For the Harp study the percent of LVEF was taken as documented on a cardiac catheterization or echocardiogram report post-MI during the subject's hospitalization. LVEF could not be obtained for every patient in the current study as some did not undergo cardiac catheterization or echocardiogram procedures. LVEF values were thus grouped into three categories for analysis: 1) 15-34%, 2) 35% and above, and 3) no available information. This allowed for the ordinal nature of the data to be maintained, yet no subjects were excluded from analysis. Although the measurement of left ventricular ejection fraction (LVEF) percent should be similar between cardiac catheterization and echocardiogram tests (Stempien-Otero & Weaver, 1998), it is recognized that the two different methods, in addition to the various equipment used at five different hospitals, may have potentially affected the reliability of this measure.

Cardiac rehabilitation exercise participation. Data related to participation in exercise was collected at three months after hospital discharge. Participation in cardiac rehabilitation exercise has been measured in a variety of ways in studies, including self-reported adherence to recommended regular exercise (Ziegelstein et al., 2000), the number or percentage of exercise appointments in an outpatient cardiac rehabilitation exercise program (Glazer et al., 2002; Hershberger, Robertson & Markert, 1999), the percentage of outpatient exercise sessions attended divided by the number of exercise sessions prescribed (Blanchard et al., 2003), the actual exercise behaviors divided by the individual's exercise intention (Konradi & Lyon, 2000), and the frequency of on-and off-site exercise of 30 minutes or more per session (Carlson, Johnson, Franklin & Vanderlaan, 2000). However, a reliable and valid tool related to hospital- and home-

based cardiac rehabilitation exercise participation was not found in the literature. Consequently, participation in cardiac rehabilitation exercise was examined using self-report questions from a 12-item questionnaire developed for the HARP study. The HARP study exercise measure was developed based on a review of the literature and discussions with experts in cardiac rehabilitation exercise and post-MI adherence. This tool provided data regarding physician recommendation for exercise and patient follow-through in starting and maintaining hospital- or home-based cardiac rehabilitation exercise. Analysis allowed for the possibility that subjects may exercise in both hospital- and home-based settings. Validity and reliability could not be established for this tool and it is recognized that the performance of this tool may be a limitation to the study.

Physical functioning. Physical functioning was examined using the Activity Status Index (ASI) (Hlatky et al., 1989), a 12-item scale designed to measure functional capacity of cardiovascular patients based on the patient's ability to perform activities of daily living. The ASI was developed to correlate with peak oxygen uptake as one criterion of functional status. Each response, scored from one to four, is weighted based on known metabolic cost of each activity (Hlatky et al., 1989). Composite scores are added and can range from 0 (low) to 58.2 (high). Mean ASI scores for patients with CHD have ranged from 20.0 to 21.6 for patients awaiting bypass surgery or angioplasty respectively (Hlatky et al., 1989). A median ASI score of 19 has been found in patients 20 days post-MI and a score of 35 in patients one year post-MI (Hlatky, et al., 1997). Mean ASI scores of 21.9 for Caucasian women and 14.4 for African-American women have been found one year post-MI (Rankin, 2002). Reliability of the ASI has been determined using Cronbach alpha in patients with angina pectoris ($\alpha = 0.98$) (Beckman,

Barefoot, Haney, Williams, & Mark, 1994) and in women recovering from MI ($\alpha = 0.80$ to 0.88) (Rankin). An alpha coefficient (prior to imputation of missing values) of 0.80 was found at three-months in the current study.

Validity of the ASI instrument has been confirmed by examining Spearman correlations of the ASI and other established physical functioning instruments with peak oxygen uptake capacity in two samples. Correlations with the ASI were higher in the two samples (0.81 and 0.58 respectively) than correlations using the Canadian Cardiovascular Society Classification (of 0.58 and 0.49 respectively) and the Specific Activity Scale (0.67 and 0.30 respectively) (Hlatky et al., 1989). The ASI has shown sensitivity in discriminating between patients with and without congestive heart failure and history of MI (Nelson, Herndon, Mark, Pryor, Califf, & Hlatky, 1991), although serial change has not been assessed (Coyne & Allen, 1998). For the current study the ASI was used as a continuous measure at three-months after hospital discharge.

The study design, sample and setting, and operationalization and measurement of key study variables for the study have been presented. A discussion related to recruitment and data collection will follow. Finally, content related to human subject protection and a description of data analysis will be presented.

Procedures

Recruitment. Research nurses identified potential participants' names by reviewing daily laboratory report summaries for elevated cardiac enzyme levels (i.e. troponin). These reports were reviewed and destroyed on-site at the hospitals. After the research nurse determined eligibility, she met with patients during their hospitalization to provide a description of the study, discuss expectations, explain the patients' rights,

obtain written consent, and enrolled the patients. The research nurse obtained written informed consent for the overall HARP study from the patients during their hospitalization. Patients consented to the current study as part of the HARP study consent.

Data collection. Baseline and three month data were collected by trained research staff at the Office for Survey Research (OSR) at the Institute for Public Policy and Social Research (IPPSR) at Michigan State University (MSU). The research staff of OSR has training and expertise in providing survey data collection capacity to MSU, state government, other units of government, nonprofit organizations, and the private sector for basic or applied research. Such surveys provided by OSR include needs assessments, epidemiological studies, opinion surveys, client feedback surveys, social or economic impact studies, and political polls. Five members of the OSR research staff were trained as designated HARP study interviewers. The OSR research staff collected data for the HARP study after the patient's discharge home, at baseline ($M = 14.1$ days, $SD = 9.6$) and three months after hospital discharge via self-report telephone interviews. The OSR research staff then transferred data to the HARP study Principal Investigator via a password-protected computer disk. Trained research nurses completed chart abstraction via a review of each patient chart in the medical records department of each hospital.

Inclusion and exclusion criteria. The HARP study enrolled individuals who were admitted to an acute care hospital with a diagnosis of acute coronary syndrome (ACS). Individuals could be enrolled whether it was a first-time diagnosis of ACS or if they had a prior history of ACS. ACS is defined as any group of signs and symptoms suggestive of acute MI, ST elevation MI, non-ST elevation MI, enzyme-diagnosed MI, biomarker-

diagnosed MI, late electrocardiogram (ECG) diagnosed MI, and unstable angina (Braunwald et al., 2002). The term ACS is used at the time of initial presentation in the acute care setting to identify patients that should be considered for treatment. Clinically, the diagnosis of a MI is typically made when there is a characteristic rise and fall in cardiac biomarkers (e.g. troponin) indicative of myocardial necrosis (Braunwald et al.). In most unstable angina patients, their signs and symptoms reflect the same underlying process as acute MI (i.e. myocardial ischemia resulting from significant underlying coronary heart disease) (Braunwald et al.).

Criteria for inclusion of patients into the HARP study consisted of the following: 1) working diagnosis of ACS in the medical record, 2) a documented serum Troponin I level of ≥ 1.5 ng/ml during hospitalization, and 3) age 21 years or older. Exclusion criteria included: 1) inability to speak English or to complete study interviews or 2) anticipated discharge to a non-home setting. Only patients with a confirmed diagnosis of MI were included in the current study. A diagnosis of MI was confirmed from chart abstraction using documented discharge diagnoses.

Age inclusion. Eligible adults age 21 years and older were enrolled in the HARP study. Individuals under the age of 21 years were excluded as it is extremely rare for an individual under 21 years to suffer a MI. In addition, the sample would not contain enough participants of this age group to identify significant relationships and recovery from a MI may vary substantially for an individual less than 21 years of age. It was anticipated that one-third of participants would be under age 65 years (AHA, 2004); however, 67.5% of study participants were under 65 years of age at time of enrollment into the study, with a mean of 60 years ($SD = 11.3$) and a range of 32 to 99 years.

Gender inclusion. Eligible male and female adults were enrolled in the HARP study. AHA incidence rates indicate that only one-third of MI patients will be female (AHA, 2004). Females, including women of childbearing age, were subsequently actively recruited for the HARP study through personal contact with trained nurse interviewers. In the current study 35% of subjects were female.

Minority inclusion. Eligible adults of any race were enrolled in the HARP study. Racial minority groups were actively recruited into the study through the use of personal contact by trained research nurses. Non-Caucasian participants were differentiated via interview by the following groups: Hispanic or Latino, American Indian/Alaska Native, Asian, Native Hawaiian or other Pacific Islander, Black or African American, more than one race, unknown, or not reported. In the current study 14.5% of subjects were non-Caucasian (i.e. black/African American, Hispanic White, and American Indian).

Protection of Human Subjects

Data sources. Data were obtained for the HARP study from individually identifiable living human subjects in the form of self-report phone questionnaires and medical record data. The sample for the current research came from the HARP study. The doctoral student was given permission from Dr. Margaret Holmes-Rovner, Principal Investigator of the HARP study, to use the data. The doctoral student is not associated with the subjects in any way. Subjects were not compensated for participation in the HARP study or for the current study. Subjects did not incur any additional expense as a result of their participation in HARP study or the current study. Data for the current study were obtained specifically for research purposes.

Participants' HARP study consent forms were kept in a locked file cabinet. The completed questionnaires and chart abstraction forms were identified only by a numerical code and were kept in a separate locked file. HARP study data from the paper questionnaires and chart abstraction forms was entered into a SPSS computer program on a password-protected computer. A master list linking names with case study identification numbers was kept on a password-protected computer. Data for the current project was provided to the doctoral student on a computer disc, which was password-protected. Data for the current study came from the following measures: 1) Beck Hopelessness Scale® (BHS®) cognitive expectations factor (Beck et al., 1974), 2) Center for Epidemiologic Studies-Depression Scale (CES-D) (Radloff, 1977), 3) antecedent patient factor questions from the demographic questionnaire and chart abstraction form, 4) cardiac rehabilitation exercise questionnaire, and 5) Activity Status Index (ASI) (Hlatky et al., 1989). All information obtained from subjects was identified by case study identification number only. All data for the current study will be published in aggregate form, without agency or individual names or identification. All data will be kept at MSU for a minimum of seven years after the completion of the study.

Institutional Review Board. The HARP study has Institutional Review Board approval through each of the five enrolling hospitals and through the University Committee on Research Involving Human Subjects (UCRIHS) of Michigan State University (MSU), including approval for use of the measures used in the current study. The current study has approval through the UCRIHS of MSU. The doctoral student has adhered to all mechanisms for the protection of human subjects. The doctoral student has maintained human subject certification administered by UCRIHS.

Potential risks. Because the current research was descriptive in nature, there was minimal risk to subjects. There has also been minimal risk to participants involved in the HARP study. Participants in the HARP study may have potentially become fatigued during the interviews; however, every attempt was made by the HARP study staff to limit the length of the interview. Participants may have felt apprehensive sharing information regarding symptoms of hopelessness and depression. The IPPSR OSR research staff did not have access to subjects' depression or hopelessness scores. However, the interviewers were trained to acknowledge subjects' feelings and to refer subjects to their physicians if needed. If the interview became fatiguing or distressing to the participant, the interviewer concluded the interview immediately. Data were sent from the IPPSR OSR research staff to the HARP study staff in large batches and so there was a significant delay before depression and hopelessness scores could be calculated by HARP study staff. Because of the delay in acquiring the depression and hopelessness total scores, and because depression and hopelessness can be transient in nature, subjects were not contacted by HARP study staff for elevated depression or hopelessness scores. Any adverse events noted by the IPPSR OSR staff during phone interviews with subjects were reported promptly to the HARP study Principal Investigator.

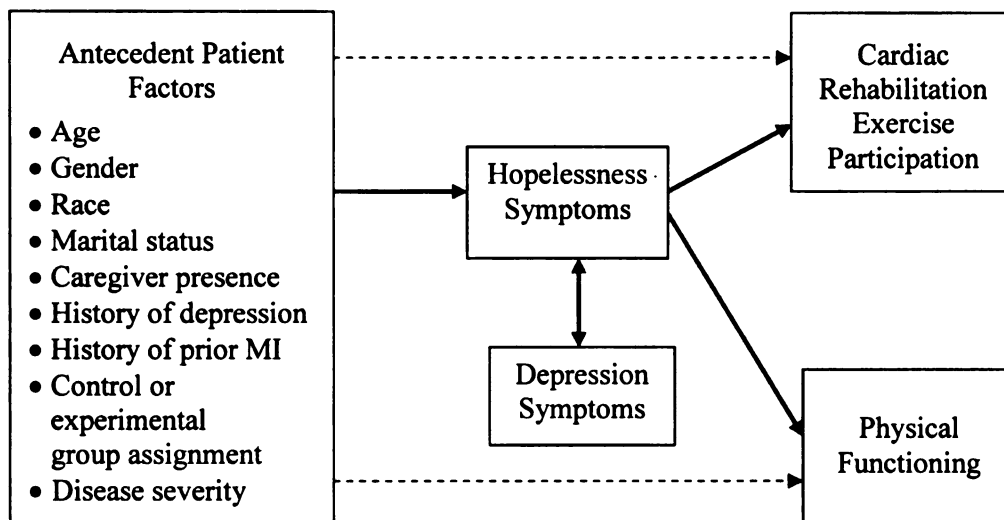
Participants were informed that they could withdraw from the HARP study at any time, without loss of benefits they would otherwise be entitled to and without penalty to their health care. A request by any subject to withdraw his/her consent for the HARP study and to discontinue participation in the study was honored promptly and unconditionally. Participants were also provided (verbally and in writing) with the names and phone numbers of the Principal Investigator for the HARP study and the Chairperson

of the MSU Institutional Review Board (UCRIHS). Breach of confidentiality was an additional risk for participants in the current study; however, strict provisions to prevent this have been in place.

Potential benefits. There may or may not have been direct benefits to the participant involved in the HARP study and current study. Participants may have experienced a therapeutic benefit through self-reflection or sharing their thoughts and feelings during the HARP study interviews. Individuals who suffer a MI in the future may benefit from the knowledge gained from the current study and future research-based interventions targeted to meet their needs. Although there was a chance that no new knowledge may have been gained from the current study, the risk was small compared to the potential knowledge that may have been gained.

Data Analysis

Data for the current study was analyzed using descriptive statistics and selected inferential statistics, namely regression. See Figure 3 for the analytic model of the study. SPSS ® version 12.0 statistical software package was used for analysis. Tests were two-tailed with level of significance set at 0.05 for all tests. Steps for analysis are presented here. First, preliminary descriptive statistics were completed to analyze the data for normality, frequency, and patterns of missing data. Strategies to manage missing data were evaluated and appropriate imputation techniques were used. Finally, analysis of the research questions for the study was addressed in the following manner:



Note. Dashed [-----] lines will be examined as control variables.

Figure 3. Analytic model of the study

Question #1. The first research question asked, “What is the frequency and severity of hopelessness symptoms and depression symptoms among post-MI patients at three-months after hospital discharge”? The proportion of subjects who expressed at least one hopelessness symptom or one depression symptom was estimated within a 95% confidence interval. For those who experienced at least one symptom, the mean and standard deviation of the number of hopelessness and depression symptoms were estimated at a 95% confidence interval. The proportion of subjects with a hopelessness total score of 3 or greater and/or a CES-D total score of 16 or greater was also reported. The examination of frequency was limited in this sample in that frequency was reported only for those subjects who met eligibility criteria and who remained in the sample at three months.

Question #2. The second question posed, “What is the relationship between hopelessness symptoms and depression symptoms among post-MI patients at three-months after hospital discharge”? The correlation between the BHS® cognitive expectations factor total score for hopelessness symptoms at three months and the CES-D total score for depression symptoms at three months was examined using the Pearson R correlation. The relationship between hopelessness an depression symptoms was further examined using cross-tabulation by categorizing the CES-D total scores into two groups and the hopelessness scores into two groups. In addition to answering the research question, the relationship between hopelessness and depression symptoms was investigated further by examining the correlation between the hopelessness symptoms total score and each of the CES-D factors/subscales at three months. The linear relationship between the hopelessness symptoms total score at baseline and depression

symptoms total score at three months was also assessed with multiple regression, controlling for antecedent patient variables and depression symptoms at baseline, using the following model:

$$\begin{aligned} \text{Expected value (depression symptoms at three-months)} = & B_0 + B_1 (\text{gender}) + B_2 \\ & (\text{race}) + B_3 (\text{marital status}) + B_4 (\text{age}) + B_5 (\text{disease severity}) + B_6 (\text{history of} \\ & \text{depression}) + B_7 (\text{history of MI}) + B_8 (\text{control or experimental group assignment}) \\ & + B_9 (\text{depression symptoms at baseline}) + B_{10} (\text{hopelessness symptoms at} \\ & \text{baseline}) + \sum B_j X_j \text{ (where } X_j = \text{other covariates)} \end{aligned}$$

Question #3: The third research question inquired, “For those post-MI patients who have hopelessness symptoms at three-months after hospital discharge, what factors present at baseline are predictive of their three-month hopelessness scores? The relationship between the antecedent patient factors and the hopelessness symptoms total score at three months was evaluated with multiple regression, controlling for hopelessness symptoms at baseline, using the following model:

$$\begin{aligned} \text{Expected value (hopelessness symptoms at three-months)} = & B_0 + B_1 \\ & (\text{hopelessness symptoms at baseline}) + B_2 (\text{race}) + B_3 (\text{marital status}) + B_4 (\text{age}) \\ & + B_5 (\text{disease severity}) + B_6 (\text{history of depression}) + B_7 (\text{history of MI}) + B_8 \\ & (\text{gender}) + B_9 (\text{control or experimental group assignment}) + \sum B_j X_j \text{ (where } X_j = \\ & \text{other covariates)} \end{aligned}$$

Question #4: The fourth question asked, “Are hopelessness symptoms at baseline predictive of participation in cardiac rehabilitation exercise and physical functioning among post-MI patients at three-months after hospital discharge?”

The linear relationship between hopelessness symptoms at baseline and physical functioning at three months was evaluated with multiple regression, using the following model, controlling for antecedent patient variables and depression symptoms at baseline:

$$\begin{aligned} \text{Expected values (physical functioning at three-months)} = & B_0 + B_1 (\text{gender}) + B_2 \\ & (\text{race}) + B_3 (\text{marital status}) + B_4 (\text{age}) + B_5 (\text{disease severity}) + B_6 (\text{history of} \\ & \text{depression}) + B_7 (\text{history of MI}) + B_8 (\text{control or experimental group assignment}) \\ & + B_9 (\text{hopelessness symptoms at baseline}) + B_{10} (\text{depression symptoms at} \\ & \text{baseline}) + \sum B_j X_j \text{ (where } X_j = \text{other covariates)} \end{aligned}$$

The extent to which hopelessness symptoms at baseline predict cardiac rehabilitation exercise participation at three months was examined using a multinomial logit regression model. This model was selected because there was no ordering to the values of exercise participation.

In summary, this study is one of the first to describe the relationship between hopelessness and depression symptoms after a MI and to examine the frequency, severity, and impact of hopelessness symptoms after a MI. This research also helps to clarify the distinction between hopelessness and depression symptoms, to identify subgroups at risk for hopelessness symptoms post-MI, and to identify the effect of hopelessness symptoms on cardiac rehabilitation exercise participation and physical functioning. This study will contribute to the knowledge base of nursing and other health disciplines as related to hopelessness research in the post-MI population. This research may additionally lay the groundwork for future research regarding the relationship and/or distinction of hopelessness and depression symptoms, predictors of hopelessness symptoms, and the effects of hopelessness symptoms post-MI, with an ultimate goal of designing effective

interventions to prevent or treat hopelessness symptoms and promote exercise and optimal physical functioning. Chapter 5 will present the results of this study. Chapter 6 will discuss study limitations and implications for nursing research and practice.

Chapter 5

RESULTS

This descriptive study was designed to describe the frequency and severity of hopelessness and depression symptoms, the relationship between hopelessness and depression symptoms, predictors of hopelessness symptoms, and effects of hopelessness symptoms among patients in the early recovery period after a MI. This study used data from two waves of a three wave panel study. Results of the study will be presented in this chapter. Analysis of data for normality, frequency, and patterns of missing data will be discussed, including strategies used to manage missing data. Analysis of the research questions will then be presented.

Preliminary Analysis of Data

Normality. Continuous variables, namely age, hopelessness symptoms, depression symptoms, and physical functioning, were examined for normality of distribution. Age was found to be fairly normally distributed. Total hopelessness scores at baseline and three months were positively skewed with negative kurtosis, but at an acceptable level for analysis (Nunnally & Bernstein, 1994). Depression total scores at baseline and three months were positively skewed with positive kurtosis, but these were also at an acceptable level for analysis (Nunnally & Bernstein). Finally, the physical functioning composite score at three months was positively skewed with negative kurtosis, but at an acceptable level for analysis (Nunnally & Bernstein).

Frequencies and missing data. The data were examined for frequency and patterns of missing data. Antecedent patient factor variables were complete, with the exception of three subjects (1%) who did not know if they had a history of prior MI, three

subjects (1%) who did not know if they had a history of depression, 46 subjects (13%) who had no documented ejection fraction, and 286 (88%) subjects who did not answer the caregiver item (see Table 1 in Chapter 4). The values for history of MI and history of depression were not imputed in that there were no other variables in the data set that could be used for the estimation of these missing values. Ejection fraction values were not imputed in that no other variables were available that could be used for estimation of the missing ejection fraction values. In addition, the lack of documented ejection fraction was expected in that some subjects would not have had a heart catheterization or echocardiogram during their hospitalization. Therefore, absence of documented ejection fraction was used as a category for analysis, allowing for the ordinal nature of the data to be maintained. Due to the high proportion of missing values (88%) for the caregiver item, this item could not be imputed (Nunnally & Bernstein, 1994) and was excluded from further analysis.

Frequencies were then examined for hopelessness symptoms, depression symptoms, physical functioning, and exercise items. Missing responses for the five-item cognitive expectations factor of the Beck Hopelessness Scale® (BHS®) at baseline and three months, the Center for Epidemiologic Studies- Depression Scale (CES-D) at baseline and three months, and for the Activity Status Index at three months, had been previously imputed by a Harp study investigator using regression substitution. For the regression substitution, CES-D regression imputations were limited to a maximum of 4 items (out of 20), so that total scores were based on original responses to at least 16 items. BHS® regression imputations were limited to a maximum of two out of five items. Less than 2% of the cases for all variables required regression imputation. PRELIS 2 ®, a

data preparation program associated with LISREL 8.70 ® software, was used by the doctoral student for further imputation of data. According to Jöreskog & Sörbom (1996) the PRELIS 2 ® missing data estimation procedure (hot-deck method) was an appropriate imputation method to use for one remaining case with three out of five missing BHS® items and one remaining case with all missing CES-D items. Finally, the cardiac rehabilitation exercise questionnaire was examined for frequency and missing values. Three subjects did not answer the item related to physician referral to a hospital-based exercise program, while one other subject did not answer the item related to physician referral to a home-based exercise program. No other variables in the data set could be used for estimation of these missing values and so these four subjects were excluded from analysis of the exercise variable.

Research Question #1: What is the frequency and severity of hopelessness symptoms and depression symptoms among post-MI patients at three-months after hospital discharge?

Hopelessness symptoms. The measure scores, including possible ranges, actual ranges, means and standard deviations for each of the continuous measures in the study, are presented in Table 3. Hopelessness symptoms were measured at baseline and three months after hospital discharge using the five-item cognitive expectations factor of the BHS®. A total score for the cognitive expectations factor of the BHS® can range from 0 (low) to 5 (high). The average baseline hopelessness score was 1.6 ($SD = 1.5$) while the average three month hopelessness score slightly decreased to 1.5 ($SD = 1.6$) (see Table 3). However, the average three-month hopelessness total score did not statistically differ from the average hopelessness total score at baseline ($t = .95$, $df = 350$, $p = 0.34$).

Although the average hopelessness total scores were only 1.6 and 1.5 at baseline and

Table 3

Measures, Possible Ranges, Actual Ranges, and Scores (n =351)

Measure	Possible range	Actual baseline range	Actual three month range	Baseline score Mean (SD)	Three month score Mean (SD)
Five-item BHS	0 to 5	0 to 5	0 to 5	1.6 (1.5)	1.5 (1.6)
CES-D	0 to 60	0 to 48	0 to 45	12.6 (9.7)	9.5 (9.5)
ASI	0 to 58.2	NA	0 to 58.2	NA	25.2 (17.4)

Note. Five-item BHS = Five item cognitive expectations factor of Beck Hopelessness Scale®; CES-D = Center for Epidemiologic Studies- Depression Scale; ASI = Activity Status Index

Table 4

*Frequency and Severity of Hopelessness Symptoms Total Scores and Depression**Symptoms Range of Total Scores*

Baseline (n = 351)			
Hopelessness symptoms		Depression symptoms	
Total score	n (%) at each score	Range of total scores	n (%) at each range
0	104 (29.6)	0 to 15	239 (68.1)
1	101 (28.8)	16 to 20	43 (12.3)**
2	55 (15.7)	21 to 30	47 (13.4)**
3	44 (12.5)*	31 to 60	22 (6.3)**
4	20 (5.7)*		
5	27 (7.7)*		

Note. * = 25.9% of subjects with score ≥ 3 , ** = 32% of subjects with scores ≥ 16

Three Months (n = 351)			
Hopelessness symptoms		Depression symptoms	
Total score	n (%) at each score	Range of total scores	n (%) at each range
0	108 (30.8)	0 to 15	271 (77.2)
1	113 (32.2)	16 to 20	33 (9.4)**
2	50 (14.2)	21 to 30	32 (9.1)**
3	30 (8.5)*	31 to 60	15 (4.3)**
4	19 (5.4)*		
5	31 (8.8)*		

Note. * = 22.7% of subjects with score ≥ 3 , ** = 22.8% of subjects with scores ≥ 16

three months respectively, 26% of subjects reported a baseline hopelessness total score of 3.0 or greater, while 23% of subjects reported a three-month hopelessness total score of 3.0 or greater (Table 4). A history of hopelessness was not collected in this study and so it is not known whether a subject's hopelessness was a chronic/pre-existing trait or a state in response to the MI event.

Depression symptoms. Depression symptoms were measured at baseline and three months after hospital discharge using the CES-D. A total score for the CES-D can range from 0 (low) to 60 (high). As seen in Table 3, the average baseline depression score was 12.6 ($SD = 9.7$), while the average depression score at three months significantly decreased to 9.5 ($SD = 9.5$) ($t = 7.18$, $df = 350$, $p = 0.00$). As depicted in Table 4, approximately 32% of subjects reported a depression total score of 16 or greater at baseline while 23% reported a score of 16 or greater at three months. The CES-D factors/subscales were examined to further explain the significant decline in depression symptoms from baseline to three months. The mood/depressed affect factor significantly decreased from 3.7 ($SD = 4.2$) at baseline to 2.6 ($SD = 3.6$) at three months ($t = 5.99$, $df = 350$, $p = 0.00$). The somatic/vegetative factor also significantly decreased from 6.8 ($SD = 4.86$) at baseline to 5.0 ($SD = 4.4$) at three months ($t = 8.04$, $df = 350$, $p = 0.00$). The absence of well-being/positive affect factor and interpersonal factor did not significantly decrease from baseline to three months.

In summary, both hopelessness and depression symptoms were prevalent and moderate to severe in a portion of the sample at three months after hospital discharge. However, depression symptoms significantly decreased from baseline to three months whereas hopelessness symptoms did not. There was high variability in the total scores of

both hopelessness and depression symptoms at baseline and three months in this sample. The high variability is likely due in part to the skewness and kurtosis of the distributions, as discussed earlier. Therefore, the mean scores may not accurately summarize the distribution of scores for this sample.

Research Question #2: What is the relationship between hopelessness symptoms and depression symptoms among post-MI patients at three-months after hospital discharge?

Correlations among continuous independent and dependent variables were examined to identify potential covariance (see Table 5). All correlations were significant at the 0.01 level. As expected, there was a strong correlation (defined as $r \geq 0.60$) between hopelessness variables over time and depression variables over time. There was a moderate correlation (defined as $r = 0.30$ to 0.59) between baseline hopelessness and baseline depression ($r = 0.52$) and three month depression ($r = 0.52$). There was a moderate correlation between three month hopelessness and baseline depression ($r = 0.49$) and a strong correlation between three month hopelessness and three month depression ($r = 0.65$).

In examining Table 5 more closely, the proportion of variance shared by baseline and three month hopelessness and depression scores ranged from 0.24 to 0.42 (computed by squaring the correlations). The variance remaining that is not shared by baseline and three month hopelessness and depression scores is therefore 0.58 to 0.76, which supports some distinction between the two constructs.

It was recognized that the moderate to strong correlations between hopelessness and depression symptoms ($r = 0.49$ to 0.65) may be an indicator of multicollinearity (vonEye & Schuster, 1998). Other indicators of potential multicollinearity were closely

Table 5

Correlations among Continuous Independent and Dependent Variables

	BHS base	BHS 3 mos	CES-D base	CES-D 3 mo	ASI 3 mo
BHS base	1.00				
BHS 3 mo	0.62**	1.00			
CES-D base	0.52**	0.49**	1.00		
CES-D 3 mo	0.52**	0.65**	0.67**	1.00	
ASI 3 mo	-0.29**	-0.32**	-0.36**	-0.48**	1.00

Note. ** $p < 0.01$

BHS base = Five-item factor of Beck Hopelessness Scale® at baseline; BHS 3 mo = five-item factor of Beck Hopelessness Scale® at 3 months; CES-D base= Center for Epidemiologic Studies- Depression Scale (CES-D) at baseline; CES-D 3 mo= Center for Epidemiologic Studies- Depression Scale (CES-D) at 3 months; ASI 3 mo= Activity Status Index at 3 months

examined. Tolerance levels were analyzed in all regression analyses that included hopelessness and depression symptoms. The tolerance levels for hopelessness and depression in these regression models ranged from 0.67 to 0.71, indicating mild collinearity (vonEye & Schuster). The following indicators of multicollinearity were not found: 1) Large changes in parameter estimates when a variable is added or removed, 2) Predictors known to be important do not carry statistically significant prediction weights, 3) The sign of a predictor is counterintuitive or illogical, 4) Wide confidence intervals for parameter estimates for predictors known to be of importance, and 5) Large variance inflation factors (vonEye & Schuster). Because some collinearity was expected between hopelessness and depression symptoms, and multicollinearity was diagnosed as mild, no countermeasures to multicollinearity were deemed necessary (vonEye & Schuster).

The relationship between hopelessness and depression symptoms at three months was examined more thoroughly by studying the correlations between the hopelessness total score and each of the CES-D factors/subscales at three months. As seen in Table 6, the hopelessness total score was strongly associated with the mood/depressed affect factor ($r = 0.62$) and moderately associated with the absence of well-being/positive affect ($r = 0.53$) and the somatic ($r = 0.51$) factors at three months. The hopelessness total score was only mildly correlated with the interpersonal factor ($r = 0.19$) at three-months.

Further examination of each of the three-month CES-D items showed that three-month hopelessness was most highly correlated with items from the mood and lack of well-being factors/subscales ($r = 0.45$ to 0.52), namely items commonly referred to as “blues,” “depressed,” “fearful,” “failure,” “lonely,” “sad,” “happy,” and “hopeful” (see

Table 6

*Correlations between Hopelessness Symptoms Total Score and CES-D**Factors/Subscales and CES-D Items at Three Months*

CES-D Factors/Subscales	CES- D Items	Correlation with hopelessness symptoms total score
Depressed affect/mood		0.62**
	3- Blues	0.45**
	6- Depressed	0.52**
	9- Failure	0.48**
	10- Fearful	0.45**
	14- Lonely	0.49**
	17- Crying	0.34**
	18- Sad	0.45**
Absence of well-being/ positive affect		0.53**
	4- Good	0.24**
	8- Hopeful	0.45**
	12- Happy	0.47**
	16- Enjoyed	0.37**
Somatic/vegetative		0.51**
	1- Bothered	0.35**
	2- Appetite	0.20**
	5- Mind	0.32**
	7- Effort	0.37**
	11- Sleep	0.37**
	13- Talked	0.31**
	20- Get going	0.35**
Interpersonal		0.19**
	15- Unfriendly	0.11*
	19- Dislike	0.21**

Note. **p< 0.01, *p< 0.05

Table 6). It is interesting to note that the total hopelessness score was only moderately correlated with the absence of hope item on the CES-D ($r = 0.45$), suggesting that hope and hopelessness may not be polar opposites. To examine whether the CES-D items that were highly correlated with the hopelessness total score at three months may potentially serve as a “hopelessness factor”, a total score was formed from the eight CES-D items. The total score based on the eight CES-D items showed a similar correlation with the hopelessness total score ($r = 0.66$) as compared to the correlation found with the 20-item depression total score at three months ($r = 0.65$).

The relationship between hopelessness and depression symptoms was further examined at three months using cross-tabulation by categorizing the CES-D total scores into two groups (i.e. 0 to 15 and 16 to 60) and the hopelessness total scores into two groups (i.e. 0 to 2 and 3 to 5). Of the total sample ($n = 351$), 10% ($n = 34$) had depression symptoms but little or no hopelessness symptoms, while 10% ($n = 34$) had symptoms of hopelessness but little or no depression. Those who had both depression and hopelessness symptoms totaled 13% ($n = 46$). Of the total sample, 67% ($n = 237$) had little or no depression symptoms and little or no hopelessness symptoms at three months.

In keeping with the theory of hopelessness depression, which conceptualizes hopelessness as a potential precursor to hopelessness depression (Abramson et al., 1989), hierarchical regression was used to examine the linear relationship between hopelessness symptoms at baseline and depression symptoms at three months. Step one of the regression model examined the influence of antecedent variables (i.e. age, gender, race, marital status, history of depression, history of MI, treatment group, and disease severity)

Table 7

Predictors of Three-month Depression Symptoms

Step	Variable	B	t	Tolerance
1				
	Age (in years)	0.00	0.09	0.92
	Gender (1 = male, 0 = female)	-2.29	-2.10*	0.89
	Race (1 = Caucasian, 0 = non-Caucasian)	-1.98	-1.39	0.96
	Marital status (1 = married, 0 = non-married)	-2.02	-1.75	0.90
	History of depression (1 = yes, 0 = no)	2.59	3.87*	0.97
	History of heart attack (1 = yes, 0 = no)	0.12	0.19	0.97
	Group assignment (1 = intervention, 0 = control)	-0.12	-0.12	0.97
	Disease severity (reference = 0-35)			
	36 and above (1 = 36+, 0 = 0-35)	-0.26	-0.18	0.57
	No EF information (1 = no EF, 0 = 0-35)	-0.03	-0.02	0.59
Model $R^2 = 0.08$ F of $R^2 = 3.38$ (9, 350), $p = .00$ Observed power = 1.0 Partial eta squared = 0.85				

Note. * $p < 0.05$

Table 7 (continued)

Step	Variable	B	t	Tolerance
2				
	Age (in years)	0.03	0.78	0.92
	Gender (1 = male, 0 = female)	-0.68	-0.80	0.88
	Race (1 = Caucasian, 0 = non-Caucasian)	-0.85	-0.77	0.95
	Marital status (1 = married, 0 = non-married)	-0.42	-0.47	0.89
	History of depression (1 = yes, 0 = no)	1.49	2.85*	0.96
	History of heart attack (1 = yes, 0 = no)	-0.03	-0.07	0.97
	Group assignment (1 = intervention, 0 = control)	-0.53	-0.69	0.97
	Disease severity (reference = 0-35)			
	36 and above (1 = 36+, 0 = 0-35)	0.03	0.02	0.57
	No EF information (1 = no EF, 0 = 0-35)	1.61	1.09	0.58
	Baseline depression (CES-D total)	0.62	15.20*	0.93
Model R ² = 0.45				
F of R ² = 28.21 (10, 350), p = 0.00				
Observed power = 0.15				
Partial eta squared = 0.98				

Note. *p < 0.05

CES-D = Center for Epidemiologic Studies- Depression Scale

Table 7 (continued)

Step	Variable	B	t	Tolerance
3				
	Age (in years)	0.02	0.70	0.92
	Gender (1 = male, 0 = female)	-1.11	-1.35	0.87
	Race (1 = Caucasian, 0 = non-Caucasian)	-0.90	-0.85	0.95
	Marital status (1 = married, 0 = non-married)	0.14	0.16	0.88
	History of depression (1 = yes, 0 = no)	1.49	2.98*	0.96
	History of heart attack (1 = yes, 0 = no)	-0.04	-0.09	0.97
	Group assignment (1 = intervention, 0 = control)	-0.79	-0.06	0.96
	Disease severity (reference = 0-35)			
	36 and above (1 = 36+, 0 = 0-35)	0.43	0.39	0.56
	No EF information (1 = no EF, 0 = 0-35)	1.58	1.12	0.58
	Baseline depression (CES-D total)	0.49	10.81*	0.69
	Baseline hopelessness (Five-item BHS total)	1.55	5.50*	0.71
Model $R^2 = 0.50$				
F of $R^2 = 30.60$ (11, 350), $p = 0.00$				
Observed power = 0.13				
Partial eta squared = 0.99				

Note. * $p < 0.05$

CES-D = Center for Epidemiologic Studies- Depression Scale; BHS = Beck Hopelessness Scale®

on three-month depression symptoms. As depicted in Table 7, female gender and history of depression were the only antecedent variables predictive of three-month depression symptoms. Step one of the model was significant; however, it accounted for only 8% of the variance in depression symptoms. Examination of unconstrained and constrained models showed that each individual predictor offered a significant contribution to the model. Additionally, examination of residuals showed that residuals were fairly normally distributed. Tolerance levels for all variables (with the exception of the dummy-coded ejection fraction variables) ranged from 0.89 to 0.97, indicating that the variables are relatively independent of each other. Observed power was high and there was a large effect size (see Table 7).

The baseline depression symptoms total score was added as a control variable in the next step of the hierarchical regression analysis. As indicated in Table 7, the baseline depression score was predictive of three month depression in this model. History of depression also remained predictive, whereas female gender did not. This model was significant, accounting for 45% of the variance in three month depression symptoms score. Analysis of unconstrained and constrained models showed that each predictor provided a significant contribution to the model. Additionally, examination of residuals showed that residuals were fairly normally distributed. Tolerance levels for this step of the model were appropriate. Observed power was low (0.15); however, there was a large effect size (partial eta squared = 0.98) to contribute to the effect significance.

The baseline hopelessness symptoms total score was added in step three of the model. As depicted in Table 7, the addition of the baseline hopelessness score further helped to explain 5% of the variance in the three month depression score. This significant

change in variance was evident despite mild correlations between antecedent variables and the baseline hopelessness symptoms total score (see Table 8). Both baseline depression and baseline hopelessness total scores were predictive of three month depression. History of depression also remained a predictor. The model was significant and accounted for 50% of variance in the three month depression symptoms score. Examination of unconstrained and constrained models showed that each predictor offered a significant contribution to this model. Residuals were fairly normally distributed. Tolerance levels for baseline depression and baseline hopelessness were 0.69 and 0.71 respectively in this model, indicating mild collinearity of the two variables with other independent variables in the model. Observed power was low (0.13); however, there was a large effect size (partial eta squared = 0.99) to contribute to the effect significance.

To analyze hopelessness symptoms as a predictor of three month depression symptoms more closely, multiple regression with a simultaneous entry of predictor variables was used to examine what is most predictive of each of the four factors/subscales of the CES-D at three months. Based on findings from the previous regression analysis, predictors included gender, history of depression, baseline hopelessness, and baseline depression. As shown in Table 9, female gender was a significant predictor for the mood/depressed affect factor. History of depression was a predictor for the somatic factor. Baseline hopelessness was a predictor for all four factors, while baseline depression was a predictor for the mood/depressed affect, somatic, and lack of well-being/positive affect factor. The models accounted for 40% of the variance in the somatic/vegetative factor, 6% of the variance in the interpersonal factor, 25% of

Table 8

Correlations between Antecedent Variables and Baseline Hopelessness Total Scores and
Baseline Depression Total Scores

Antecedent Variable	Correlation with Baseline Hopelessness Total Scores	Correlation with Baseline Depression Total Scores
Age (in years)	0.02	-0.01
Gender (1= male, 0= female)	-0.04	-0.17**
Race (1= Caucasian, 0= non-Caucasian)	-0.03	-0.07
Marital status (1= married, 0= non-married)	-0.17**	-0.15**
History of depression (1= yes, 0= no)	0.06	0.14**
History of heart attack (1= yes, 0= no)	0.03	0.02
Group assignment (1= intervention, 0= control)	0.05	0.02
Ejection fraction (in percent)	-0.13*	-0.01

Note. **p< .01, *p<.05

Table 9

Predictors of Three-month Depression Factors/Subscales

Variable	B	t	Tolerance
Interpersonal Factor			
Gender (1 = male, 0 = female)	0.10	1.08	0.97
History of depression (1 = yes, 0 = no)	0.08	1.35	0.98
Baseline hopelessness (Five-item BHS)	0.07	2.33*	0.73
Baseline depression (CES-D)	0.01	1.66	0.70
Model $R^2 = 0.06$ F of $R^2 = 5.05$ (4, 350), $p = 0.00$ Observed power = 1.0 Partial eta squared = 0.83			
Mood/Depressed Affect Factor			
Gender (1 = male, 0 = female)	-0.78	-2.30*	0.97
History of depression (1 = yes, 0 = no)	0.20	0.91	0.98
Baseline hopelessness (Five-item BHS)	0.57	4.73*	0.73
Baseline depression (CES-D)	0.19	9.61*	0.70
Model $R^2 = 0.42$ F of $R^2 = 62.22$ (4, 350), $p = 0.00$ Observed power = 1.0 Partial eta squared = 0.74			
<i>Note.</i> * $p < 0.05$ Five- item BHS = Five item Beck Hopelessness Scale® total score			

Table 9 (continued)

Variable	B	t	Tolerance
Somatic/Vegetative Factor			
Gender (1 = male, 0 = female)	-0.55	-1.42	0.97
History of depression (1 = yes, 0 = no)	1.01	4.06*	0.98
Baseline hopelessness (Five-item BHS)	0.43	3.09*	0.73
Baseline depression (CES-D)	0.22	9.63*	0.70
Model $R^2 = 0.40$ F of $R^2 = 57.48$ (4, 350), $p = 0.00$ Observed power = 1.0 Partial eta squared = 0.66			
Lack of Well-being/Positive Affect Factor			
Gender (1 = male, 0 = female)	-0.01	-0.06	0.97
History of depression (1 = yes, 0 = no)	0.23	1.41	0.98
Baseline hopelessness (Five-item BHS)	0.48	5.22*	0.73
Baseline depression (CES-D)	0.07	5.02*	0.70
Model $R^2 = 0.25$ F of $R^2 = 29.30$ (4,350)* Observed power = 1.0 Partial eta squared = 0.72			
<i>Note.</i> * $p < 0.05$ Five- item BHS = Five item Beck Hopelessness Scale® total score			

the variance in the lack of well-being/positive affect factor, and 42% of the variance in the mood/depressed affect factor. Analysis of unconstrained and constrained models showed that each individual predictor offered a significant contribution to the model. Residuals were fairly normally distributed. All tolerance levels were at an acceptable level, with tolerance levels for baseline depression and baseline hopelessness indicating mild collinearity (0.79 and 0.73 respectively in all four models). In each model the observed power was high (1.0), with moderate effect sizes in each model (0.66 to 0.83) (see Table 9).

In summary, there was a moderate correlation between hopelessness and depression, yet some distinction was evident between the two concepts. There was a moderate amount of variance not shared by the two variables. In addition, there was a portion of the sample that had either hopelessness symptoms but no symptoms of depression or depression symptoms but no symptoms of hopelessness. Finally, baseline hopelessness accounted for a small amount of variance in three-month depression.

Question #3: For those post-MI patients who have hopelessness symptoms at three-months after hospital discharge, what factors present at baseline are predictive of their three-month hopelessness scores?

Hierarchical regression was used to examine the linear relationship between antecedent patient factors and the hopelessness symptoms total score at three months, controlling for hopelessness symptoms at baseline. Although the hopelessness scale range is limited from one to five, theoretically the construct of hopelessness is continuous in nature and was analyzed as such (vonEye & Schuster, 1998). As illustrated in Table 10, a non-married status and history of depression were predictive of

Table 10

Predictors of Three-month Hopelessness Symptoms

Step	Variable	B	t	Tolerance
1				
	Age (in years)	-0.01	-1.23	0.89
	Gender (1 = male, 0 = female)	-0.04	-0.22	0.90
	Race (1 = Caucasian, 0 = non-Caucasian)	-0.06	-0.27	0.95
	Marital status (1 = married, 0 = non-married)	-0.67	-3.47*	0.90
	History of depression (1 = yes, 0 = no)	0.48	2.34*	0.95
	History of heart attack (1 = yes, 0 = no)	0.18	0.94	0.94
	Group assignment (1 = intervention, 0 = control)	0.04	0.25	0.97
	Disease severity (reference = 0-35)			
	36 and above (1 = 36+, 0 = 0-35)	-0.01	-0.03	0.56
	No EF information (1 = no EF, 0 = 0-35)	0.10	0.32	0.58
Model R ² = 0.07				
F of R ² = 2.70 (9, 344), p = 0.00				
Observed power = 0.99				
Partial eta squared = 0.86				

Note. *p < 0.05

Table 10 (continued)

Step	Variable	B	t	Tolerance
2				
	Age (in years)	-0.01	-1.65	0.89
	Gender (1 = male, 0 = female)	-0.09	-0.60	0.90
	Race (1 = Caucasian, 0 = non-Caucasian)	0.01	0.05	0.95
	Marital status (1 = married, 0 = non-married)	-0.34	-2.15*	0.88
	History of depression (1 = yes, 0 = no)	0.10	0.58	0.93
	History of heart attack (1 = yes, 0 = no)	-0.05	-0.32	0.93
	Group assignment (1 = intervention, 0 = control)	-0.11	-0.85	0.96
	Disease severity (reference = 0-35)			
	36 and above (1 = 36+, 0 = 0-35)	0.15	0.76	0.56
	No EF information (1 = no EF, 0 = 0-35)	0.25	0.97	0.58
	Baseline hopelessness (Five-item BHS total)	0.61	13.74*	0.92
Model $R^2 = 0.40$ F of $R^2 = 22.68$ (10, 344), $p = 0.00$ Observed power = 0.99 Partial eta squared = 0.99				

Note. * $p < 0.05$

BHS = Beck Hopelessness Scale®

hopelessness symptoms at three months in step one of the model. Step one of the model was significant but accounted for only 7% of the variance in three-month hopelessness symptoms. An examination of the unconstrained and constrained models showed that each predictor offered a significant contribution to the model and residuals were fairly normally distributed. All tolerance levels were at an acceptable level (with the exception of the dummy coded ejection fraction variables). Observed power was high and there was a large effect size (see Table 10).

Step two of the model added baseline hopelessness, which was found to be a significant predictor of hopelessness at three months. Non-married status also remained a predictor, while history of depression was no longer a significant predictor in this step of the model. Step two of the model was significant and explained 40% of the variance in three-month hopelessness. Review of unconstrained and constrained models indicated that each predictor offered a significant contribution to the model. Examination of residuals showed fairly normal distributions and all tolerance levels remained at an acceptable level. Observed power remained high and there continued to be a large effect size (see Table 10). In summary, a non-married status was the only factor predictive of hopelessness symptoms at three-months in this study.

Question #4: Are hopelessness symptoms at baseline predictive of participation in cardiac rehabilitation exercise and physical functioning among post-MI patients at three-months after hospital discharge?

Cardiac rehabilitation exercise participation. Subjects responded to a series of questions about physician recommendation and follow-through regarding participation in cardiac rehabilitation exercise. These responses were divided into five categories for both

hospital- and home-based exercise (see Table 11). A total of 56% of subjects ($n = 194$) reported that hospital-based exercise was not recommended to them by their physician, while approximately 30% of subjects ($n = 106$) stated that home-based exercise was not recommended. Of the 153 subjects who reported receiving a referral for hospital-based exercise, 63% of these ($n = 96$) actually started a hospital-based exercise program (i.e. were either currently attending, had completed, or quit the program early). Participation in a hospital-based exercise program was self-reported and was not validated. Of the 244 subjects who reported receiving a referral for a home-based exercise program, 88% of these ($n = 214$) followed through and started a home-based program (i.e. were currently attending, had completed, or quit the program early). Approximately 10% ($n = 24$) of those who reported a referral to home-based exercise stated that they “completed” the program or “quit early”, when home based exercise is typically recommended as a permanent lifestyle change. Participation in home-based exercise was self-reported and could not be validated. As seen in a cross-tabulation analysis of the cardiac rehabilitation exercise data (Table 12), hospital- and home-based exercise were not mutually exclusive. A proportion of subjects indicated participation in both exercise programs. A proportion of subjects also did not participate in either type of exercise program.

The extent to which hopelessness symptoms at baseline predict cardiac rehabilitation exercise participation at three months was examined using multinomial logit regression. A multinomial regression model was selected because there was no ordering to the values of exercise participation. Participation in both a reported physician-recommended hospital-based exercise program and in a reported physician-recommended home-based exercise programs was examined. Categories of participation in a hospital-

Table 11

Participation in Hospital- and Home-based Cardiac Rehabilitation Exercise Programs

Categories of participation	Hospital-based cardiac rehabilitation exercise program (n = 348)	Home-based cardiac rehabilitation exercise program (n = 350)
	n (%)	n (%)
Recommended by physician and currently attending	47 (13.5)	190 (54.3)
Recommended by physician and completed	36 (10.3)	8 (2.3)
Recommended by physician but quit early	13 (3.7)	16 (4.6)
Recommended by physician but not started	57 (16.4)	30 (8.6)
Not recommended by physician	195 (56.0)	106 (30.3)

Table 12

Cross-tabulation of Number of MI Patients who Participated in Hospital- and Home-based Cardiac Rehabilitation Exercise at Three

Months after Hospital Discharge (n = 347)

Participation in hospital- based cardiac rehabilitation exercise		Participation in home-based cardiac rehabilitation exercise					Total
		Currently attending	Completed	Quit early	Did not start	Not recommended	
	Currently attending	30	0	0	2	15	47
	Completed	20	4	1	4	7	36
	Quit early	8	0	1	0	4	13
	Did not start	34	0	2	6	15	57
	Not recommended	96	4	11	18	65	194
Total		188	8	15	30	106	347

Note. rehab = rehabilitation; currently attending= recommended by physician and currently participating in the program; completed= recommended by physician and completed or stopped the program; quit early= recommended by physician and quit the program early; did not start= recommended by physician but did not start the program; not recommended= exercise program was not recommended by physician

and home-based cardiac rehabilitation exercise program included: 1) current participation in a physician-recommended exercise program; 2) completion of a physician-recommended exercise program; 3) starting a physician-recommended exercise program, but quitting it early; 4) not ever starting an exercise program that had been recommended by a physician; and 5) no physician recommendation received for an exercise program. Current participation in a physician-recommended exercise program was used as the reference category in the two regression models. Baseline hopelessness symptoms were entered as a covariate in the models. To further examine the distinction of hopelessness and depression symptoms, baseline depression symptoms were also entered as a covariate in the model.

Participation in hospital-based exercise was examined first. As shown in Table 13, subjects with increased levels of baseline hopelessness symptoms were 1.57 times more likely to never start a physician-recommended hospital-based exercise program than to be currently attending a program at three months after hospital discharge. Additionally, subjects with increased levels of baseline hopelessness symptoms were 1.6 times more likely to quit a recommended hospital-based exercise program early. In contrast, baseline depression symptoms were not predictive of any of the hospital-based exercise categories in this model. Goodness of fit tests showed that the model adequately fit the data and likelihood ratio tests indicated that the effect of baseline hopelessness significantly contributed to the model ($\chi^2 = 12.33$, $df = 4$, $p = 0.02$).

As illustrated in Table 14, there were no statistically significant findings related to baseline hopelessness symptoms as a predictor of participation in a home-based cardiac rehabilitation exercise program. However, one value that approached significance should

Table 13

Predictors of Three-month Hospital-based Cardiac Rehabilitation Exercise Participation

Dependent Variable: Hospital-Based Cardiac Rehabilitation Exercise Participation at
Three Months after Hospital Discharge (n = 348)

Exercise Categories (reference category: currently attending)	Predictors	Adjusted OR	95% CI	p values
Completed a recommended program	Hopelessness	1.10	0.77-1.57	0.614
	Depression	1.02	0.96-1.07	0.550
Quit a recommended program early	Hopelessness	1.60	1.01-2.55	0.046
	Depression	1.01	0.94-1.09	0.754
Program was recommended, but did not start	Hopelessness	1.57	1.15-2.14	0.005
	Depression	1.01	0.96-1.05	0.851
Program was not recommended	Hopelessness	1.17	0.89-1.53	0.258
	Depression	1.00	0.96-1.04	0.934

Note. hopelessness = baseline hopelessness symptoms; depression = baseline depression symptoms; OR = odds ratio; CI = confidence interval

Table 14

Predictors of Three-month Home-based Cardiac Rehabilitation Exercise Participation

Dependent Variable: Home-Based Cardiac Rehabilitation Exercise Participation at Three Months after Hospital Discharge (n = 350)				
Exercise Categories (reference category: currently attending)	Predictors	Adjusted OR	95% CI	p values
Completed a recommended program	Hopelessness	1.08	0.63-1.85	0.779
	Depression	1.00	0.92-1.09	0.999
Quit a recommended program early	Hopelessness	0.96	0.64-1.44	0.841
	Depression	1.01	0.95-1.07	0.734
Program was recommended, but did not start	Hopelessness	1.03	0.76-1.38	0.870
	Depression	1.00	0.95-1.05	0.965
Program was not recommended	Hopelessness	1.17	0.98-1.40	0.080
	Depression	1.01	0.98-1.04	0.616

Note. hopelessness = baseline hopelessness symptoms; depression = baseline depression symptoms; OR = odds ratio; CI = confidence interval

be mentioned. Those subjects with increased levels of baseline hopelessness symptoms showed more of a tendency to report not receiving a physician recommendation for home-based exercise than to be currently participating in a home-based exercise program at three months after hospital discharge ($p = 0.08$). There were no significant findings related to baseline depression symptoms and home-based exercise participation categories. Goodness of fit tests showed that the model adequately fit the data.

Physical functioning. Physical functioning was measured at three months after hospital discharge using the Activity Status Index (ASI). Physical functioning was used as a dependent variable in the study. A composite score for the ASI can range from 0 (low) to 58.2 (high). As seen in Table 3, the average physical functioning score was 25.2 ($SD = 17.4$), which reflects a fairly high functioning level as compared to previous research with CHD patients (Hlatky et al., 1989; Hlatky, et al., 1997; Rankin, 2002).

There was a weak (defined as $r < 0.30$) negative correlation between baseline hopelessness and three-month physical functioning ($r = -0.29$) and a moderately strong negative correlation between three-month hopelessness and three-month physical functioning ($r = -0.32$) (see Table 5). Physical functioning at three months was also moderately negatively correlated with depression at baseline and three months ($r = -0.36$ and -0.48 respectively).

The linear relationship between hopelessness symptoms at baseline and physical functioning at three months was evaluated using hierarchical regression. Antecedent variables were entered in step one of the model. Baseline hopelessness symptoms were added in step two. To further examine the distinction between hopelessness and depression, baseline depression symptoms were added in step three of the model.

As depicted in Table 15, increased age, female gender, history of depression, and history of a prior MI were all significant predictors of decreased physical functioning at three months in step one, two, and three of the model. An increased level of baseline hopelessness was a significant predictor of decreased physical functioning at three months in step two of the model and remained a significant predictor in step three. Increased level of baseline depression symptoms was a significant predictor of decreased physical functioning at three months in step three of model. Step one of the model accounted for 25% of the variance, while the addition of baseline hopelessness in step two increased the explanation of variance to 29%. The addition of depression symptoms in step three of the model increased the explanation of variance further to 32%. All steps of the model were significant. Review of unconstrained and constrained models showed that each individual predictor offered a significant contribution to the model.

Examination of residuals showed fairly normal distribution in all models. Tolerance levels for baseline hopelessness and baseline depression were 0.70 and 0.67 respectively, indicating mild collinearity of the two variables with other independent variables in the model. Tolerance levels for all other variables were appropriate. Observed power was high (0.82) in step one of the model, but decreased in steps two and three to 0.41 and 0.32 respectively. However, there was a large effect size in all three models (see Table 15).

In summary, baseline hopelessness symptoms were predictive of subjects never starting a physician-recommended hospital-based exercise program and were also predictive of subjects quitting a hospital-based program early. Hopelessness symptoms

Table 15

Predictors of Three-Month Physical Functioning

Step	Variable	B	t	Tolerance
1				
	Age (in years)	-0.36	-4.86*	0.89
	Gender (1 = male, 0 = female)	8.43	4.64*	0.90
	Race (1 = Caucasian, 0 = non-Caucasian)	2.99	1.26	0.95
	Marital status (1 = married, 0 = non-married)	2.34	1.21	0.90
	History of depression (1 = yes, 0 = no)	-9.54	-4.62*	0.95
	History of heart attack (1 = yes, 0 = no)	-5.67	-3.04*	0.94
	Group assignment (1 = intervention, 0 = control)	-2.13	-1.27	0.97
	Disease severity (reference = 0-35)			
	36 and above (1 = 36+, 0 = 0-35)	4.35	1.77	0.56
	No EF information (1 = no EF, 0 = 0-35)	2.09	0.66	0.58
Model $R^2 = 0.25$				
F of $R^2 = 12.10$ (9, 344), $p = 0.00$				
Observed power = 0.82				
Partial eta squared = 0.77				

Note. * $p < 0.05$

Table 15 (continued)

Step	Variable	B	t	Tolerance
2				
	Age (in years)	-0.37	-4.97*	0.89
	Gender (1 = male, 0 = female)	8.63	4.89*	0.90
	Race (1 = Caucasian, 0 = non-Caucasian)	2.70	1.16	0.95
	Marital status (1 = married, 0 = non-married)	0.97	0.51	0.88
	History of depression (1 = yes, 0 = no)	-7.95	-3.91*	0.93
	History of heart attack (1 = yes, 0 = no)	-4.76	-2.61*	0.93
	Group assignment (1 = intervention, 0 = control)	-1.49	-0.91	0.96
	Disease severity (reference = 0-35)			
	36 and above (1 = 36+, 0 = 0-35)	3.71	1.55	0.56
	No EF information (1 = no EF, 0 = 0-35)	1.50	0.49	0.58
	Baseline hopelessness (Five-item BHS total)	-2.52	-4.65*	0.92
Model $R^2 = 0.29$ F of $R^2 = 13.73$ (10, 344), $p = 0.00$ Observed power = 0.41 Partial eta squared = 0.95				

Note. * $p < 0.05$

BHS = Beck Hopelessness Scale®

Table 15 (continued)

Step	Variable	B	t	Tolerance
3				
	Age (in years)	-0.38	-5.13*	0.89
	Gender (1 = male, 0 = female)	7.55	4.31*	0.88
	Race (1 = Caucasian, 0 = non-Caucasian)	2.03	0.89	0.94
	Marital status (1 = married, 0 = non-married)	0.72	0.39	0.87
	History of depression (1 = yes, 0 = no)	-6.39	-3.14*	0.89
	History of heart attack (1 = yes, 0 = no)	-4.74	-2.66*	0.93
	Group assignment (1 = intervention, 0 = control)	-1.48	-0.92	0.96
	Disease severity (reference = 0-35)			
	36 and above (1 = 36+, 0 = 0-35)	3.80	1.62	0.56
	No EF information (1 = no EF, 0 = 0-35)	0.60	0.20	0.58
	Baseline hopelessness (Five-item BHS total)	-1.35	-2.22*	0.70
	Baseline depression (CES-D total)	-0.38	-3.89*	0.67
Model $R^2 = 0.32$ F of $R^2 = 14.38$ (11, 344), $p = 0.00$ Observed power = 0.32 Partial eta squared = 1.0				

Note. * $p < 0.05$

BHS = Beck Hopelessness Scale®; CES-D = Center for Epidemiologic Studies-Depression Scale

also accounted for a significant amount of variance in predicting decreased physical functioning.

In conclusion, the results of the study have been presented in this chapter. Study findings have shown a relationship between hopelessness and depression symptoms, but also some distinction between the two concepts. Both hopelessness and depression symptoms were found to be prevalent and moderate to severe in a portion of the sample in the early stages of the post-MI recovery period. Depression symptoms significantly decreased from baseline to three months after hospital discharge whereas hopelessness symptoms did not. A strong correlation was identified between symptoms of hopelessness and depression at three months after hospital discharge. However, a small percentage of subjects were identified who had symptoms of hopelessness but little or no symptoms of depression. There was an additional small percentage of subjects who had symptoms of depression but little or no hopelessness. In addition, baseline hopelessness accounted for a small amount of variance in three-month depression. Predictors of hopelessness symptoms were also examined and a non-married status was found to be a significant predictor of hopelessness at three months, but marital status was not predictive of depression at three months. Finally, the effect of hopelessness symptoms on select patient outcomes was examined. Increased baseline hopelessness symptoms were predictive of not starting a hospital-based cardiac rehabilitation exercise program and of quitting a hospital-based program early, whereas depression had no such effect. Additionally, both hopelessness and depression symptoms at baseline accounted for independent proportions of variance in physical functioning at three months. In Chapter 6

an interpretation of the study findings, study limitations and implications for nursing research and practice will be presented.

Chapter 6

DISCUSSION

Depression and CHD are rightfully identified as public health priorities by the World Health Organization (2001) and the National Institute of Mental Health (2002). The presence of depression symptoms after a CHD event is well documented (Ariyo et al., 2000; Frasure-Smith et al., 1993; Travella et al., 1994). However, the complex relationship between CHD and other psychological factors is not fully understood. Hopelessness has been associated with depression in individuals coping with a variety of physical illnesses (Brietbart et al., 2000; Cochinov et al., 1998; Lewis et al., 2001; Northouse et al., 1995; Northouse et al., 2001; VanServellen et al., 1996; Watson et al., 1999). However, there has been minimal research done to describe hopelessness in individuals with CHD.

This descriptive study was designed to describe symptoms of hopelessness and depression following a MI, the relationship between hopelessness and depression symptoms, predictors of hopelessness symptoms, and how symptoms of hopelessness might affect cardiac rehabilitation exercise participation and physical functioning post-MI. This chapter will present an interpretation of the study findings, study limitations and implications for nursing research and practice.

Frequency and Severity of Hopelessness and Depression Symptoms

This study examined the frequency and severity of hopelessness and depression symptoms in patients following a MI. Similar to findings in the literature (Ariyo et al., 2000; Barefoot et al., 2000; Bush et al., 2001; Frasure-Smith et al., 2000), depression symptoms were frequent and moderate to severe in a portion of this sample of post-MI

patients. Also similar to reports in the literature (Frasure-Smith et al.; Hance et al., 1996; Travella et al., 1994), depression symptoms in this study significantly decreased from baseline (i.e. average 14 days) to three months after hospital discharge. While 32% of subjects reported a CES-D total score of 16 or greater at baseline, this decreased to 23% at three months. The percentage of subjects with depression symptoms at three months post-MI (23%) still remained above what is typically seen in American men (7%) and women (12%) in the general population (NIMH, 2002).

Examination of the CES-D factors/subscales from baseline to three months showed a significant decrease in two factors, namely the somatic factor and mood/depressed affect factor. The high frequency and severity of somatic symptoms at baseline likely reflect the physical signs and symptoms experienced by many post-MI patients (e.g. lack of appetite, difficulty sleeping, difficulty concentrating, lack of energy, etc.). These somatic symptoms are often secondary to side effects from new medications or related to activity restrictions in the early post-MI recovery period. The high frequency and severity of depressed mood symptoms at baseline likely reflects a grief response that can occur in reaction to a cardiac diagnosis and experience of hospitalization. A decrease in somatic symptoms at three months may be related to the common removal of activity restrictions approximately 4-6 weeks post-MI, an improved response to increased activity and exercise, and adaptation to medications. The resolution of mood symptoms may be related to a reduction in grief and fear as physical symptoms resolve and the individual returns to work or other previous activities of daily living.

Research findings over the past five years indicate a prevalence of mild to severe hopelessness in physically ill populations, including patients with stroke (Lewis et al., 2001), hypertension (Everson et al., 2000), cancer (Brietbart et al., 2000; Northouse et al., 2001; Northouse et al., 2002; Watson et al., 1999), and those who are generally medically ill (Menon et al., 2000). No previous research was found examining the frequency and severity of hopelessness after a MI. In this post-MI sample, hopelessness symptoms were prevalent and moderate to severe in a portion of subjects at both baseline and three months after hospital discharge. The average hopelessness total score at baseline was 1.6 ($SD = 1.5$) and did not significantly decrease at three months ($M = 1.5$, $SD = 1.6$) ($t = 0.95$, $df = 350$, $p = 0.34$). While 26% of subjects reported a baseline hopelessness total score of 3.0 or greater at baseline, this only decreased to 23% at three months.

In contrast to depression, there was a persistence of moderate to severe hopelessness symptoms in approximately one-quarter of the subjects at three months post-MI. This persistence in hopelessness reflects an ongoing negative outlook and sense of helplessness toward the future. The future likely remains uncertain for many MI patients who are faced with a new cardiac diagnosis, a number of recommended lifestyle changes, and an uncertain prognosis (i.e. state hopelessness). Although a MI typically heals by three months and patients have typically returned to work and other previous activities, most patients continue to be faced with changes related to diet modifications, exercise, weight loss, smoking cessation, stress reduction, and medication adherence. A number of individuals may continue to struggle with these lifestyle changes, including being less successful with the changes than they had hoped, leaving them with thoughts and feelings of hopelessness. The persistence in hopelessness may also reflect a

patient's habitual outlook toward many areas of life (i.e. trait hopelessness). However, state hopelessness could not be differentiated from trait hopelessness in this study due to the absence of data related to hopelessness symptoms before the MI.

Relationship between Hopelessness and Depression Symptoms

The relationship between hopelessness and depression symptoms in the early recovery period after a MI was investigated. Findings were similar to earlier reports in the literature which have found hopelessness related to depression, yet distinct in some respects from depression. In past research, hopelessness was found to increase vulnerability to a subtype of depression (i.e. hopelessness depression) (Alloy et al., 1999; Joiner et al., 2001). Hopelessness has also been identified as a mediator between depression symptoms and social support (Johnson et al., 2001). Symptoms of hopelessness and depression have been related to suicidal ideation in medically ill individuals (Cochinov et al, 1998) and psychiatric patients (Beck et al., 1993); however, symptoms of hopelessness have been found to be a more important and independent predictor of suicide than depression (Beck et al.; Cocchinov et al.). Hopelessness has predicted desire for hastened death, independent of depression (Brietbart et al., 2000) and has been found to be related to long-term survival, independent of depression (Lewis et al., 2001). Finally, hopelessness has been found predictive of hypertension, after adjusting for depression and CHD risk factors (Everson et al., 2000).

No previous research was found examining the relationship between hopelessness and depression symptoms in post-MI patients over time. In this post-MI sample, hopelessness symptoms were found to be moderately correlated to depression symptoms at baseline ($r = .52$), yet more strongly correlated to depression symptoms at three months

($r = .65$). It may be that hopelessness symptoms are more strongly related to persistent symptoms of depression, than depression symptoms of a transient nature. Hopelessness symptoms may also have a tendency to be more strongly related to depression symptoms over time, or to lead to depression symptoms (i.e. hopelessness depression) over time, as is hypothesized by the conceptual model for the current study (Abramson et al., 1989). Further examination of the relationship between hopelessness and depression symptoms found that baseline hopelessness symptoms accounted for an additional 5% of variance in three month depression symptoms, after controlling for antecedent variables and baseline depression symptoms. This small amount of variance was evident despite small correlations that existed between the antecedent variables and baseline hopelessness symptoms (see Table 8).

Of the total sample of post-MI patients in this study, 10% had a moderate to severe level of hopelessness symptoms while having minimal or no symptoms of depression at three months post-MI. These subjects had minimal or no depressed mood or somatic symptoms, yet had negative expectations and a sense of helplessness toward their future. Another portion of the sample (10%) had a moderate to severe level of depression symptoms, but minimal or no hopelessness symptoms at three months post-MI. These subjects exhibited depressed mood and somatic symptoms, yet had no or little helplessness or negative expectancy toward their future. This supports previous research where hopelessness symptoms were found to be independent of depression symptoms (Barefoot et al., 2000; Cochinov et al., 1998; Everson et al., 1996). Yet, 13% of the sample exhibited symptoms of both hopelessness and depression. These subjects expressed depressed mood, somatic symptoms, helplessness and negative expectancy

toward their future. These findings support previous research suggesting that hopelessness can lead to a sub-type of depression (i.e. hopelessness depression) (Alloy et al., 1999; Alloy & Clements, 1998; Alloy, Just & Panzarella, 1997; Joiner, 2001; Joiner, et al., 2001) and may at times occur in conjunction with depression (Abramson et al., 1989). Finally, of the total sample, 67% had neither depression nor hopelessness symptoms at three months.

Of some additional interest in this investigation, the hopelessness total score was only moderately correlated to the lack of hope item on the CES-D. This indicates that hopelessness and hope may not be polar opposites. These findings suggest that a reversed hope item on a larger depression tool may not be an appropriate proxy for hopelessness.

In summary, these findings suggest that a moderate to strong relationship is present between hopelessness and depression symptoms in the early recovery period after a MI; however, some distinction between the two variables exists. Further examination of the distinction between the two variables was done by analyzing the predictors of hopelessness and depression symptoms and will be presented next. The outcomes of both hopelessness and depression symptoms were also examined and will be discussed.

Predictors of Hopelessness Symptoms

This study examined age, gender, race, marital status, history of depression, history of prior MI, study group assignment, and disease severity as potential predictors of hopelessness symptoms at three months. No previous research was found examining any of these variables as antecedents to hopelessness. In the current study, a non-married status (i.e. divorced, separated, widowed, or never married) was the only predictor of hopelessness symptoms at three months, when controlling for baseline hopelessness.

Married individuals may be more likely to have other people in their home who they feel responsible for and therefore have a greater sense of purpose and control in their life. Married people may also have greater access to support (e.g. emotional, social, physical, and economic) thus promoting a more positive expectation of the future. Previous research with heart failure patients has shown that family involvement in patient education and counseling improves understanding of recommended treatment regimens and adherence to regimens, especially among those who are married (Ni, Nauman, Burgess, Wise, Crispell, & Hershberger, 1999).

In contrast to the study findings related to marital status and hopelessness symptoms, marital status was not predictive of depression symptoms at three months post-MI. The only predictor of three-month depression symptoms was a history of depression. This finding supports previous research that has found depression history related to increased symptoms of depression after a CHD event (Lesperance et al., 1996). In summary, the results of the current study identified different predictors for three-month hopelessness and depression symptoms, offering some evidence of a distinction between hopelessness and depression symptoms post-MI.

Effects of Hopelessness on Exercise Participation and Physical Functioning

Exercise participation. A physician referral is needed for a patient to begin a hospital-based cardiac rehabilitation exercise program. Approximately 44% of the subjects in this study reported receiving such a referral, while approximately 28% of the total subjects reported having started a hospital-based exercise program at three months. However, thirteen subjects who started a hospital-based exercise program quit the program “early”, making for a participation rate of approximately 27%. This is higher

than participation rates found in earlier studies (11 to 21%) (Ades et al., 1999; Blackburn et al., 2000), although the current study's data was self-reported and could not be validated.

Baseline hopelessness was examined in this study as a predictor of participation in hospital-based cardiac rehabilitation exercise at three months. The current study found that subjects with increased levels of baseline hopelessness symptoms were approximately one and a half times more likely to never start a recommended hospital-based exercise program than to be currently attending a program at three months. Subjects were also approximately one and a half times more likely to quit a hospital-based exercise program early than to be currently attending a program at three months. This finding supports related research where attitude and perceived control have explained a proportion of variance in exercise intention and adherence in patients attending a hospital-based cardiac rehabilitation program (Blanchard et al., 2003). Hopeless individuals have a negative attitude toward the future and perceive little control in changing the future. It may be that a hospital-based cardiac rehabilitation exercise program is perceived as requiring too much time, effort, and cost to a hopeless person who is already feeling pessimistic about the future and helpless in changing future outcomes. In addition, a hopeless individual may feel more helpless in a structured group setting where they might be compared to others' achievements and outcomes.

Baseline depression was also examined as a predictor of hospital-based exercise participation in this study. Baseline depression was not predictive of hospital-based exercise participation in this sample, which contradicts previous research findings (Glazer et al., 2002; Ziegelstein et al., 2000). The current findings showing hopelessness

symptoms, but not depression symptoms, as predictive of participation in hospital-based exercise suggest some differentiation of hopelessness and depression symptoms post-MI.

Home-based cardiac rehabilitation exercise programs have become increasingly popular in recent years due to cost and time constraints. In spite of the growing popularity, participation in home-based cardiac rehabilitation exercise has not been widely studied. Approximately 70% of subjects in this study reported receiving a physician referral for a home-based exercise program, while 61% of the total sample reported having started such a program. A greater percentage of patients reported receiving a referral for home-based exercise (70%) as compared to a referral to a hospital-based exercise program (44%). Although these referrals could not be validated, it is likely that physicians were making more referrals to home-based exercise due to a variety of factors, including cost to the patient, time constraints, and driving distance to a hospital-based exercise facility. More patients also followed through on a referral to home-based exercise than a referral to a hospital-based program likely due the convenience and low cost associated with a home-based exercise program.

The current study did not find either hopelessness or depression symptoms as predictive of home-based exercise participation. This contradicts one literature source that suggested depression symptoms as being negatively related to home-based exercise participation (Ziegelstein et al.). However, findings in the current study suggested that subjects with increased levels of baseline hopelessness symptoms may have less of a tendency to receive a physician recommendation for home-based exercise than to be currently participating in a home-based exercise program three months post-MI. This may be related to a hopeless person not hearing or understanding a referral for home-

based exercise. It may also be due to a physicians' hesitancy to recommend home exercise when an individual is already expressing a negative attitude about the future and expressing little perceived control in changing the future.

Physical functioning. The present study examined baseline hopelessness symptoms as predictive of physical functioning at three months. No research has been found examining the relationship between hopelessness and physical functioning in a CHD population. In the current study, the average physical functioning score ($M = 25.2$, $SD = 17.4$) indicated a moderately high level of physical functioning post-MI as compared to previous studies with CHD patients (Hlatky et al., 1989; Hlatky, et al., 1997; Rankin, 2002). In the present study, baseline hopelessness symptoms were a significant predictor of decreased physical functioning at three months, explaining 4% of the variance in physical functioning beyond what was already accounted for by antecedent patient factors. This small amount of variance was significant despite the fact that there were small correlations between baseline hopelessness symptoms and antecedent variables (see Table 8). Although small, the proportion of variance in physical functioning accounted for by hopelessness symptoms supports previous cross-sectional research that found hopelessness symptoms associated with decreased physical functioning in men with cancer and AIDS (VanServellen et al., 1996).

Baseline depression symptoms explained an additional small amount of variance (3%) in physical functioning, after controlling for symptoms of baseline hopelessness. This is in agreement with previous findings in the literature that have identified increased depression as related to decreased physical functioning (Blumenthal et al., 1997) and decreased aerobic capacity (Glazer et al., 2002). Although the additional variance in

physical functioning explained by depression symptoms beyond what was already explained by hopelessness was small, it further supports some distinction between hopelessness and depression symptoms in this post-MI sample.

Limitations

While this study contributes to an improved understanding of hopelessness and depression symptoms post-MI, the findings from this study must be considered in association with the study limitations. It is recognized that the use of the complete 20-item Beck Hopelessness Scale® (BHS®) (Beck et al., 1974) may have been optimal for the study. However, it was determined that the addition of 15 more items to an already lengthy battery of tests would potentially create excessive burden for study participants. The reliability of the BHS® cognitive expectations factor was closely examined during this study and deemed acceptable (see the instruments section of Chapter 4). Thus, the five-item BHS® cognitive expectations factor may have potential as a screening tool for hopelessness symptoms in the CHD population. The validity of the cognitive expectations factor of the BHS® was also previously unknown, and was not determined in this study. This is recognized as a limitation.

The instrument used to measure participation in cardiac rehabilitation exercise must also be mentioned as a study limitation. Although the instrument measured exercise participation in those subjects who had received a physician referral for exercise, the instrument did not examine exercise participation for those subjects who did not get a physician referral. It is likely that little information would have been gained regarding hospital-based exercise participation in that a hospital-based program requires a physician referral. However, important information may have been gained regarding those subjects

participating in a home-based exercise program who reported no physician referral, as this type of exercise can be done without physician recommendation. In addition, the cardiac rehabilitation exercise tool included the category, “completed a home-based exercise program”. Home-based exercise is considered a permanent lifestyle change and so completion of home-based exercise is essentially identical to another category, “quitting the exercise early”. Reliability and validity of the cardiac rehabilitation exercise tool is unknown, and this is recognized as a limitation to the study.

Of the 721 subjects who consented and were enrolled in the HARP study, only 513 subjects with ACS completed baseline interviews and 431 completed three month interviews. Although the demographics were similar in these groups, there was a significant decrease in mean age from the enrollment sample to baseline sample. This attrition and difference in age is recognized as a limitation. Consequently, study results may not be generalizable to those MI patients over 65 years of age.

Direct Implications for Future Nursing Research

Despite its limitations, this study has important implications for future nursing research. This is the first known study to examine hopelessness symptoms in the early recovery period after hospitalization for MI. Study results can serve as a catalyst for future hopelessness research with MI populations.

Frequency of hopelessness and depression symptoms. As expected, depression symptoms were frequent and severe at baseline in a portion of the sample and significantly decreased at three months. In particular, this study found significant reductions in the mood/depressed affect and somatic factor scores. Further research related to the frequency and severity of the four factors of the CES-D later in the MI

recovery period is warranted. Whether the mood/depressed affect and somatic factors continue to decrease beyond three months post-MI needs further investigation. Additional examination of the interpersonal and absence of well-being/positive affect factors and whether they persist, increase, or decrease beyond three months is also of interest.

In this post-MI sample, hopelessness symptoms were frequent and moderate to severe in a portion of the sample at baseline and did not significantly decrease at three months. These findings are consistent with the study's conceptual model based on the theory of hopelessness depression, which states that hopelessness can be prompted by a negative life event (Abramson et al., 1989). Further examination of hopelessness symptoms at later points in the post-MI recovery period is needed to determine if these symptoms remain constant, increase, or decrease beyond three months post-MI. In addition, a longitudinal analysis of the five-item hopelessness scale's individual items may provide further information as to whether it is the negative expectancy, helplessness expectancy, or some other unknown component of hopelessness that may be most persistent in the post-MI patient.

It is unknown in this study if hopelessness symptoms were present in some subjects prior to the MI. Earlier research has found hopelessness to be a predictor of fatal and nonfatal CHD (Anda et al., 1993; Barefoot et al., 2000; Everson et al., 1996). The differentiation of trait hopelessness from state hopelessness may help to explain the persistence of hopelessness in this sample. Because a tool is not currently available to assess trait versus state hopelessness, subjects would need to be asked about their history of specific hopelessness symptoms prior to the MI event, in addition to current symptoms of hopelessness. The development of an instrument to assess trait hopelessness would

include a history of negative and helplessness expectations, while current hopelessness symptoms would need to be examined to assess state hopelessness. It is recognized that a combination of both trait and state hopelessness may be present in some individuals.

This study used the cognitive expectations factor of the BHS® to assess hopelessness. The cognitive dimension is comprised of thoughts that include a dark, vague, or uncertain future and thoughts of helplessness. Future research with post-MI patients should also include the affective and motivational dimensions of the BHS®. The affective dimension consists of negative feelings about the future, including lack of hope, enthusiasm, or faith. The affective factor may prove to be more highly correlated with depression symptoms. The motivational dimension includes negative thoughts and feelings toward changing the future (Beck et al., 1974). The motivational dimension may better capture subjects' sense of helplessness, provide additional insight into exercise participation and physical functioning post-MI, and be more amenable to therapeutic interventions than the cognitive or affective dimensions.

Relationship between hopelessness and depression symptoms. This study found hopelessness symptoms to be moderately correlated to depression symptoms at baseline, yet more strongly correlated to depression symptoms at three months. Hopelessness symptoms were most highly related to the mood/depressed affect factor of the CES-D at three months, despite a significant reduction in the mood/depressed affect factor from baseline to three months but no significant decrease in hopelessness symptoms over this same period of time. Additionally, baseline hopelessness accounted for an additional 5% of the variance in three month depression, after controlling for antecedent variables and baseline depression. These findings suggest that although a relationship exists between

hopelessness and depression symptoms post-MI at three months after hospital discharge, some distinction between the two variables is present. It is expected that a moderate to strong correlation, with some distinction between the two concepts, would continue further into the post-MI recovery period and this requires further research. It is also hypothesized that hopelessness may lead to depression in some individuals, versus depression leading to hopelessness. However, the nature of the relationship between hopelessness and depression symptoms cannot be established by regression techniques. In addition, the presence of mild multicollinearity with hopelessness and depression symptoms should be controlled in future investigations. The nature of the relationship between the two concepts would be better analyzed longitudinally using more extensive modeling techniques, which could also better control for collinearity.

Of the total sample of post-MI patients in this study, 10% had a moderate to severe level of hopelessness symptoms, yet had minimal or no symptoms of depression. Similarly, another 10% of the sample had a moderate to severe level of depression symptoms, but minimal or no hopelessness symptoms. It is unknown if these differences between hopelessness and depression symptoms continue, decrease, or increase later in the post-MI recovery period. Additional research is needed to assess these differences beyond three months.

The current study did not find a strong correlation between the five-item hopelessness total score and a reverse-scored hope item from the depression scale. This finding would discourage the use of a reversed hope item as a substitute for hopelessness in a CHD population. Future research related to hopelessness and hope variables in the MI population would be of interest. Examination of the affective and motivational

dimensions of hopelessness may better assess subjects' negative feelings about the future and sense of helplessness. The affective factor of the BHS® includes a lack of hope item. In addition, the examination of other variables similar to hopelessness is warranted, including pessimism or the absence of optimism, and perceived locus of control.

Predictors of hopelessness symptoms. In the current study, a non-married status was a predictor of hopelessness symptoms at three months. This relationship should be examined at later points in the recovery period. Additionally, further specification of non-married status is needed (i.e. widowed, divorced, separated, never married) using a larger sample size with larger marital status sub-groups. It is not known which non-married status might increase hopelessness symptoms or how a non-married status increases hopelessness symptoms. Therefore, other related variables warrant investigation, including presence of others in the home, presence of others in one's life to assist with caregiving, and social support.

Although a number of antecedent variables were evaluated as predictors of hopelessness, whether or not these antecedent variables are predictive of hopelessness symptoms further in the recovery period is unknown and warrants further investigation. Other possible predictors should also be examined in future research, including educational level, employment status, smoking history, alcohol history, illicit drug use history, medication history, and co-morbid health conditions. The effect of antecedents on all dimensions of hopelessness is warranted, including cognitive, affective, and motivational dimensions.

Hopelessness as a predictor of outcomes. The current study found that subjects with increased levels of baseline hopelessness symptoms were approximately one and a

half times more likely to never start a recommended hospital-based cardiac rehabilitation exercise program than to be currently attending a program at three months. Subjects were also approximately one and a half times more likely to quit a hospital-based exercise program early. It may be that a hospital-based cardiac rehabilitation exercise program is perceived as requiring too much time, effort, and cost to a hopeless person who is already feeling pessimistic about the future and helpless in changing future outcomes. In addition, a hopeless individual may feel more helpless in a structured group setting where they might be compared to others' achievements and outcomes. Additional research is needed to examine the potential effect of hopelessness symptoms on participation in hospital-based cardiac rehabilitation exercise, especially related to perceived barriers to hospital-based exercise and patient's thoughts related to a group exercise setting. Ongoing encouragement from a health care provider should also be assessed to determine the impact that this may have on a patient quitting a hospital-based program early.

Results from the current study also suggested that subjects with increased hopelessness symptoms reported lower physician recommendation for home-based cardiac rehabilitation exercise. Further research is warranted to evaluate how hopelessness symptoms might affect the patient-physician interaction. In particular, both patient and physician perceptions of a recommendation and the differentiation of a physician's "order" for a hospital- or home-based exercise program versus the physician's level of encouragement to attend such programs would be of interest. A recommendation to start a home-based exercise program also needs further investigation, including an assessment of participation in a home-based program beyond three months.

Future research is also needed to identify other variables that may impact a MI patient's decision to participate in a hospital- or home-based exercise program. Other potential predictors include psychological, social, economic, agency/system, and health-illness variables. Although depression symptoms were not found predictive of hospital- or home-based exercise in this study, further research is needed to validate these findings.

A valid and reliable tool is needed for future research of hospital- and home based cardiac rehabilitation exercise participation. Because hospital- and home-based exercise programs differ in several respects, two different tools may be needed. These tools must capture the initial recommendation for exercise by a health care provider, including the strength of this recommendation. They must also capture ongoing encouragement by a health care provider in addition to ongoing encouragement and support by the post-MI patient's significant others. Barriers to participation in exercise must be identified, including psychological, social, economic, agency/system, and health-illness variables. The average amount of exercise per week should be assessed, in addition to type of exercise being performed.

In the current study, both baseline hopelessness and depression symptoms were found to be significant predictors of decreased physical functioning at three months. It is recognized that decreased physical functioning may also be predictive of increased hopelessness and depression symptoms. Future research examining the modeling of the pathways among hopelessness symptoms, depression symptoms, and physical functioning would help to discern these potential reciprocal relationships and better define how hopelessness symptoms, depression symptoms, and physical functioning may potentially respond to therapeutic intervention.

Finally, it is unknown how hopelessness symptoms may affect other post-MI outcomes. Symptoms of hopelessness have been associated with increased risk of fatal and nonfatal CHD and MI (Anda et al., 1993; Barefoot et al., 2000; Everson et al., 1996). How hopelessness may affect morbidity and mortality after a MI event is unknown and requires further investigation. The current study identified increased hopelessness symptoms as predictive of decreased hospital-based exercise participation. How hopelessness symptoms might affect adherence to other lifestyle recommendations is unknown. Research is needed to evaluate the effect of hopelessness symptoms on adherence to a heart-healthy diet, weight reduction, smoking cessation, and compliance with prescribed medications. Because increased hopelessness symptoms were also found predictive of increased depression symptoms and decreased physical functioning, it would also be of interest to examine the effect of increased hopelessness symptoms on post-MI patients' quality of life.

Additional Implications for Nursing Research

Conceptualization of hopelessness. The discipline of nursing has recognized hopelessness as an important concept for a number of years. However, conceptual definitions of hopelessness differ in the nursing literature and differ from definitions found in the psychology literature. A common conceptual model of hopelessness in physical illness is needed. This model should include the antecedents, attributes, and consequences of hopelessness specific to physical illness, the differentiation of state and trait hopelessness, and how physical illness may impact both state and trait hopelessness. It is imperative that the model include both the distinction of hopelessness and depression symptoms, as well as the relationship between the two concepts. Testing of the

conceptual model would be essential to either validate or support refinements to NANDA's (1996) conceptualization of hopelessness.

Measurement of hopelessness. Research to evaluate existing hopelessness tools for their use in physical illness is needed. In particular, it must be determined if the dimensions/factors found in the widely used Beck Hopelessness Scale® (i.e. cognitive expectations, affective, and motivational dimensions) (Beck et al., 1974) are applicable to physically ill patients. Hopelessness at times may be a justifiable response to a negative event out of a person's control; however, hopelessness has potential to affect the quality of a patient's recovery and restoration of optimal health. Research related to the presence, severity, and consequences of hopelessness symptoms in specific illness populations is paramount in that it is not known if hopelessness presents itself similarly among various illnesses and it is unknown how hopelessness may affect a variety of health outcomes. It will also be essential to evaluate the optimal points in time for measuring hopelessness in physical illness as it is currently unknown at what point in time hopelessness symptoms develop and at what time point interventions would be most effective in preventing, diminishing or relieving hopelessness.

Biopsychosocial relationship between hopelessness and coronary heart disease. The biopsychosocial relationship between hopelessness and CHD outcomes is currently not understood. However, hopelessness may be similar to depression in its pathogenesis of CHD and related outcomes. Research is needed to evaluate possible biomarkers for hopelessness symptoms, including cholesterol levels, inflammatory risk markers, glucocorticoids, and serotonin levels, all of which potentially have vasoconstrictive or atherogenesis properties.

Intervention research. As described earlier, nursing research is needed to further describe the frequency and severity of hopelessness symptoms post-MI, the relationship between hopelessness and depression symptoms, predictors of hopelessness symptoms, and consequences of hopelessness symptoms. Ultimately, this research may lead to the design of effective nursing interventions that prevent, decrease, or resolve hopelessness symptoms after a MI. Intervention research may include patient education and counseling strategies by the staff nurse or cardiac rehabilitation nurse during the patient's hospitalization for an acute MI. Other interventions to be researched may include outpatient teaching, counseling, or coaching by a staff nurse, cardiac rehabilitation nurse, nurse case manager, or advanced practice nurse via telephone calls, telemonitoring, home visits, or office visits. Research related to cognitive therapy interventions for patients with confirmed hopelessness symptoms post-MI by trained nurses would be of interest.

Implications for Nursing Practice.

In addition to consequences for research, this study has essential implications for nursing practice. Health care providers face a number of challenges in caring for post-MI patients, including the need to educate, motivate, and counsel patients during treatment and recovery. These challenges may be compounded when a patient is hopeless and/or depressed. Previous research over the past two decades has demonstrated that depressed CHD patients are less adherent to medical advice, are at greater risk of quitting cardiac rehabilitation (Blumenthal et al., 1982; Ziegelstein et al., 2000), have decreased physical functioning (Blumenthal et al., 1997), and decreased aerobic capacity (Glazer et al., 2002) as compared to non-depressed CHD patients. Although no previous research was found examining the effect of hopelessness on health outcomes after a MI, hopeless

individuals have negative and helplessness expectancies about the future and thus may be unable to identify a purpose in adhering to a treatment regime and lifestyle changes if they do not believe it will make a difference in their health outcomes. The results of this study will contribute to practitioners' understanding of hopelessness symptoms in the early MI recovery period, assisting them in the assessment and treatment of patients with hopelessness symptoms.

Frequency and severity of hopelessness symptoms. In this sample, hopelessness symptoms were frequent and moderate to severe in a portion of patients at both baseline and three months, and did not decrease significantly over the three month period. Practitioners must have an understanding of the symptoms of hopelessness (see Figure 1) in order to assess and diagnose its presence in post-MI patients. Additionally, health care providers must be able to assess the persistence of hopelessness symptoms in post-MI patients over time, recognizing that hopelessness may represent a state in which the patient is responding to the negative life event (i.e. MI) or may represent a chronic trait for given patients.

Effective nursing interventions for hopelessness symptoms in response to physical illness are unknown. The presence of trait hopelessness may be difficult to modify and would likely require long-term psychotherapy (Beck et al., 1990). However, state hopelessness is generally modifiable (Beck et al.). Abramson et al. (1989) recommend the use of situational cues, including education and counseling. Early research did show that depressed individuals treated with cognitive therapy had a more rapid reduction in hopelessness than individuals treated with antidepressant drugs (Rush et al., 1982). Cognitive therapy, designed to decrease negative views of one's self and future, could be

used by trained nurses. In addition, the use of positive psychology, learned optimism, and hope have been identified as effective interventions for hopelessness (Seligman, 2000). These strategies increase positive views of one's self and future.

Relationship between hopelessness and depression symptoms. This study found hopelessness symptoms to be moderately to strongly correlated with depression symptoms, yet distinct from depression in number of ways. Practitioners must be educated to assess the distinct symptoms of hopelessness and depression (see Figure 1), which can resemble each other in a number of ways. Uncertainty regarding the distinction between hopelessness and depression may be reduced if the practitioner assesses hopelessness as a future-oriented concept that is focused on expectations about the future, while assessing depression as a condition that often occurs in response to a past event.

As illustrated in Figure 1, practitioners must also be educated that hopelessness symptoms can potentially lead to symptoms of depression (Alloy et al., 1999; Joiner et al., 2001; Johnson et al., 2001). In addition, hopelessness, beginning as a precursor, can continue in conjunction with depression in some patients (Joiner, et al.). A portion of subjects in this study were found to have symptoms of both hopelessness and depression. Assessment and interventions must include the possibility of the presence of both hopelessness and depression symptoms in some post-MI patients.

Predictors of hopelessness symptoms. In the current study, a non-married status was a predictor of hopelessness symptoms at three months post-MI. Practitioners should recognize that non-married post-MI patients may be at increased risk for hopelessness symptoms in the early recovery period. Particular attention should be placed on the

assessment of hopelessness symptoms in non-married individuals with appropriate interventions as needed.

Hopelessness as a predictor of exercise participation and physical functioning.

Practitioners working with post-MI patients must have an understanding of the effect that hopelessness symptoms can have on post-MI outcomes. The current study identified increased hopelessness symptoms as predictive of not starting hospital-based cardiac rehabilitation exercise and of quitting a hospital-based exercise program early. It is essential that practitioners identify post-MI patients with increased hopelessness symptoms so that additional emphasis can be placed on encouraging hopeless individuals to start a hospital-based cardiac rehabilitation exercise program. Additionally, health care providers must recognize the importance of encouraging patients with increased hopelessness symptoms to continue the hospital-based program until it is completed. The current study also suggests that post-MI patients with increased hopelessness symptoms may be less likely to either hear or receive a physician recommendation for home-based exercise. A formal physician's order is not required for home-based exercise; however, encouragement from the physician and other health care providers may be especially needed for post-MI patients who are hopeless.

Health care providers must also have an understanding that increased hopelessness symptoms are predictive of decreased physical functioning in post-MI patients. Practitioners must identify those post-MI patients with hopelessness symptoms so that emphasis can be placed on encouraging these patients in their activities of daily living and exercise. Additional follow-up may be needed with these patients after their discharge home, including visits from a home health nurse or physical therapist.

Conclusion

This descriptive study is an important early step in the research of hopelessness symptoms after an acute MI. A large sample size and the longitudinal analysis of both hopelessness and depression symptoms in this post-MI sample contributed to the strengths of the study findings. Similar to previous research in the cardiovascular literature, depression symptoms in the current study were initially prevalent and severe but significantly decreased in the first few months after a MI. Hopelessness symptoms were also prevalent and severe in this study at the outset, but surprisingly did not decrease in the three-month recovery period. Although hopelessness and depression symptoms were fairly strongly correlated in this study, a number of distinctions between the two variables were evident, including frequency and severity over time, antecedents, and effects on cardiac rehabilitation exercise participation.

Novel findings from the current study will help to increase the practitioner's knowledge of the frequency, severity, and persistence of hopelessness symptoms post-MI, including those post-MI patients at risk for hopelessness symptoms. This study will also assist the practitioner in differentiating symptoms of hopelessness from depression. Study findings support the need for practitioners to assess for hopelessness symptoms in post-MI patients, to encourage those with symptoms of hopelessness in performing their activities of daily living to their full potential, and to encourage participation in a cardiac rehabilitation exercise program. Further research is needed to assist in the identification of additional subgroups at risk for hopelessness symptoms, to further distinguish the relationship between hopelessness and depression symptoms, and to identify the effects of hopelessness on additional post-MI outcomes. Future research could ultimately lead to

nursing interventions focused on the prevention and treatment of hopelessness symptoms and the prevention of adverse outcomes.

APPENDICES

Antecedent Patient Factors

Baseline Self-Report Telephone Tool

1. Are you of Hispanic or Latino origin? ____
 - (1) Yes
 - (2) No
 - (3) Missing
 - (4) Don't know
 - (5) Refused

2. What is your race? ____
 - (1) White
 - (2) Black/African American
 - (3) American Indian or Alaska Native
 - (4) Native Hawaiian or other Pacific Islander
 - (5) Asian
 - (6) Other _____
 - (7) Missing
 - (8) Don't know
 - (9) Refused

3. What is your marital status? ____
 - (1) Married
 - (2) Separated
 - (3) Divorced
 - (4) Widowed
 - (5) Never been married
 - (6) Missing
 - (7) Don't know
 - (8) Refused

4. Is there someone who helps you with care after being in the hospital? ____
 - (1) Yes
 - (2) No
 - (3) Missing
 - (4) Don't know
 - (5) Refused

5. Have you personally ever been diagnosed or treated for depression? ____
 - (1) Yes
 - (2) No
 - (3) Missing
 - (4) Don't know
 - (5) Refused

6. Prior to this hospitalization, have you ever been diagnosed or treated for a heart attack? _____

- (1) Yes
- (2) No
- (3) Missing
- (4) Don't know
- (5) Refused

Antecedent Patient Factors

Chart Abstraction Form

1. Control or experimental group assignment
2. Date of birth: __/__/__
3. Sex: Male (1) / Female (2) ____
4. Ejection fraction percentage via cardiac catheterization or echocardiogram: ____

Five-item Cognitive Expectations Factor of the Beck Hopelessness Scale® (BHS®)

(Sample Items)

1. (Item #4)
I can't visualize my future.
(1) True
(2) False
(7) Don't know
(9) Refused
2. (Item #7)
My future is dismal.
(1) True
(2) False
(7) Don't know
(9) Refused
3. (Item #8)
I have good luck and positive things happen to me.
(1) True
(2) False
(7) Don't know
(9) Refused
4. (Item #14)
Things don't go my way.
(1) True
(2) False
(7) Don't know
(9) Refused
5. (Item #18)
The future is unclear.
(1) True
(2) False
(7) Don't know
(9) Refused

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Center for Epidemiologic Studies- Depression Scale

For each statement, tell me which best describes how often you felt or behaved this way within the past week.

WITHIN THE PAST WEEK	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or moderate amount of time (3-4 days)	Most or all of the time (5-7 days)	Missing/ Don't know/ Refused
	0	1	2	3	9
1. I was bothered by things that usually don't bother me.					
2. I did not feel like eating; my appetite was poor.					
3. I felt that I could not shake off the blues even with help from my family or friends.					
4. I felt that I was just as good as other people.					
5. I had trouble keeping my mind on what I was doing.					
6. I felt depressed.					

7. I felt that everything I did was an effort.					
8. I felt hopeful about the future.					
9. I thought my life had been a failure.					
10. I felt fearful.					
11. My sleep was restless.					
12. I was happy.					
13. It seemed that I talked less than usual.					
14. I felt lonely.					
15. People were unfriendly.					
16. I enjoyed life.					
17. I had crying spells.					
18. I felt sad.					
19. I felt that people disliked me.					
20. I could not get "going".					

Cardiac Rehabilitation Exercise Participation Tool

1. Did your physician recommend a hospital or clinic-based cardiac rehab exercise program for you?
 - (1) Yes
 - (2) No (go to Q8)
 - (9) Missing/don't know/refused
2. On a scale of 1 to 5, with 1 being mild and 5 being strong, how would you rate the physician's recommendation for the exercise program?
 - (1) 1 (Mild)
 - (2) 2
 - (3) 3
 - (4) 4
 - (5) 5 (Strong)
 - (9) Missing/don't know/refused
3. Did you begin participation in the exercise program?
 - (1) No
 - (2) Yes (go to Q 5)
 - (9) Missing/don't know/refused
4. What were the reasons you did not begin the exercise program?(circle all that apply)
 - (1) Lack of energy
 - (2) Lack of motivation
 - (3) Financial cost or lack of insurance
 - (4) Distance to cardiac rehabilitation site
 - (5) Transportation problems
 - (6) Heart condition prevented participation
 - (7) Other health condition prevented participation
 - (8) Physician did not encourage
 - (9) No cardiac rehabilitation program was available outside of the home
 - (10) Cardiac rehabilitation program offered at an inconvenient time
 - (11) Conflicts with work or other activities
 - (12) Other (specify): _____
 - (99) Missing/don't know/refused
5. Are you still participating in the exercise program?
 - (1) Yes: Still attending the program at this time (go to Q 7)
 - (2) No: Completed the program
 - (3) No: Quit before the program was completed
 - (9) Missing/don't know/refused

6. What were the reasons you did not complete the exercise program? (circle all that apply)

- (1) Lack of energy
- (2) Lack of motivation
- (3) Financial cost or lack of insurance
- (4) Distance to cardiac rehabilitation site
- (5) Transportation problems
- (6) Heart condition prevented participation
- (7) Other health condition prevented participation
- (8) Physician did not encourage
- (9) No cardiac rehabilitation program was available outside of the home
- (10) Cardiac rehabilitation program offered at an inconvenient time
- (11) Conflicts with work or other activities
- (12) Other (specify): _____
- (99) Missing/don't know/refused

7. On an average, how many days a week have you participated in the exercise program?

- (1) One day
- (2) Two days
- (3) Three days
- (4) Four days
- (5) Five days
- (6) Six days
- (7) Seven days
- (9) Missing/don't know/refused

8. Did your physician recommend any other type of exercise program, such as walking or biking at home?

- (1) No (go to Q 10)
- (2) Yes
- (9) Missing/don't know/refused

9. On a scale of 1 to 5, with 1 being mild and 5 being strong, how would you rate the recommendation of the exercise program?

- (1) 1 (Mild)
- (2) 2
- (3) 3
- (4) 4
- (5) 5 (Strong)
- (9) Missing/don't know/refused

10. Did you begin participation in the exercise program?
- (1) No
 - (2) Yes (Go to Q 12)
 - (9) Missing/don't know/refused
11. What were the reasons you did not begin the exercise program? (circle all that apply)
- (1) Lack of energy
 - (2) Lack of motivation
 - (3) Financial cost or lack of insurance
 - (4) Distance to cardiac rehabilitation site
 - (5) Transportation problems
 - (6) Heart condition prevented participation
 - (7) Other health condition prevented participation
 - (8) Physician did not encourage
 - (9) No cardiac rehabilitation program was available outside of the home
 - (10) Cardiac rehabilitation program offered at an inconvenient time
 - (11) Conflicts with work or other activities
 - (12) Other (specify): _____
 - (99) Missing/don't know/refused
12. On an average, how many days a week have you participated in the exercise program?
- (1) One day
 - (2) Two days
 - (3) Three days
 - (4) Four days
 - (5) Five days
 - (6) Six days
 - (7) Seven days
 - (9) Missing/don't know/refused

Activity Status Index

These questions are about any physical limitations that you might have. For each question, please rate whether, in the previous month, you could do one or more of the activities. Some questions mention more than one activity. Answer according to the one activity you could do best. Please choose the one answer that best describes you. If you have never done an activity or don't usually do it, answer "I don't do this for other reasons."

IN THE PREVIOUS MONTH COULD YOU...	No, I can't do this 1	Yes, but with some difficulty 2	Yes, with no difficulty 3	Don't do this for other reasons 4	Missing/ Don't know/ Refused 9
1. ...take care of yourself, that is eating, dressing, bathing or using the toilet?					
2. ...walk indoors, such as around your house?					
3. ...walk a block or two on level ground?					
4. ...climb a flight of stairs or walk up a hill?					
5. ...run a short distance?					
6. ...do light work around the house like dusting or washing dishes?					
7. ...do moderate work around the house like vacuuming, sweeping floors, or carrying in groceries?					
8. ...do heavy work around the house like scrubbing floors, or lifting or moving heavy furniture?					

9. ...do yardwork like raking leaves, weeding or pushing a power mower?					
10. ...have sexual relations?					
11. participate in moderate recreational activities like golf, bowling, dancing, doubles tennis, or throwing a baseball or football?					
12. ...participate in strenuous sports like swimming, singles tennis, football, basketball or skiing?					

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