

LEARNED HELPLESSNESS AND DEPRESSIVE SYMPTOMS IN PATIENTS  
FOLLOWING ACUTE MYOCARDIAL INFARCTION

By

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This endeavor would not have been possible without the dedication of my support staff:

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## CHAPTER I

### INTRODUCTION

Acute myocardial infarction (AMI) is associated with physical and psychosocial stressors that have the potential for negatively affecting health outcomes and disease progression. These physical and psychosocial stressors are often associated with a perceived loss of situational predictability, accountability, and controllability. With the continued perception that an individual's responses and outcomes are independent of personal actions, the individual fails to initiate possible interventions and a number of negative health outcomes are at risk for developing, such as increased re-hospitalizations, poor regimen adherence (due to behavioral disengagement), increased cardiac mortality, and depressive symptoms. Of these negative outcomes, depressive symptoms are a clinically important, modifiable risk factor for negative health outcomes across clinical populations affected by both acute and chronic medical illnesses. For example, Bush (2005) and Strik (2001) reported the incidence of depressive symptoms to be four times greater in individuals who have experienced an AMI compared to the general population, with nearly one-third of patients experiencing major psychological depression after an AMI.

Moser and Dracup (1995) reported as many as 40% of individuals experience long-term difficulties in psychosocial adaptation independent of their physical status following AMI. Such difficulties have the ability to interfere with an individual's return to work, leisure activities, and sexual activities. Additionally, these individuals can experience social

isolation, have low adherence to health maintenance regimens, and have unrealistic health perceptions (Dracup, 2003).

Perceptions or beliefs that an individual has the ability to directly influence his or her outcomes have been shown to mitigate the development of psychological distress. These subjective perceptions and beliefs of influence could, in fact, be more robust predictors of situational outcomes than objective factors. The fundamental process of psychosocial adjustment after an AMI includes the attempt to regain a sense of personal control. Controllability and predictability of situational stressors have been shown to improve psychosocial adjustment and, therefore, diminish the incidence of situational helplessness (Agarwal, Dalal, Agarwal, & Agarwal, 1995; Moser & Dracup, 1995; Nicassio, Wallston, Callahan, Herbert, & Pincus, 1985). Without a perceived ability to influence outcomes of a stressful situation, an individual is at high risk for developing negative human responses. Thus, situational helplessness is one human response to the perceived inability to influence outcomes of a situation and a factor contributing to the development of psychological distress in individuals following AMI (Milberg, Strang, & Jakobsson, 2004; Moser, 1995).

A number of psychosocial factors are known to have an impact on the incidence and severity of depressive symptoms across clinical populations. These factors include social support, self-efficacy, helplessness, socioeconomic status, and life events causing feelings of loss/bereavement and psychological disability (e.g., fear and anxiety) (Areán & Reynolds, 2005). A review of the existing empirical and theoretical literature supports that helplessness is associated with depressive symptoms in patients with medical conditions such as chronic pain (Burns, Kubilus, Bruehl, Harden, & Lofland, 2003), epilepsy (Endermann, 1997), and rheumatoid arthritis (Nicassio, Wallston, Callahan, Herbert, & Pincus, 1985), and in patients

with nonspecific disorders requiring both inpatient and outpatient services (Raps, 1982).

Despite these known associations, little is known about the nature of the relationship between helplessness and depressive symptoms in individuals who have experienced AMI.

An individual's perception of the controllability and predictability of his or her environment is a cornerstone of psychological outcomes (Seligman, 1975). When faced with an impaired ability to influence a change in personal surroundings, an individual's ability to predict, account for, and control a given situation is impacted. With the continued perception that outcomes are independent of personal actions, the individual fails to initiate possible interventions to manipulate the circumstance at hand, and situational helplessness is at a greater risk for developing. Thus, it is theorized that the occurrence of situational helplessness can precede increased incidence of depressive symptoms. As depressive symptoms become more significant (i.e., more intrusive into daily life), an individual's recovery from an acute illness is negatively impacted (Frasure-Smith, 1993).

#### Stressors in Individuals Following AMI

Multiple factors influence the recovery trajectory in individuals following AMI, such as knowledge of the recovery process, understanding of cardiac pathophysiology, and severity of the AMI (Wiles, 1998). After hospital discharge, the optimum recovery course would include the individual returning to levels of physical, sexual, and emotional activity comparable to pre-illness levels and an effective re-integration into society (Milberg, 2004; Moser, 1995). This is not always the case, however, since many individuals are often affected by varying levels of physical dysfunction and psychological distress associated with their heart disease.

Physical Dysfunction. AMI is the rapid development of myocardial necrosis caused by an acute reduction of blood supply to a portion of the myocardium. A complex cascade of events involving macro-circulatory and micro-circulatory changes, electrical and mechanical dysfunction, and neurohormonal alterations creates a critical imbalance between the oxygen supply and demand of myocardial cells (Fenton, 2006). The intended goal of physiologic-based interventions is to re-establish the relationship between myocardial perfusion/oxygen-nutrient supply and myocardial oxygen-nutrient demand to minimize cell necrosis. If the oxygen-nutrient supply is unable to meet the demand, long-term or permanent physical dysfunction of the myocardium can develop. The ensuing physical signs and symptoms may include activity intolerance, dysrhythmias, recurrent chest pain, respiratory complications, heart failure, cardiogenic shock, and renal failure (Guyton, 2000; Massie, 2004; Pepine, 1989; Sheps, 1987; Watnick & Morrison, 2004). Treatment pathways designed to optimize AMI recovery are highly regulated and aim to minimize myocardial damage. Such pathways include pharmacologic management, various reperfusion therapies (e.g., percutaneous revascularization, thrombolytic therapy, surgical revascularization), and exercise regimens.

Physical dysfunction resulting from AMI can have short-term and long-term consequences. Immediately following, and within the first year of the AMI, an individual may experience activity intolerance, dysrhythmias, recurrent chest pains, respiratory complications, acute heart failure, acute renal failure, and cardiogenic shock (Guyton, 2000; Massie, 2004; Pepine, 1989; Sheps, 1987). Beyond the short-term effects of AMI, long-term physical outcomes may include congestive heart failure, physical disability, chronic renal insufficiency/failure, or sudden death (Massie, 2004; Sheps, 1987; Watnick & Morrison, 2004).

Individuals frequently rely on trained medical professionals following an AMI for assistance in management of both short-term and long-term outcomes. A sense of dependence on medical staff contributes to a perception of frustration and uncontrollability of the recovery process, in addition to the unpredictability of recognizing another AMI if it were to occur (Johansson, Dahlberg, & Ekebergh, 2003). Thus, these perceptions may facilitate the development of a situational helplessness.

Psychological Distress. In addition to the physical dysfunction described above, results from earlier studies indicate that individuals who have an AMI may experience negative psychological states, such as depression. In fact, the incidence of clinically significant depression in patients with AMI is reported to range from 15- 65% (Billings, Kearns, & Levene, 1981; Fielding, 1991; Frasure-Smith, Lesperance, & Talajic, 1993; Ladwig, Röhl, Breithardt, Budde, & Borggrefe, 1994; Moser & Dracup, 1995; Sirois & Burg, 2003; von Känel & Begré, 2006). In the general population, approximately 10% of individuals experience depressive symptoms. Approximately 15-30% of individuals who experience depressive symptoms eventually develop a major depressive disorder (Bush, 2005; Strik, 2001). These negative psychological states can have systemic effects on an individual recovering from an AMI, such as a diminished interest in pleasure, weight alterations, sleep pattern disturbances, fatigue, and a delay in returning to pre-AMI activity levels. Further, the presence of depressive symptoms is associated with a two-fold increase in cardiac morbidity (e.g., re-hospitalization rates) and mortality (Bush, 2005; Lane, 2001; Mendes de Leon, 2006). In contrast, non-depressed individuals who have experienced an AMI demonstrate improved outcomes, such as less helplessness, anger, and anxiety, and

lower incidence of post-AMI mortality (Agewall, 2004; Dempster, 2000; Hillers, 1994; Norekvål, 2007; Oldridge, 1991; Parker, 1997; White, 2007; Wiklund, 1989).

### Psychosocial Factors Known to Affect Stress-Related Outcomes

Traditional cardiovascular risk factors, such as smoking, hypertension, elevated blood lipids, and diabetes are identified in the literature as modifiable risk factors associated with AMI (AHA, 2001). A growing body of evidence indicates that psychosocial factors also have a key role in the recovery of individuals who have experienced a change in their baseline health status. These factors include negative human emotions (e.g., depressive symptoms and anxiety), helplessness, self-efficacy, psychosocial stress (e.g., occupational and acute life stress), and social factors (e.g., social support and social conflict) (Everson-Rose & Lewis, 2005).

### Perceived Social Support

Social support refers to an individual's self-perception of his or her degree and quality of intimate social ties, such as marital status, cohabitation, availability and size of social network, frequency of social activities, and group membership (Burg et al., 2005). As such, social support captures the qualitative aspects of such social interactions identifying individual's interactions, interpersonal relationships, and the extent of extracurricular activities. Increased perceived social support has been found to predict survival and has been linked with mortality in patients after AMI. Low perceived social support also has been found to correlate with worsened medical outcomes (e.g., increased mortality, prolonged hospitalization, re-hospitalization) independent of medical co-morbidities (Burg, 2005).



### Perceived Self-Efficacy

Self-efficacy is a psychological characteristic that is associated with both physiologic outcomes and health-related behavior (Bandura, 1991). Perceived self-efficacy represents an individual's perception of how capable he or she is of performing a specific activity or task, predicts whether a specific activity will be attempted, and determines how long the individual will persevere in the face of significant challenges (Coyne & Smith, 1994; Gardner, McConnell, Klinger, Herman, Hauck, & Lauback, 2003). Perceived self-efficacy also relates to an individual's process of deciding what response he or she will take, how much effort will be put forth, and how much stress will be experienced (Bandura, O'Leary, Taylor, Gauthier, & Gossard, 1987). An individual's level of self-efficacy predicts whether a specific activity will be attempted. In post-AMI subjects, higher levels of self-efficacy reliably predicted more adherence to exercise regimens, dietary recommendations, and functional capacity during cardiac rehabilitation (Gardner, 2003). According to Waltz and Bandura (1988), feelings of decreased self-efficacy lead to an erosion of positive attitudes and an increase in the occurrence of depressive disorders.

### Perceived Helplessness

Perceived helplessness (a form of situational helplessness) is a potential human response to a variety of psychological, physiological, and sociological experiences resulting from the perceived inability to influence the outcomes of events felt to be significant to an individual (Collins, 1967; Seligman, 1975). It is through this response-outcome independence that an individual experiences perceptions of unpredictability, uncontrollability, and frustration. When an individual believes he or she is unable to predict or control surrounding events or outcomes, he or she develops frustration within the

situation, and a situational helplessness is at risk for developing. In the face of negative human emotions, patient outcomes are at greater risk of being negatively impacted. Likewise, if patients are not prepared with adequate tools and resources to effectively reintegrate into society, they are at risk for perceiving themselves as being helpless and, therefore, make no attempt to manipulate previous activities that may have contributed to AMI. Overall, outcomes of individuals who have experienced an AMI have a reciprocal relationship with the perception of helplessness as a result of both physiologic distress and psychological distress.

### Significance

The effects of psychosocial factors (including depressive symptoms) following an AMI extend beyond the time period of the acute coronary event. Negative effects may be experienced across multiple aspects of individuals' lives. These effects, however, impact more than the individual. The impact of psychosocial factors on individuals who have experienced AMI also encompasses effects on society, healthcare, and nursing.

Significance to Society. As stated by the American Heart Association (AHA) (2006), every 26 seconds an American experiences an AMI, with one death occurring every 60 seconds. In 2003, an estimated 700,000 Americans had their first AMI. Tennessee ranked the third highest in death rate from AMI of all 50 states, Washington D.C., and Puerto Rico. The average age for a first-time AMI is 65.8 years of age for men and 70.4 years of age for women. Of these, an estimated 175,000 Americans will have a silent, first-time AMI each year.

In 2005, the total number of deaths in the United States related to heart disease was approximately 652,000, a 2.1% increase from 2004 data (Kung, 2008). This made heart

disease the number one cause of death, followed by malignant neoplasms, cerebrovascular disease, chronic lower airway diseases, and accidental death. Compared to epidemiologic data from 2003, in 2006 an estimated 770,000 Americans experienced their first AMI with the average age for a first-time AMI of 64.5 years for men and 70.4 years for women (AHA, 2008). These data not only show an increase in the number of AMIs, but also a possible trend towards the occurrence of AMI at a younger age.

With the number of individuals experiencing AMI increasing each year, the possible impact on society is vast. Not only is this event life threatening, but also the potential psychological factors pose a threat to both access to healthcare and healthcare utilization by the individual. These factors, in turn, may complicate an individual's recovery and thus their re-integration into society.

Significance to Healthcare. Changes in the healthcare system to refocus on public health and the growing impact of altered demographics on national health status prompted the United States Department of Health and Human Services (USDHHS) to publish "*Healthy People 2010*." The purpose of this document was to reflect on the scientific advances that have taken place over the past 20 years and to present a comprehensive nationwide health promotion and disease prevention agenda. One of the two goals of USDHHS and *Healthy People 2010* is to "increase quality and years of healthy life" (p. 2).

Life expectancy has increased from 72.5 years for men and 78.9 years for women in 1995 to 75.2 years for men and 80.4 years for women in 2005 (Kung, 2008; USDHHS, 2000). The goal of *Healthy People 2010* is to have life expectancy of 79.7 years for men and 84.3 years for women by the year 2050. This would be achieved by helping individuals gain

the knowledge, motivation, and opportunities they need to make educated decisions about their health (USDHHS, 2000).

Considering the data presented in the section above indicating a trend toward AMI at younger ages and yet an increasing life expectancy, an individual is likely to live longer with a medical diagnosis associated with physical dysfunction and psychological factors. Tables 1 and 2 summarize data from the AHA for the prevalence of individuals in whom coronary heart disease has been diagnosed based on gender, ethnicity, and age in 2004.

Table 1. Prevalence of Coronary Heart Disease in 2004

	Males	Females	Total
White	9.6%	6.0%	15.6%
Black	7.1%	7.8%	14.9%
Hispanic	5.6%	15.3%	20.3%
Asian/Pacific Islander	-----	-----	84.1K*
American Indian/ Alaskan Natives	7.6%	4.9%	12.5%
Total prevalence	5.0 million	3.0 million	8.0 million

\*statistics per 100K

(AHA, 2008)

Table 2. Annual Number of New AMI in 2004

	Non-black 65-74 years	Non-black 75-84 years	Black 65-74 years	Black 75-84 years
Men	31.4	41.7	28.7	40.9
Women	15.1	23.9	17.8	27.5

\*statistics per 1,000

(AHA, 2008)

The effects of psychosocial factors following an AMI may have a direct impact on healthcare utilization and the cost of healthcare. The average cost for treatment and recovery

of an AMI is estimated at \$75,000 (AHA, 2006). Individuals experiencing depressive symptoms may require health services (e.g. psychotherapy) not typically provided to individuals who experience an AMI. These additional medical services may increase the total cost of treatment close to \$100,000 (Cho, Ketefian, Barkauskas, & Smith, 2003). Levine et al. (1996) demonstrated that an increase in psychological distress has been shown to increase in-hospital lengths of stay in addition to out of hospital resources. On average, a 2.3-day increase in the length of stay adds approximately \$4,500 to the total cost of the hospitalization. This type of financial obligation will place a strain on the budget of most American families.

For an individual with a diagnosis of AMI, secondary prevention within itself has the potential to promote psychosocial distress. The additional financial strain and obligation associated with lifestyle modifications can present a patient with feelings of not having a choice; therefore, placing him or her into a stressful situation perceived as uncontrollable (Daly et al., 2000; Johansson, Dahlberg, & Ekebergh, 2003). Clinicians prescribe a special diet and a regular exercise routine as part of the therapeutic regimen for patients with an AMI. Frequently, this requires individuals to purchase higher quality and more expensive food products than they previously have. Additional time is needed for the preparation of these meals. Thirty to 60 minutes of vigorous activity, three times a week, is recommended for cardiovascular health (AHA, 2001). The daily schedules of many working patients who are recovering from AMI are already occupied by work and family demands. These individuals are expected to make a dedication to their health, which requires a time sacrifice from another aspect of their life. These added demands on patients with an AMI contribute to the development of helplessness.

Significance to Nursing. The discipline, science, and practice of nursing is appropriate for studying environmental and situational factors that have the potential to minimize psychological distress in acute and chronic illness. Nursing, as defined by the American Nurses Association (ANA) (2000), is “the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of human responses, and advocacy in the care of individuals, families, communities, and populations” (p. 6). The ANA also includes six essential features of nursing. Five of these features are relevant to the relationship between helplessness and depressive symptoms:

- Provision of a caring relationship that facilitates health and healing.
- Attention to the range of human experiences and responses to health and illness within the physical and social environment.
- Integration of objective data with knowledge gained from an appreciation of the patient or group’s subjective experiences.
- Application of scientific knowledge gained from an appreciation of the patient or group’s subjective experiences.
- Advancement of professional nursing knowledge through scholarly inquiry. (p.5)

In remaining consistent with these statements, the healthcare team must focus on holistic care so that the protection and optimization of health can be promoted through illness prevention, treatment, and patient advocacy.

The relationship between helplessness and depressive symptoms in individuals who have experienced AMI is relevant to the discipline of nursing through a nurse’s ability to optimize health. The effectiveness of nursing interventions in modifying negative reactions

to situational stressors has been well documented in the literature. These interventions are more effective when the nurse individualizes a plan of care based on the individual's human experiences, relationships, environmental interactions, and human responses to previous situations that may be viewed as comparable. Nurses may be the first to recognize symptoms of psychosocial distress, and, therefore, could mitigate its progression and the ensuing psychological distress.

### Purpose

The purpose of this dissertation research study is to investigate the associations among helplessness, depressive symptoms, and targeted demographic, clinical, and psychosocial factors in individuals who have experienced an AMI. The research questions that will guide this study are:

- What is the relationship between helplessness and depressive symptoms in patients who have experienced AMI?
- What are the effects of demographic, clinical, and psychosocial factors on the relationship between helplessness and depressive symptoms?

### Summary

An individual's perceived loss of predictability, accountability, and controllability following an AMI is associated with health-related outcomes, including psychological distress. Although potentially modified by psychosocial factors such as social support and self-efficacy, psychological distress often leads to the development of depressive symptoms in individuals who have experienced an AMI. Given the nature of the extant literature, it is hypothesized that helplessness also is related to depressive symptoms in these individuals. Little is known, however, about the nature of this relationship. Mortality in individuals

following AMI is believed to be greatly impacted by the degree of psychological distress the individual experiences. The effect of psychological distress on health-related outcomes shows evidence of being significant to society, healthcare, and nursing. A better delineation of the relationship between helplessness and depressive symptoms following AMI could provide a better understanding to the incidence of psychological distress and the negative health-related outcomes associated with it.



## CHAPTER II

### REVIEW OF LITERATURE

The purpose of this chapter is to review the conceptual, theoretical, and research literature relevant to the study of helplessness in patients who have experienced AMIs. The literature review will then be used to explain the relationships between helplessness and depression. In addition, Learned Helplessness Theory, the theoretical framework used to guide the conceptualization of this dissertation research, will be explicated.

#### History of the Concept of Helplessness

In 1965, Seligman and colleagues used an animal model to study the relationship between fear and avoidance learning. Using the Pavlovian Theory of Classical Conditioning, Seligman attempted to condition dogs to learn fear through a tone stimulus preceding an electric shock. Seligman theorized that the dogs would perform some type of escape behavior as they learned the tone was associated with an unpleasant stimulus. The research team observed, however, that when dogs were restrained during the initial association activity, they learned trying to escape from the shock was futile. Once freed, the dogs made no attempt to escape the shock. Dogs who were unrestrained during the learning activity, however, readily learned to step over a small divide to escape the painful stimulus (Maier, Peterson, & Schwartz, 2000; Miller & Seligman, 1975).

Following his initial observations, Seligman used additional dog and rat models with other stimulus-response situations to validate his findings. These situations included dogs or rats being yoked together, independently placed in a Pavlovian hammock, and independently

placed in shuttle boxes. Seligman and Maier (1967) ultimately believed that the animals learned that shock termination was independent of any attempts on their part to respond to the shock. These findings helped develop the foundation for the *Learned Helplessness Hypothesis*.

Learned Helplessness. The *Learned Helplessness Hypothesis* states that learning interferes with the formation of associations between the escape response (i.e., moving to a safe zone) and shock termination. This learning then weakens the motivation to attempt to escape (Maier, Peterson, & Schwartz, 2000). For example, as an individual learns response-outcome independence, they ultimately conclude that there is no desired benefit to his or her actions. Therefore, in such situations, negative human response (e.g., low self-efficacy and psychological distress) are experienced and an individual's attempts at initiating escape behaviors diminish in frequency.

The study of learned helplessness bridged to human subjects from animal models through the sentinel work of Thornton and colleagues (1971). Their research involved introductory psychology students who were solicited and randomly divided into two groups and then blocked into four groups based on scores previously obtained from the Perceived Stress Index (PSI). Experimental conditions included: 1) no pretreatment; 2) connected to a stimulus producing apparatus and received escapable pretreatment associated with escapable testing; 3) inescapable pretreatment associated with inescapable testing; or 4) inescapable pretreatment with no further experimentation. Subjects were told that either they could terminate the shock with a series of buttons or the shock was inescapable and must be tolerated. The PSI was then re-administered before trial 1, after trial 15, and after trial 30. Following the pretreatment, subjects were brought to a test room and again connected to

shock electrodes with a button and light apparatus, but this time given no instructions other than shocks would be administered. Following the experiment, subjects were asked how they performed the task and if they did not respond, why not?

The results of this study indicated that individuals transferred their perceptions of helplessness learned during one situation to subsequent tasks, thus supporting how a situational helplessness could indeed transform into a habitual helplessness. The variability of shock intensity appeared to contribute to subject's ability to learn to avoid the stimuli. Groups receiving variable shock learned to avoid the stimulus during 82% of the trials, whereas fixed shock groups avoided only 49% of the shocks (Thornton, 1971). Subjects reported failure to attempt to escape shocks was related to the perception of having no control over the shocks. The interval between shocks was spent preparing for the next stimulus rather than trying to determine the method for avoiding them.

In 1975, Seligman and a colleague converted from the use of electrical stimuli on human subjects to the use of audible white noise to precipitate the perception of helplessness. A group of college students was divided and exposed to either an instrumental (e.g., requiring a button to be pressed four times) pretreatment method or a cognitive task (e.g., where subjects had to determine a pattern within symbols) pretreatment method that would terminate an audible tone. The subgroups then had to perform either the instrumental or cognitive task while being exposed to either a controllable or uncontrollable audible tone. Seligman found that the groups having uncontrollable tones showed impaired ability to perform the instrumental and cognitive tasks, while the groups receiving controllable tones readily performed the tasks presented to them (Hiroto & Seligman, 1975). These findings played a key role in demonstrating a learned helplessness phenomenon in humans that was

situational, as had been represented in dogs and rats, and further assisted in the development of the Learned Helplessness Theory (Abramson, Seligman, & Teasdale, 1978; Maier & Seligman, 1976).

Seligman built on previous work by extending his research to humans, and specifically to hospitalized patients (Raps, Peterson, Jonas, & Seligman, 1982). A combination of inpatient and outpatient participants with unspecified medical diagnoses were exposed to an audible tone that, unknown to the subjects, was either controllable by a specific action by them or was uncontrollable. The results of this study indicated that problem-solving deficits in the no-noise groups (indicative of helplessness) increased with length of hospital stay to eventually match the deficits produced by inescapable tones. Additionally, an increased number of hospitalizations made patients more susceptible to helplessness caused by inescapable tones not sufficient to cause helplessness in non-hospitalized subjects (Raps, Peterson, Jonas, & Seligman, 1982). These correlations support the association between repeat hospitalizations and increased length of stay with the emergence of learned helplessness. With repeated response-outcome independence, not only were subjects more prone to experience helplessness with what was felt to be insufficient levels of stimulation, but the subjects receiving no stimuli experienced a learned helplessness as a result of the specific situation of repeat hospitalization and increased length of stay. This phenomenon of subjects learning a response-outcome dissociation causing a decreased motivation to attempt further changes outlines the Learned Helplessness Theory.

### Learned Helplessness Theory

Maier and Seligman (1976) introduced the Learned Helplessness Theory following many years of animal and human experimentation. According to this theory, learned

helplessness occurs initially when an individual perceives a situation as an unfavorable stress or challenge. The individual therefore identifies potential actions to manipulate the situation to make it less challenging, less stressful, and/or more favorable. Following multiple failed attempts to influence the situation to an outcome desired by the individual, an expectation of response-outcome independence is learned. This response-outcome independence is a key assumption of the Learned Helplessness Theory. In individuals or animals that experience outcomes occurring independently of any self initiated action, an expectation is created that there will be no relationship between the individual's behavior and the outcome in the future (Alloy & Seligman, 1979). Frustration develops within the individual related to perceived uncontrollability and unpredictability of the experienced outcome. As a result, the individual learns there is independence between his or her response to a situation and the outcome that follows. This response-outcome independence reduces the individual's likelihood in future identical, or related, episodes of attempting to initiate a response; therefore, further learning of means to effect a change is impaired. It is within this setting of impaired learning and the perception of response-outcome independence that learned helplessness develops.

Key Assumptions. In the Learned Helplessness Theory, it is assumed that the motivation to initiate voluntary responses is produced by the expectation that responding produces relief (Maier & Seligman, 1976). In the absence of this motivation, the likelihood of voluntary responding will decrease. Second, it is assumed that learning an outcome is independent of a response makes it more difficult later to learn which responses produce what outcomes (Maier, & Seligman, 1976). Response-outcome independence is an active form of learning and can interfere with other forms of learning.

According to the Learned Helplessness Theory, an individual moves from situational perception to learning behaviors and outcomes are independent of one another as surrounding situations are unable to be influenced by personal actions. The expectation is that an outcome independent of response (1) reduces the motivation to control an outcome and (2) interferes with learning that respond to a situation will control the outcome. This response-outcome uncontrollability produces three effects: the motivation to respond is reduced, the cognitive ability to perceive success is undermined, and negative emotional responses develop (Maier & Seligman, 1976).

Motivational Effects on Helplessness. The motivation to influence any situation comes from the expectation that responding to a situation will change the expected outcome of the particular situation at hand. When an individual learns behaviors and outcomes are independent of one another, the expectation that change will occur diminishes. As a result, the motivation to voluntarily respond to a situation is likely to decrease (Seligman, 1975). Individuals have demonstrated a decrease in attempts to respond to a situation following repeated failures (Hiroto, 1975; Maier, 2000; Miller, 1975; Seligman, 1975; Thornton, 1971). This reduction in response initiation is due to a reduction in motivation. The loss of motivation to respond to later events also decreases (Maier & Seligman, 1976; Seligman, 1975). As demonstrated in a variety of research conditions (Maier, 2000; Miller, 1975; Seligman, 1975; Thornton, 1971), this undermining of motivation occurs following inescapable shock (e.g., following multiple failed attempts to escape an electric shock, the subject fails to attempt escape when the shock is administered). The weakening of response initiation by the subject is due to a loss in the incentive to initiate voluntary responses to an unfavorable situation.

Cognitive Effects on Helplessness. Short-term and long-term exposure to uncontrollable events also may have cognitive effects. As an individual experiences response-outcome independence, the individual actively learns that responses and outcomes are independent of each other (Seligman, 1975). A cognitive deficit (i.e., inability to understand an action will produce the desired outcome) is experienced that is not specific to the current situation, but rather may be applied to learning of prospective situations. Because of this cognitive deficit, individuals may develop an impairment in learning and recognizing when responses have succeeded in producing the desired outcome. Therefore, if the individual's action is successful in producing a desired outcome, they are typically unaware of this success. In future situations, whether related or unrelated, if the individual does choose to respond and a desired outcome is produced, the individual tends to remain unable to identify the presence of a desired response-outcome relationship and is unaware his or her action worked (Maier & Seligman, 1976).

As demonstrated in animal models (Maier, 2000; Miller, 1975; Seligman, 1975, 1967), previously restrained dogs had experienced cognitive deficits due to prior failed attempts to escape electric shocks. When the animals were unrestrained and able to escape, they did not do so as they learned escape was not possible. Even when the animals were encouraged to a safe, shock free location, they had delayed cognitive deficits and understanding that the action produced a desired outcome. Human studies using electric shock (Thornton, 1971) as well as audible tone (Hiroto, 1974, 1975; Miller 1975; Raps, 1982) have resulted in identical findings. When exposed to an undesired stimulus, subjects often reported failure to attempt to escape the stimulus was related to the perception of having no control over it. When associated with shocks, the interval between the stimuli was

spent preparing for the next impulse rather than trying to determine the method for avoiding them (Thornton, 1971). Additionally, human subjects transferred the perceptions of helplessness from one situation to a second task showing a habitual pattern to what originally appeared to be a situational helplessness (Thornton, 1971). This cognitive inability to perceive success and the existence of a negative cognitive set produced by independence between responding and outcomes outlines an important issue in cognitive effects of Learned Helplessness Theory (Maier & Seligman, 1976; Seligman, 1975).

Emotional Effects on Helplessness. As an individual experiences a situation he or she is unable to change or control, a heightened state of negative emotions is experienced. Negative emotions (e.g., depressive symptoms and anxiety) are characterized by fear, frustration, or a number of other psychological states (Seligman, 1975). This state of negative emotionality persists until either the response-outcome dissociation resolves and the subject returns back to a state of being able to control his or her surroundings, or the individual learns of the response-outcome independence and the emotional state gives way to depressive symptoms (Seligman, 1975). As seen in earlier animal and human studies (Hiroto, 1975; Maier, 2000; Miller, 1975; Seligman, 1975; Thornton, 1971), as subjects were exposed to such uncontrollable situations, frustration, fear, and anxiety developed as evidenced by either observation of subject behavior, or by subject verbalization. If uncontrollability was permitted to continue, the subjects tended to refrain from avoidance behavior and rather accept this new state of being. It is at this state of acceptance that a subject's emotional state is modified and situational helplessness develops. Since the negative emotional state of helplessness tends to arouse fear and depressive symptoms, the ability to avoid helplessness would therefore evade these conditions (Seligman, 1975).



Figure 1 below represents the Learned Helplessness Theory. It is this theory that will be used to guide this study of helplessness and depressive symptoms in patients following AMI. As an individual experiences situational factors, such as stress, challenge, and unfavorable situations, the individual is prompted to institute an action to modify the situation. The failure of such an action to change the undesired stimulus creates the perception of situational based response-outcome independence. The individual experiences negative effects to motivation, cognition, and emotion that through repeated failed attempts to manipulate the undesired stimulus, leads to a state of learned helplessness (Seligman, 1975).

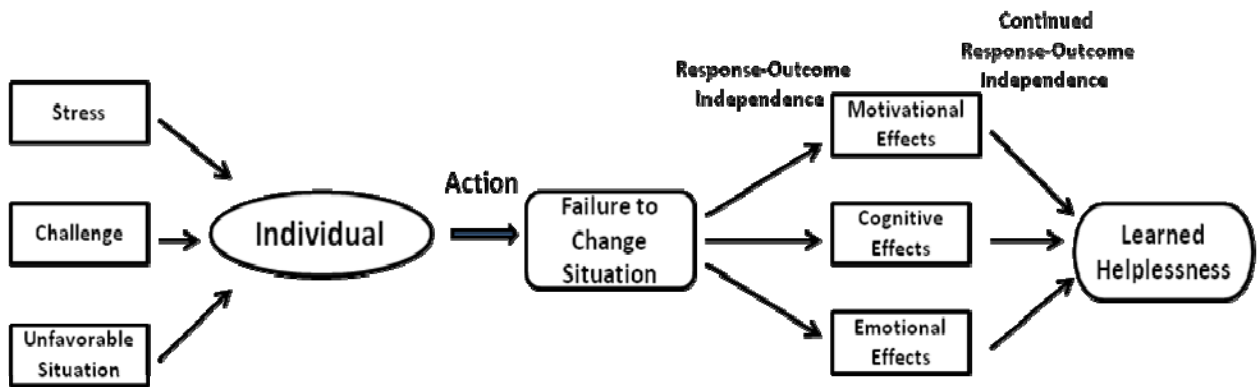


Figure 1. Diagram of Learned Helplessness Theory

### The Evolving Concept of Helplessness

The conceptualization of helplessness has changed as a result of mounting empiric evidence. Miller and Seligman (1975) defined it as “the interference with escape/avoidance learning, produced in a variety of situations with different types of uncontrollable, aversive events, and in a wide variety of species” (p. 228). In comparison, Hiroto (1975) used the definition “the interference with instrumental responses following inescapable aversive

events” (p. 311). With the introduction of the concept of helplessness in hospitalized individuals, Raps and colleagues (1982) further defined helplessness as “a reaction to loss of control that involves cognitive, motivational, and emotional deficits following the expectation that responses and outcomes are independent of each other” (p. 1036). At present, investigators and clinicians generally define helplessness as the psychological state that results from a situation in which responses occur not as a result of actions by a person, but uncontrollably from an individual’s standpoint (Henkel, Bussfeld, Möler, & Hegerl, 2002; Schneider, 1980).

Following the introduction of the Learned Helplessness Theory and ensuing research, the conceptual understanding of helplessness has grown. What was once thought of as a phenomenon associated with animal behavior (Braud, 1969; Maier, 1975; Overmier, 1967, 1968; Padilla, 1970; Seligman, 1975; Seward, 1967; Seligman, 1967) is now recognized as a significant factor associated with psychological distress in humans. The relationships among helplessness, fear, anxiety, and depressive symptoms and other forms of psychological morbidity continue to be studied in a variety of populations and clinical situations (e.g., chronic pain, epilepsy, rheumatoid arthritis, general medicine) in hopes of further understanding relationships to optimize psychological health and general well-being.

Role of Perception in Helplessness. Perception denotes a knowledge, or judgment, of a situation. Additionally, it involves the acquisition of knowledge and the further application of that knowledge in the development of an individual’s own matrix of beliefs in response to his or her own lived experiences (Collins, 1967). An individual’s matrix of beliefs can be thought of as the knowledge and logic believed by the individual to be true. This collection of beliefs stems from his or her interpretations of lived experiences and cognitive knowledge

as understood by them (Liau, 2004). The application of these beliefs is essential for the interpretation of knowledge and the environment. An individual perceives aspects of his or her environment not through the lived experience of his or her surroundings, but through the application of knowledge and cognitive understanding of what is being seen. An individual must be aware of, and believe in, what he or she perceives for it to become interpreted as real (Collins, 1967).

The role of perception in helplessness enables the recognition and explanation of events surrounding an individual's inability to alter situational outcomes of personal events. Within an individual's own matrix of subjective beliefs, multiple failed attempts of escape/avoidance behavior are not necessary for the perception of helplessness to develop. The individual, however, must only believe he or she has no influence on personal events. Furthermore, this belief does not have to be directly related to the present situation, but may be a cumulative effect (i.e., habituated) from other life experiences. This state of belief, related to an inability to effect a change is a defining factor of perceived helplessness (Collins, 1967; Miller & Seligman, 1975; Hiroto, 1975).

Perceived helplessness can thus be conceptualized as the psychological state resulting when an individual recognizes that he or she cannot alter outcomes of personal events despite his or her own interventions. Further, perceived helplessness is a state of belief of being unable to effect a change that is not dependent on multiple failed attempts of escape/avoidance. In individuals who have experienced AMI, it is the individual's belief of being unable to effect a change in the situation that leads to feelings of perceived helplessness within the patient's own matrix of beliefs of his or her heart disease.

Learned Component of Helplessness. In contrast to perceived helplessness discussed above, learned helplessness is dependent on interference with escape/avoidance learning following repeated, but failed, attempts at manipulating a situation. As the individual repeatedly fails to effect a change in a situation, the individual learns of his or her response-outcome disconnect. The eventual outcome of this interference with learning is the impairment of behavior to escape or avoid situations interpreted by the individual to be undesirable.

The learned component of helplessness arises following multiple failed attempts to influence outcomes surrounding a situation. Escape/avoidance behavior is used to manipulate an individual's emotional reaction to his or her situation (Maier, 1976). When the outcome is different from that which was expected, however, the individual learns an expectation of response-outcome independence (i.e., the outcome the individual hopes will occur based on his or her action is not the outcome that actually occurs). As this expectation is repeated with continued failed attempts at manipulating the situation, the individual learns he or she is unable to effect a change leading to diminished attempts of controllability or predictability surrounding the situation. As this learned component strengthens, the individual's ability to learn from the environment and other situations becomes impaired. This state of learning one's inability to effect a change is a defining factor of learned helplessness.

In summary, the perceived and learned components of helplessness are both related to an individual's inability to control or predict a situation and lead to emotions of being unable to effect a change in a situation. Perceived helplessness denotes a state of belief of being unable to effect a change that is not dependent on multiple failed attempts of

escape/avoidance. In contrast, learned helplessness is dependent on interference with escape/avoidance learning following repeated, but failed, attempts at manipulating a situation. In individuals who have experienced AMI, ongoing perception of being unable to effect situational change over time and across situations leads to feelings of helplessness. This psychological state is related not only to events surrounding the individual's myocardial event, but also from within his or her own matrix of beliefs from other aspects of his or her life. The transitive nature of helplessness may thus contribute to potential habitual patterns of impaired behavior (e.g., behavioral disengagement), and other aspects of the individual's general well-being are at risk of being affected. Ultimately, cognition and emotions not originally associated with the AMI may be negatively affected.

Cognitive Mediators of Health Outcomes. A cognitive mediator is a phenomenon that helps explain how external physical events take on internal psychological significance. Cognitive mediators are often viewed as being both a consequence of an action and the cause of an outcome (Baron & Kenny, 1986; Cole & Turner, 1993). Through the process of cognitive mediation, the cognitive mediator is the phenomenon responsible for the cause-and-effect relationship between the event, or task, and the outcome. For a phenomenon to function as a mediator, it must both be affected by the cause of the outcome in question as well as influence the outcome itself. When the mediator is removed, however, a previously significant relationship between the cause and outcome is no longer significant, or may completely cease to exist.

Many psychological factors have been identified in the literature as being associated with individuals who have experienced depressive symptoms following AMI. Some of these factors include perceived social support, perceived self-efficacy, and perceived control.

Perceived social support refers to an individual's believed degree and quality of intimate social ties, such as marital status, cohabitation, availability of social network size, frequency of social activity, and group membership (Burg et al., 2005). Increased perceived social support has been found to predict survival and has been linked with mortality in patients after AMI. Low perceived social support has been found to predict medical outcomes, independent of medical co-morbidities and other related conditions (Burg et al., 2005). The removal of perceived social support as a cognitive mediator would dramatically reduce the strength of the relationship between patients who are post-AMI and outcomes (Burg et al., 2005).

Self-efficacy is a psychological mechanism that has been shown to mediate physiologic outcomes and health-related behavior (Bandura, 1991). Perceived self-efficacy represents an individual's perception of how capable he or she is of performing a specific activity or task, predicts whether a specific activity will be attempted, and determines how long the individual will persevere in the face of significant challenges (Coyne & Smith, 1994; Gardner, McConnell, Klinger, Herman, Hauck, & Lauback, 2003). Perceived self-efficacy also relates to an individual's process of deciding what response he or she will take, how much effort will be put forth, and how much stress will be experienced (Bandura, O'Leary, Taylor, Gauthier, & Gossard, 1987). An individual's level of self-efficacy predicts whether a specific activity will be attempted. In individuals affected by AMI, higher levels of self-efficacy independently predicted adherence to exercise regimens and dietary recommendations, and demonstrated a greater functional capacity during cardiac rehabilitation (Gardner, 2003). When perceived self-efficacy as a cognitive mediator is analyzed in patients who have experienced AMI, improved patient outcomes as related to

mortality, quality of life, and functionality are observed in the presence of increased self-efficacy (Coyne, 1994; Gardner, 2003). When controlling for self-efficacy, the relationships among these various factors are dramatically reduced.

Perceived control refers to an individual's belief that his or her behavior can control the likelihood of a desired outcome (Rotter, 1954). Whether the individual believes his or her behavior can influence the likelihood of receiving the desired outcome or that the situation is highly dependent on luck, chance, fate, or powerful others determines if an internal or external locus of control is perceived (Wallston, Wallston, Smith, & Dobbins, 1987).

In viewing perceived control as a cognitive mediator, the relationships among the perception of control, helplessness, anxiety, depressive symptoms, and fatigue have been examined in individuals receiving chemotherapy (Wallston, 1991), individuals who are critically ill (Moch, 1988), and individuals who are status post-AMI (Moser, 2002). In each circumstance, as patients perceive having a higher level of control over the treatment regimen related to their hospitalization, reports of helplessness, anxiety, depressive symptoms, and fatigue decreased. Controlling for the cognitive mediator of perceived control, however, dramatically reduced the experiences of these psychological and physiologic outcomes.

Helplessness has been shown to mediate a variety of outcomes, such as depressive mood, self-reported pain behavior, and fatigue severity, in patients with rheumatoid arthritis (Smith, Christensen, Peck, & Ward, 1994; Smith, Peck, Ward, 1990), multiple sclerosis (van der Werf, Evers, Jonger, & Bleijenberg, 2003), and fibromyalgia (Nicassio, Schuman, Radojevic, & Weisman, 1999). In these studies, individuals' perceptions of helplessness were examined as a cognitive mediator of pain-related outcomes and quality of well being

(Nicassio, 1999), emotional instability and neurological impairment (van der Werf, 2003), cognitive distortion (Smith, 1994), and disease severity (Smith, 1990). The results from these studies indicated that helplessness mediated the relationship between the independent and dependent variable, significantly contributing to subjects' experience of fatigue, depressive mood, and self-reported pain behavior. When removed from the analyses, the relationships among perceived helplessness, fatigue, depressive mood, and self-reported pain behavior were dramatically decreased and frequently failed to achieve statistical significance. Smith and colleagues (1994), however, found that helplessness did not contribute significantly to the relationship between cognitive distortion and depressive symptoms in individuals who had rheumatoid arthritis. The authors cited a small sample size and a low internal consistency of their scales as a potential explanation of these findings.

In individuals who have experienced AMIs, a variety of post-AMI perceptions throughout the recovery process have been observed despite similar personal and clinical factors. Some patients will demonstrate a high degree of determination to participate in and influence recovery, while others will revert to previous activities identified as damaging. Still others will perceive they are unable to influence individual outcomes (Krantz, 1980). Individual outcomes have been evaluated following hospital discharge on the basis of patient mortality and the occurrence of associated psychological outcomes such as depressive mood, anxiety, perceived control, emotional distress, and quality of life (Moser, 2002; Riegel, 1998; Siegrist, 1987).

In studies of perceived helplessness in post-AMI patients, positive correlations have been shown to exist with the psychosocial factors discussed above (Agarwal, 1995; Cherrington, 2004; Condon, 2006; Jensen, 2003; Johansson, 2003; Johnson, 1990; Levy,



1981; Moser, 1995, 1996, 2002; Riegel, 1998; Siegrist, 1987). Additionally, the results of other studies have demonstrated negative correlations between psychological outcomes such as depressive mood and perceived quality of life and mortality (Denollet, 1998; Frasure-Smith, 1991, 1993; Ladwig, 1994). However, the relationship of helplessness as a cognitive mediator of psychological outcomes in post-AMI patients has not been investigated. The potential benefit of identifying helplessness as a cognitive mediator of health outcomes, such as depressive symptoms in patients who have experienced an AMI, would provide healthcare professionals with a point of intervention in the post-AMI plan of care. By doing so, the 6-month and 12-month mortality rates may be improved through psychological evaluation and intervention as part of a patient's cardiac rehabilitation and follow-up visits with the cardiologist.

#### Theoretical Synthesis of Helplessness in Patients with AMI

The theoretical literature provides a variety of means for understanding the concept of helplessness. Social-Learning Theory (Rotter, 1954), Learned Helplessness Theory (Maier & Seligman, 1976), and Social Cognitive Theory of Self-Regulation (Bandura, 1991) all have been used in studies with a primary focus on helplessness. Regardless of the theory used, a commonality is that an individual perceives a disassociation between his or her actions and the desired outcome, which creates feelings of frustration, uncontrollability, and unpredictability. Rotter (1954) outlines such a disassociation using the concepts of behavior potential, reinforcement value, psychological situations, and expectancy in conjunction with internal and external locus of control to describe the prospect of behaviors to bring about specific responses. For example, when an individual perceives the desired behavior will not

lead to the desired outcome, or the desired outcome is attributed to luck, chance, fate, or powerful others, perceived helplessness can occur.

Seligman and Maier (1976) describe the significance of repeated failure to influence outcomes to the development of a learned expectation of response-outcome independence. As a result, the individual's likelihood of attempting to initiate a response is reduced and learning is impaired. With the impairment of learning, the subject fails to attempt new and creative ways to influence his or her surroundings and the perception of helplessness develops.

Bandura (1991) describes self-directed change using a cognitive structure consisting of an emotional response pathway and a functional response pathway. Through a series of re-evaluations, failure of either pathway to promote self-directed change facilitates the perceptions of frustrations, uncontrollability, and unpredictability, leading to a sense of helplessness.

Despite these theories' inadequacies to directly address the concept of helplessness, perception is a key assumption common to each theory, guiding the individual's response to interactions with the environment. It is through these responses by the individual and the belief in an inability to effect change that helplessness is experienced. Additionally, these theories all rely on prior experiences to provide a cognitive basis for responding to the current situation. In the event that the experience at hand (i.e., AMI) is one that has never been experienced by the subject, difficulty may be experienced in utilizing and justifying the use of theories for the discussion of perceived helplessness that assume the subject experienced multiple events. It is for these reasons that the Learned Helplessness Theory will be used to guide the theoretical framework of this study.

## Methodological Synthesis of Helplessness in Patients with AMI

Results of animal experimentations became applicable to human subjects by the sentinel work of Thornton and colleagues (1971). The theoretical models of Social-Learning Theory (Rotter, 1954), Learned Helplessness Theory (Maier, 1976; Seligman, 1975), and Social Cognitive Theory of Self-Regulation (Bandura, 1991) provided the structure within human subjects to further explore perceived helplessness beyond the realm of shuttle boxes and electric shocks. Since the time of Thornton's groundbreaking work, the concept of helplessness has received attention in widely diverse populations both within and outside of the medical community and has spanned numerous cultural and ethnic backgrounds.

A search of the literature was conducted using the CINAHL, PubMed, and MEDLINE databases between the years of 1970 and 2008. Search terms used included "helplessness" and "myocardial infarction" or "heart attack." This search yielded 21 research articles.

Several different research designs have provided the methodological basis for these studies, including qualitative ( $n=2$ ), pre-experimental ( $n=5$ ), quasi-experimental ( $n=8$ ), experimental ( $n=2$ ), and mixed methods ( $n=4$ ). Self-administered scales constitute the majority of instruments used to measure perceived helplessness and related concepts. A number of studies used questionnaires that were constructed by the specific researchers of a study (Agarwal, 1995; Benight, 1997; Endermann, 1997; Ladwig, 1994). These questionnaires had weak reliability (Cronbach's  $\alpha < 0.7$ ) and weak construct and discriminate validity ( $r < 0.2$ ). Additionally, one visual analog scale also is found in the literature (Byrne, 1980). This type of scale tends to have high construct validity ( $r = 0.81-0.906$ ) (Cork et al., 2004; Ohnhaus & Adler, 1975); however, this mode of measurement

lends itself to differences in the interpretation of physical space. A major advantage of visual analog scales is their ability to potentially detect effects that may not produce a shift on a 5-point scale. Additionally, when visual analog scales are repeated over time, it is difficult for subjects to replicate past responses with a high degree of accuracy (DeVellis, 2003).

Many of these scales are of considerable length (i.e., greater than 20 items), and, when used in combination with other measures, produce a potentially burdensome instrument set that is very time consuming. Self-administered Likert scales also require a certain level of literacy and comprehension that can alienate some subjects who might be able to contribute significant research data. In general, visual analog scales and faces scales, though seldom used, require minimal levels of literacy and comprehension while providing a highly sensitive means of obtaining subjective data (DeVellis, 2003).

One study used positron emission tomography (PET) scans in an attempt to correlate increased levels of anger and helplessness in patients diagnosed with coronary artery disease with decreased myocardial perfusion. What was found, however, was an increase of coronary perfusion, suggesting increased mortality in angry and helpless individuals recovering from AMI is not caused by a decrease in coronary perfusion in an acute setting.

Within the past five years, few studies have been published evaluating the concept of helplessness within the AMI population. Limited research evidence has been disseminated pertaining to the lived experience of AMI patients in the acute setting and immediately following hospital discharge. Longitudinal studies showing the long-term effects of helplessness within the AMI population tended to focus on 6- to 12-month AMI outcomes. This methodological approach stemmed from previous data suggesting the majority of deaths following a heart attack occur during this time period (Frasure-Smith, 1993; Ladwig, 1994;

Moser, 1995). The majority of studies used a cross-sectional, descriptive, correlational design to examine the perceptions of helplessness with other related factors, such as depression (Ahern, 1990; Burns, 2003; Cherrington, 2004; Denollet, 1998; Dykema, 1996; Miller, 1975; Raps, 1982), anxiety (Ahern, 1990; Cherrington, 2004; Denollet, 1990; Miller, 1975; Moser, 1995, 1996), perceived control (Agarwal, 1995; Doerfler, 2005; Moser, 1995; Rankin, 2002), hostility and anger (Ahern, 1990; Benight, 1997; Denollet, 1998), and quality of life (Doerfler, 2005; Fowers, 1994). Such approaches, however, neglect to evaluate the influence of time of psychological stability on patients who have had an AMI.

Across the body of literature, the relationship between helplessness and health related outcomes remains generally unexplained. Early studies support the existence of helplessness among individuals with extension of its effects to related disciplines outside psychology. Instruments have been developed to measure helplessness, and these instruments have been adapted for use in a variety of clinical population. Within the AMI population, factors such as depressive symptoms, anxiety, perceived control, hostility, and anger have been heavily studied and shown to correlate with patient survival and mortality. Many of these related concepts can be detected during a patient's hospitalization for AMI or immediately following discharge. Several studies of individuals who have had an AMI have incorporated tools to detect and correlate helplessness with other factors associated with morbidity and mortality (e.g., depression, quality of life, social support, associated co-morbidities). Helplessness, however, has failed to achieve the same degree of independent recognition within the AMI research literature as these other factors have.

By building on the research knowledge of helplessness in patients who have had an AMI, an additional avenue of treatment may be open to further support the psychological

outcomes of patients receiving a potentially life altering medical diagnosis. Current therapeutic interventions and plans of care emphasize physiological status and outcomes. The realm of psychological health has been neglected during the acute phase of illness, predisposing this patient population to psychological experiences shown to increase mortality. Interventions specific to psychological health in combination with physiologic interventions will more effectively provide holistic care and potentially improve the survival rates of patients who have had an AMI.

Thornton and colleagues' (1971) work provided an entry for the study of helplessness in human subjects from the previously exhaustive list of animal studies that had been published. Since that time, diverse populations and multiple study designs have been used to examine the effects of perceived helplessness. Perceived helplessness has been moderately evaluated in patients who have experienced AMI. In addition, correlational studies between depressive symptoms and a wide variety of other concepts have established the impact of perceived helplessness on patient outcomes. Perceived helplessness has not, however, been studied as a cognitive mediator of depressive symptoms in patients with AMI. By doing so, a more defined means of improving patient outcomes during the first six months following an AMI may be identified.

### Conceptual Model

A review of the theoretical and empirical literature suggests that cognitive factors such as an individual's perception of helplessness, social support and self-efficacy impact the development of depressive symptoms in a range of medical diagnoses (e.g., chronic pain, epilepsy, and rheumatoid arthritis) (Areán, 2005; Burns, 2003; Endermann, 1997; Nicassio, 1985). The development of depressive symptoms in AMI patients also has been shown to

influence outcomes such as cardiac-related mortality and re-hospitalization (Dracup, 2003; Frasure-Smith, 1993; Moser, 1995). The concept of helplessness, however, has not been shown to be a mediator of depressive symptoms in the AMI population. This gap in the literature presents an opportunity for examination of the relationships among helplessness, social support, and self-efficacy and depressive symptoms in patients following AMI.

The proposed conceptual model depicted below builds on the Learned Helplessness Theory by further suggesting that health-related outcomes (such as depressive symptoms) in individuals who have experienced AMI result from a combination of clinical factors (e.g., comorbidities and number of previous AMI) and psychosocial factors (e.g., helplessness, perceived social support, and perceived self-efficacy). Figure 2 depicts these hypothesized relationships.

Although all the research hypotheses are illustrated, this pictorial representation of possible linkages among perceived social support, self-efficacy, helplessness, clinical factors, and depressive symptoms goes beyond the bivariate relationships depicted in Figure 2. This model also depicts assumptions about possible multivariate relationships. The testing of causal relationships is beyond the scope of the proposed associational design in this dissertation research study and there is no firm basis for the multivariate relationships that can be identified in Figure 2. Thus, current understanding of these phenomena makes it difficult to identify an actual theoretical model. Therefore, Figure 2 is not to be interpreted as a theoretical model per se, but rather it is to be viewed as one possible conceptual representation of the research hypotheses. One of the primary goals of this dissertation research, therefore, is to determine the cross-sectional nature of these relationships and move

towards an improved theoretical understanding of psychosocial factors (including helplessness) and depressive symptoms in individuals who have experienced an AMI.

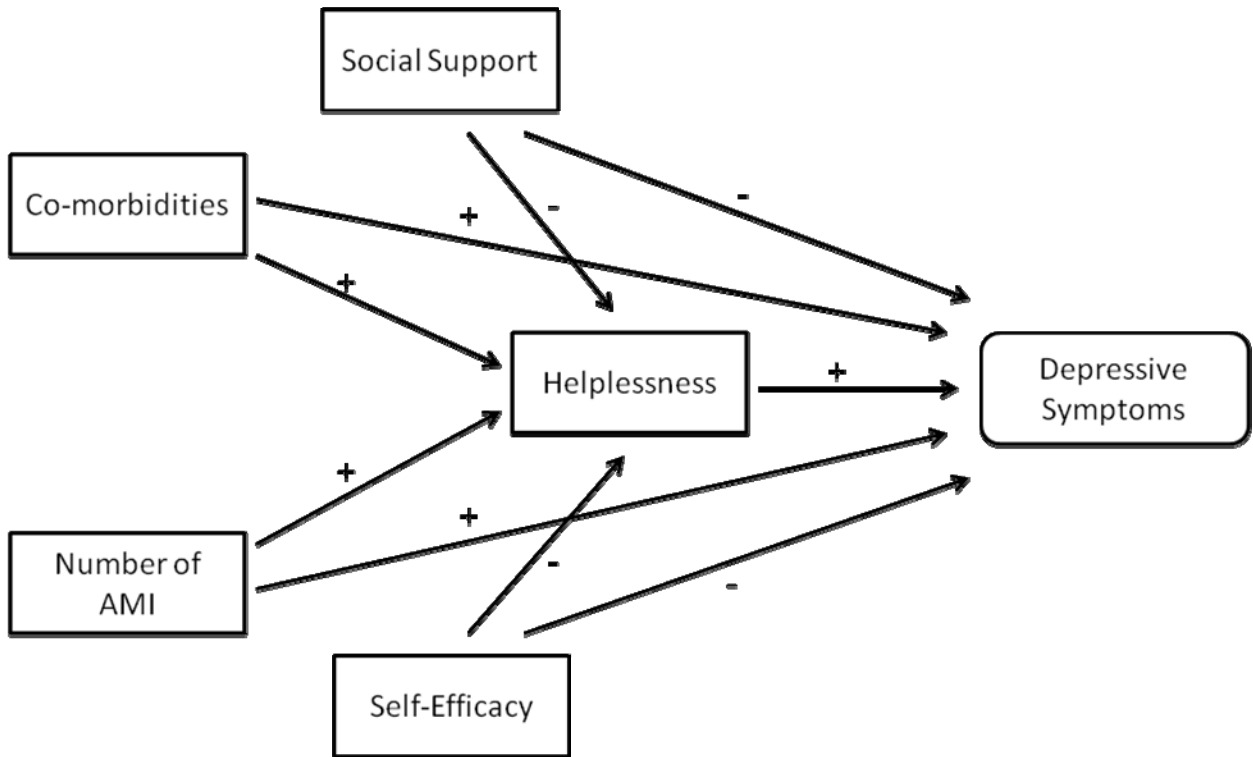


Figure 2. Conceptual Model of Helplessness and Depressive Symptoms Following AMI

### Hypotheses

Based on a synthesis and understanding of the literature relating to helplessness, social support, self-efficacy, and depressive symptoms in individuals experiencing AMI, variables are predicted to influence depressive symptoms in individuals following their AMI. The following aims and hypotheses depict the relationships that will be examined in this dissertation research study.



Specific Aim 1: Examine the relationship between helplessness and depressive symptoms in patients who have experienced an AMI.

Hypothesis 1: There will be a direct, positive relationship between helplessness and depressive symptoms.

Specific Aim 2: Examine the relationship between clinical and psychosocial factors, helplessness, and depressive symptoms.

Hypothesis 2a: Increased number of AMI events and increased number of co-morbidities will have a positive association with helplessness and depressive symptoms.

Hypothesis 2b: Increased social support and increased self efficacy will have a negative association with helplessness and depressive symptoms.

### Summary

The concept of helplessness has dramatically evolved since its introduction in 1965. What was once believed to be a learned response in animals has been shown to be a psychological phenomenon in humans. The Learned Helplessness Theory helps to identify precipitating factors (e.g., motivational, cognitive, and emotional) that contribute to an individual's perception of response-outcome independence of a situation he or she is experiencing. This situational experience of helplessness has the potential of not only becoming habitual with repeated experiences of response-outcome independence, but affecting other aspects of an individual's life, including recovery from multiple medical diagnoses, including AMI. Psychological factors (e.g., self-efficacy, social support, and perceived control) impact the extent to which an individual experiences depressive symptoms following an AMI; however, an individual's sense of helplessness following an AMI has yet to be investigated as another psychological factor contributing to patient outcomes. The

Learned Helplessness Theory is proposed as a theoretical framework to guide the conceptualization of this study examining the effects of helplessness on depressive symptoms in patients following AMI.

## CHAPTER III

### METHODOLOGY

The purpose of this chapter is to discuss the chosen research design, identify the concepts of interest, intended sample population, and inclusion and exclusion criteria. Additional discussion will be provided to discussion data collection methods, the instruments utilized, and the procedures followed for data collection.

#### Design

This study used a descriptive, correlational, cross-sectional design to examine the proposed relationships among study variables. Data were collected at one time point and initial contact was coordinated with a visit to the patient's cardiologist. Study participants were recruited from two comprehensive heart institutes located within the southeastern United States. Individuals referred to either of the heart institutes with a history of AMI were asked about study participation by a clinical nurse or physician while attending either an initial appointment or follow-up clinic visit. Once an individual agreed to participate in the study, informed consent was obtained. The sample size ( $N = 123$ ) required for the anticipated analyses was based on a power analysis specifying a small to moderate effect size for the proposed relationships among study variables,  $R^2$  of 0.25, power of 0.80, and alpha level of 0.05. A sample size of  $N = 84$  would produce  $R^2$  of 0.30, power of 0.80, and alpha level of 0.05. A sample size of  $N = 69$  would produce  $R^2$  of 0.33, power of 0.80, and alpha level of 0.05.

## Definition of Terms

Helplessness. In this study, helplessness was defined as learned helplessness. Learned helplessness is a potential human response to a variety of psychological, physiological, and sociological experiences resulting from an inability to influence the outcomes of events felt to be significant to an individual (Collins, 1967; Seligman, 1975). Learned helplessness is dependent on interference with escape/avoidance learning following repeated, but failed, attempts at manipulating a situation. As an individual repeatedly fails to effect a change in a situation, the individual learns of his or her response-outcome disconnect. The eventual outcome of this interference with learning is the impairment of behavior to escape or avoid situations interpreted by an individual to be undesirable.

Depressive Symptoms. Depressive symptoms were defined as a symptom cluster affecting an individual both cognitively and physically. When lasting for more than two weeks, depressive symptoms involve the body, mood, and thoughts, and affect the way a person eats, sleeps, feels about himself or herself, and the way he or she thinks about things. Depression is typically characterized by symptoms such as dysphoria, loss of interest, altered appetite, sleep disorders, psychomotor changes, fatigue, worthlessness, hopelessness, helplessness, and impaired cognition (American Psychological Association, 2000).

Perceived Social Support. Perceived social support was defined as an individual's self-perception of his or her degree and quality of intimate social ties, such as marital status, cohabitation, availability and size of social network, frequency of social activities, and group membership (Burg et al., 2005). Social support captures the qualitative aspects of such social interactions providing meaningful relationships with other individuals.

Perceived Self-Efficacy. Perceived self-efficacy was defined as an individual's perception of how capable he or she is of performing a specific activity or task, whether a specific activity will be attempted, how much effort will be put forth, and how much stress will be experienced (Bandura, 1987; Coyne, 1994; Gardner, 2003). An individual's level of self-efficacy predicts whether a specific activity will be attempted and may lead to an erosion of positive attitudes and an increase in the occurrence of depressive disorders (Waltz, 1988).

### Sample and Sampling Plan

The target population was all individuals with a diagnosis of AMI within a 12 month timeframe from the point of data collection. AMI must have been confirmed either through standard laboratory values of creatine kinase-MB and/or troponin or cardiac catheterization. creatine kinase-MB and Troponin are the preferred laboratory value based on their specificity and concentration within myocardial muscle. Small amounts of creatine kinase-MB are present in skeletal muscle; however, there is a higher percentage of creatine kinase-MB in cardiac muscle (Adams, 1994). In the presence of concomitant injury of skeletal muscle, these values may not be as sensitive as preferred. For this reason, troponin I levels were also used to determine AMI. Troponin I is a protein, found in cardiac and skeletal muscles, that binds to actin in thin myofilaments to hold the troponin-tropomyosin complex in place. When cardiac muscle becomes necrotic during an AMI, Troponin I along with creatine kinase-MB are released into the blood circulation (Adams, 1994). For the purposes of this dissertation research, the cardiac specific isoform of troponin is of particular interest. Serum concentrations of these two substances have been shown to be highly specific and reliable in diagnosing AMI (Adams, 1994). Electrocardiogram, though beneficial in many instances, does not always confirm AMIs that are characterized as non-ST elevating myocardial

infarction. For this reason, cardiac catheterization and laboratory data were the primary means for confirming AMI diagnosis.

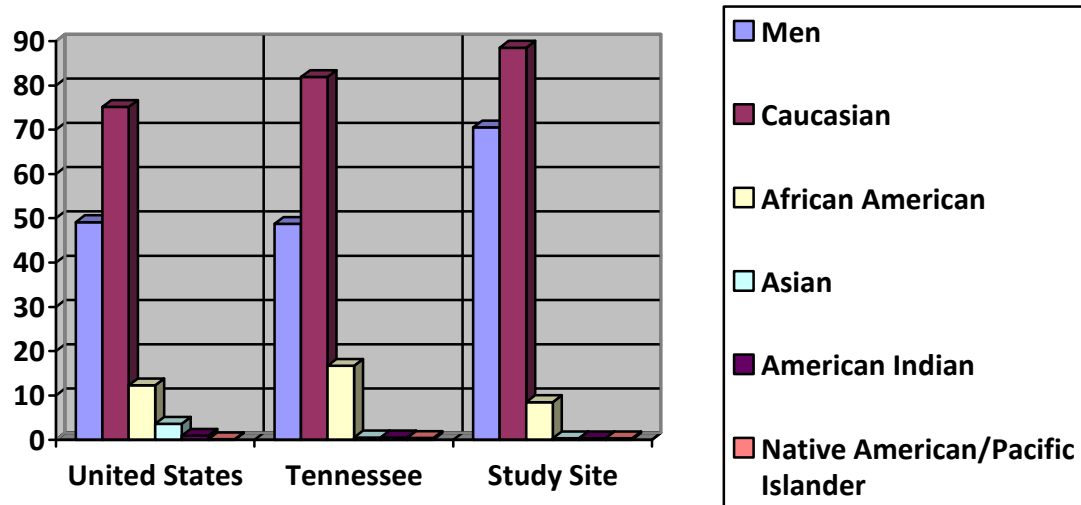
Based on information from the U.S. Census Bureau regarding the year 2000 census, men composed 49.1% of the U.S. population, and the overall racial/ethnic distribution was 75.1% Caucasian, 12.3% African American, 3.6% Asian, 0.9% American Indian, and 0.1% Native Hawaiian and Pacific Islander. Age distribution was 20.9% between the ages of 20 and 34 years, 29.4% between 35 and 54 years, 8.6% between 55 and 64 years, 10.9% between 65 and 84 years, and 1.5% greater than 85 years of age (U.S. Census Bureau, n.d.).

In the year 2000, the state of Tennessee estimated statewide statistics having 48.7% men, and the overall racial/ethnic distribution was 81.9% Caucasian, 16.7% African American, and 1.4% other races. Age distribution was 27.9% between the ages of 20 and 34 years, 29.7% between 35 and 54 years, 9.4% between 55 and 64 years, 10.9% between 65 and 84 years, and 1.4% greater than 85 years of age (Tennessee Department of Economic & Community Development, n.d.). These demographic data show a minimal degree of variability between the U.S. and the state of Tennessee. Table 3 contains the demographic information for the U.S. as compared with that of the state of Tennessee from the 2000 census. Demographics of patients at the study site in the year 2008 showed 70.5% men, and the overall racial/ethnic distribution was 88.5% Caucasian, 8.5% African American, 1.5% Hispanic, and 1% other races. The median age represented was 61.5 years, with 20% of patients being greater than 75 years of age.

Based on these demographic data, the accessible population within the study site was believed to be moderately representative of not only statewide demographics but also

national demographics. Table 3 presents a graphic representation of National demographics compared with state and study site demographics.

Table 3. Demographic Data of Study Site Compared with the state Tennessee and the United States



Inclusion criteria for this dissertation study included: (1) at least 18 years of age; (2) met diagnostic criteria for AMI; (3) ability to speak and understand English; (4) diagnosis of AMI within 12 months of the date of data collection.

Exclusion criteria of potential subjects were: (1) failure to obtain a confirmed diagnosis of AMI by CK-MB and/or troponin or interventional cardiac catheterization; (2) unable to speak and understand the English language; (3) a diagnosed history of psychological illness, including depression, at the time of the individual's most recent AMI.

## DATA COLLECTION METHODS

### Demographic and Clinical Data

Following informed consent, subjects received a demographic questionnaire that included birth date, gender, race, educational level, relationship status, and estimated yearly household income. Clinical data were obtained from the individual's electronic medical record. This information included admission diagnosis, date of diagnosed AMI, date of discharge, number of days from presentation of AMI symptoms to point of data collection, past medical history/co-morbidities, diagnostic results from cardiac catheterization, cardiac enzyme values, and number of previous myocardial infarctions experienced. Co-morbidities of interest were those identified by the American Heart Association (2008) as modifiable (i.e., tobacco abuse, high blood cholesterol, high blood pressure, obesity, diabetes mellitus) and un-modifiable (i.e., increased age, gender, and heredity).

### Instruments

In addition to the demographic questionnaire, subjects were asked to complete the Learned Helplessness Scale (LHS) (Quinless & Nelson, 1988), Beck Depression Inventory-Second Edition (BDI-II) (Beck, Steer, & Brown, 1996), Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet, & Farley, 1988), and the Cardiac Self-Efficacy Scale (CSE) (Sullivan, LaCroix, Russo, & Katon, 1998). These scales were selected based on their validity and reliability demonstrated through published psychometric values, the brevity of each instrument, and relevance to the phenomenon of interest. The desire to evaluate the concepts of depressive symptoms and social support was based on support from the literature identifying a strong correlation between these concepts and helplessness. The



literature, however, was unclear as to whether learned helplessness precedes depression, or is a consequence of learned helplessness. This inconsistency had the potential for affecting ways in which healthcare disciplines treat such psychosocial experiences.

Helplessness. Helplessness was measured in this dissertation research study using the Learned Helplessness Scale (LHS) (Quinless & Nelson, 1988). (Appendix A) The LHS has received minor modifications for its application to varied populations. The LHS is a 20-item, 4-point Likert scale strongly indicative of learned helplessness. When evaluating the original LHS, correlations were determined with Beck's Hopelessness Scale ( $r = 0.252$ ), Rosenberg's Self-Esteem Scale ( $r = -0.622$ ), and alpha reliability = 0.85. Factor analysis also was used to determine content, criterion, and construct validity. Varimax-rotated factor analysis produced five factor loads greater than 0.45, indicating at least a 20% overlap in variance between the variable and the factor. Factor 1 contained five items and was labeled Internality-Externality. Factor 2 contained five items and was labeled Globality-Specific. Factor 3 contained six items and was labeled Stability-Instability. Factors 4 and 5 each contained only two items; however, they were retained because of their relatedness to the concept of learned helplessness. Therefore, Factor 4 was labeled Ability-Inability to Control, and Factor 5 was labeled Individual's Choice of Situations in which the Person Intentionally Participates. Cronbach's Alpha in this sample was .947.

Depressive Symptoms. Multiple studies measured the presence of concepts related to learned helplessness. Depression is a concept that has been studied by many in attempts to examine relationships among depression and outcomes (Ahern, 1990; Burns, 2003; Cherrington, 2004; Denollet, 1998; Dykema, 1996; Miller, 1975; Raps, 1982). The Beck Depression Inventory (BDI) is a scale frequently used for this purpose (Beck, Steer, &

Garbin, 1988). Despite adequate internal consistency, test-retest reliability, construct validity, and factorial validity, the content validity of the BDI was subject to question. This dispute was based on the BDI only addressing six out of the nine DSM-IV diagnostic criteria (Dozois, Dobson, & Ahnberg, 1998). Additionally, it was criticized that the BDI should include alternatives describing increases in appetite, weight, and sleep instead of just decreases in these symptoms. Based on these points, the BDI was revised into what is now accepted as the Beck Depressive Inventory Second Edition (BDI-II). The BDI-II is a 21-item inventory that assesses symptoms related to depression, rated from 0 to 3 in terms of the intensity at which they are experienced. These depressive symptoms include sadness, pessimism, past failure, loss of pleasure, guilty feelings, punishment feelings, self-dislike, self-criticalness, suicidal thoughts, crying, agitation, loss of interest, indecisiveness, worthlessness, loss of energy, changes in sleep, irritability, changes in appetite, concentration difficulty, and tiredness or fatigue (Dozois, 1998). Although originally designed for administration by trained interviewers, the BDI-II can easily be self-administered and takes about five minutes to complete. Scores for each of the 21 items are summed to give a final score. This score is then compared to the BDI-II scale to determine the severity of depression based on its symptoms: < 13, none or minimal depression; 14-19, mild to moderate depression; 20-28, moderate to severe depression; 29-63, severe depression. When administered to samples, including college students and outpatients, a mean alpha of 0.92 was achieved (Dozois, 1998). Test-retest reliability was established at  $r = 0.93$ . Cronbach's Alpha in this study was 0.94. Due to copyright laws, a replication of the BDI-II was unable to be included in the appendix of this dissertation.

Perceived Social Support. Perceived social support was measured by the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet, & Farley, 1988) (Appendix B). The MSPSS was developed to complement other social support scales already in existence. It addresses the subjective assessment of social support adequacy from the three specific sources: family, friends, and significant others (Zimet et al., 1988). The MSPSS consists of 12 items that are rated by study participants on a 7-point Likert scale, with scores ranging from very strongly disagree (1) to very strongly agree (7). A benefit to using the MSPSS includes its psychometric qualities. Cronbach's alpha has been calculated at  $\alpha = 0.88$  (Zimet et al., 1988). Test-retest reliability was calculated at  $r = 0.85$  (Zimet et al., 1988). Additionally, it is self-explanatory, brief, and simple to use, making it highly useful when administering a number of measures. Cronbach's Alpha for the Significant Other subscale in this study was 0.954. Cronbach's Alpha for the Family subscale in this study was 0.943. Cronbach's Alpha for the Friends subscale in this study was 0.891. Cronbach's Alpha for the total MSPSS scale in this study was 0.926.

Perceived Self-Efficacy. Perceived self-efficacy was measured by the Cardiac Self-Efficacy Scale (CSE) (Sullivan, LaCroix, Russo, Katon, 1998) (Appendix C). The CSE was developed to evaluate the relationship between the physical symptoms and disabilities in cardiac patients after controlling for the effects of demographic factors, disease severity, depression, and anxiety. The CSE is a 13 item scale consisting of two subscales: Control Symptoms subscale (eight items) and Maintain Function subscale (five items). Study participants are asked to rate each statement on a 5-point Likert scale with scores ranging from not at all confident (0) to completely confident (4). The score for each of these subscales is the mean of the items for the scale. The higher the sum of the subscale scores,

the greater self-efficacy experienced by the subject. The 13 items were evaluated using an orthogonal factor analysis and yielded two factors explaining 66.7% item variance. The first factor accounted for 47.1% variance (eigenvalue = 6.13) having eight items with the second factor accounting for 19.5% variance (eigenvalue=2.54) containing five items. Cronbach's alpha for the two factors was 0.90 and 0.87 respectively, with a moderate correlation between scales ( $r=0.38$ ) (Sullivan, 1998). Cronbach's Alpha for the Control Symptoms subscale in this study was 0.898. Cronbach's Alpha for the Maintain Function subscale in this study was 0.90. Cronbach's Alpha for the total Cardiac Self Efficacy scale in this study was 0.93.

Demographic Information Questionnaire. Demographic information of study participants was collected using a Demographic Information Questionnaire (Appendix D). Information included birth date, gender, race, ethnicity, occupation, educational level, relationship status, and estimated yearly household income.

#### Procedure

Once approved for the dissertation research was obtained from the Institutional Review Board, a single wave of data collection occurred either at a time that coincided with an initial or return clinic visit for each subject within 12 months of his or her AMI, or via telephonic at a date and time determined by the subject. Eligible adults with a history of confirmed AMI were identified and approached by a nurse or attending physician about contact with the primary investigator. After obtaining informed consent, study questionnaires were administered by the investigator in a clinic room selected for privacy. If a subject opted for a telephonic interview, a date, time, and contact number were determined. Data from participant questionnaires and demographic information were identified using an anonymous descriptor and maintained in the investigator's office in a locked file cabinet.

Study data were collected and managed using REDCap electronic data capture tools hosted at Vanderbilt University (Harris, Taylor, Thielke, Payne, Gonzalez, & Conde, 2009). REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources. All subject questionnaires and demographic information were destroyed after completion of the study.

#### Data Analysis Procedures

Data analysis was conducted using the program Statistical Package for Social Sciences (SPSS). Descriptive statistics, including frequencies, ranges, means, and standard deviations, were determined for the demographic data. Descriptive statistics for learned helplessness, social support, self-efficacy, and depressive symptoms were calculated. Descriptive correlations were then be used to analyze the hypotheses for this dissertation.

#### Summary

The study looked at the effects of helplessness, social support, self-efficacy, and clinical factors (e.g., co-morbidities and number of previous AMI) on depressive symptoms of subjects who had experienced AMI. This study used a descriptive, correlational, cross-sectional design to examine the proposed relationships among study variables. The study sites were two comprehensive heart institutes located in the southeastern United States. Study subjects were individuals in whom AMI had been diagnosed within 12 months from the date of data collection and were recruited during either an initial appointment or a follow-up clinic visit with a cardiologist. Study instruments included the Learned Helplessness

Scale, Beck Depressive Inventory- Second Edition, Multidimensional Scale of Perceived Social Support, and the Cardiac Self-Efficacy Scale. These scales were selected based on their validity and reliability demonstrated through published psychometric values, the brevity of each instrument, and relevance to the phenomenon of interest. Additionally, a review of the electronic chart and a demographic information questionnaire devised by the primary investigator of this dissertation were used to collect demographic information and clinical information pertinent to this study. The hypothesized findings included the following: 1) there will be a direct, positive relationship between helplessness and depressive symptoms; 2) increased number of AMI events and increased number of co-morbidities will have a positive association with helplessness and depressive symptoms; and 3) increased social support and increased self efficacy will have a negative association with helplessness and depressive symptoms.

## CHAPTER IV

### RESULTS

This chapter presents the results of the data analyses used to examine the research questions and hypotheses posed in this dissertation research study. Four principal sections are provided. In section one, a description of the sample is given. Section two includes the descriptive statistics for each instrument used in the study. In section three, unadjusted associations proposed in the study hypotheses are presented. Section four presents the findings from analysis of the adjusted association of learned helplessness with depressive symptoms.

#### Sample

The convenience sample of adult subjects ( $N=75$ ) was recruited from cardiology clinics located in an academic health science center ( $n=32$ ) and community hospital ( $n=43$ ) located in metropolitan Nashville, Tennessee. The demographic characteristics of the sample overall and by site of participation are summarized in Table 4.

The total sample consisted of 80% males ( $n=60$ ). In the academic center, 9.4% ( $n=3$ ) of subjects were female compared with 27.9% ( $n=12$ ) from the community hospital. Subjects ranged in age from 35 to 85 years (median=57,  $IQR=51, 67$ ). A total of 65.3% either reported being married ( $n=45$ ), or having a domestic partner ( $n=4$ ). The majority of subjects were Caucasian ( $n=68, 90.7\%$ ). Within the academic center, 40.6% of subjects were either unemployed ( $n=9; 28.1\%$ ) or disabled ( $n=4; 12.5\%$ ), while 67.5% of subjects from the community hospital reported being either unemployed ( $n=19; 44.2\%$ ) or disabled ( $n=10;$

23.3%). Overall, gender ( $p<.05$ ), highest grade completed ( $p<.05$ ), and estimated yearly household income ( $p=.001$ ) were the only demographic characteristics that showed a statistically significant difference between study sites.

Summaries of the clinical characteristics of the sample are presented in Table 5. The total length of hospital stay for the subjects experiencing a qualifying AMI within the academic center ranged from 1-15 days (median=3;  $IQR=2, 5.8$ ). This was similar to length of stay at the community hospital ranging from 1-20 days (median=3;  $IQR=2, 7$ ). Differences, though not statistically significant, were noted between the median CK-MB (median=102.4 ng/ml;  $IQR=17, 244.2$  ng/ml) and Troponin I levels (median=21.6 ng/ml;  $IQR=3.5, 59.6$  ng/ml) at the academic center compared to the CK-MB (median=59 ng/ml;  $IQR=22.2, 213.3$  ng/ml) and Troponin I levels (median=20.7 ng/ml;  $IQR=3.1, 50$  ng/ml) at the community hospital. These differences could partly be attributed to the use of different equipment within the hospital labs, and therefore different reference ranges. The median number of previous AMIs was identical between the academic center (median=1;  $IQR=1, 1$ ) and the community hospital (median=1;  $IQR=1, 2$ ). Within the academic center, 54.8% ( $n=17$ ) of subjects reported no involvement in cardiac rehabilitation and 29% ( $n=29$ ) denied utilizing a counselor or support group compared to that of the community hospital (73.8%,  $n=31$ ; 97.7%,  $n=42$ ). Overall, none of the clinical factors evaluated demonstrated a statistically significant difference between the two study sites.



Table 4. Summary of Demographic Data by Site of Participation ( $N=75$ )

	<b>Academic Center (<math>N= 32</math>)</b>	<b>Community Hospital (<math>N= 43</math>)</b>	<b>Total</b>
<b>Variable</b>	<b><i>n</i> (%)</b>	<b><i>n</i> (%)</b>	<b><i>N</i> (%)</b>
<b>Gender (<math>p=.047</math>)</b>			
Male	29 (90.6)	31 (72.1)	60 (80.0)
Female	3 (9.4)	12 (27.9)	15 (20.0)
<b>Relationship Status (<math>p=.246</math>)</b>			
Single	2 (6.3)	6 (14.0)	8 (10.7)
Married	23 (71.9)	22 (51.2)	45 (60.0)
Domestic Partner	2 (6.3)	2 (4.7)	4 (5.3)
Divorced	4 (12.5)	6 (14.0)	10 (13.3)
Widowed	1 (1.3)	7 (16.3)	8 (10.7)
<b>Race (<math>p=.668</math>)</b>			
Black/African American	2 (6.3)	3 (7.0)	5 (6.7)
White	30 (93.8)	38 (88.4)	68 (90.7)
Native Hawaiian/Pacific Islander	0 (0.0)	1 (2.3)	1 (1.3)
Other	0 (0.0)	1 (2.3)	1 (1.3)
<b>Ethnicity (<math>p=.391</math>)</b>			
Hispanic or Latino	2 (6.3)	1 (2.3)	3 (4.0)
Not Hispanic or Latino	30 (93.8)	42 (97.7)	72 (96.0)
<b>Employment Status (<math>p=.067</math>)</b>			
Employed	19 (59.4)	14 (32.6)	33 (44.0)
Unemployed	9 (28.1)	19 (44.2)	28 (37.3)
Disabled	4 (12.5)	10 (23.3)	14 (18.7)

Table 4. Summary of Demographic Data by Site of Participation ( $N=75$ ) (cont.)

<b>Highest Grade Completed (<math>p=.048</math>)</b>			
1 <sup>st</sup> -8 <sup>th</sup> grade	1 (3.1)	3 (7.0)	4 (5.3)
High School	10 (31.3)	26 (60.5)	36 (48.0)
Undergraduate Degree	15 (46.9)	13 (30.2)	12 (16.0)
Graduate Degree	6 (18.8)	1 (2.3)	7 (9.4)
<b>Estimated Yearly Household Income (<math>p=.001</math>)</b>			
0-\$20,000	1 (3.1)	21 (48.8)	22 (29.3)
\$21,000-\$40,000	9 (28.1)	11 (25.6)	20 (26.7)
\$41,000-\$60,000	6 (18.8)	4 (9.3)	10 (13.3)
\$61,000-\$100,000	9 (28.1)	5 (11.6)	14 (18.7)
\$101,000 or more	7 (22.0)	2 (4.7)	9 (12.0)
	<b>Mean (Median) IQR (Min, Max)</b>	<b>Mean (Median) IQR (Min, Max)</b>	<b>Mean (Median) IQR (Min, Max)</b>
<b>Age (years) (<math>p= .830</math>)</b>	58.3 (55) 51.5-63.7 (44, 82)	59.1 (57) 50-71 (35, 85)	58.7 (57) 51-67 (35, 85)

Table 5. Summary of Clinical Data by Site of Participation

	<b>Academic Center</b>	<b>Community Hospital</b>	<b>Total</b>
<b>Variable</b>	<b>Mean (Median) IQR (Min, Max)</b>	<b>Mean (Median) IQR (Min, Max)</b>	<b>Mean (Median) IQR (Min, Max)</b>
<b>Length of Stay (days) (<i>p</i>=.695)</b>	4.3 (3) 2-5.8 (1, 15)	5 (3) 2-7 (1, 20)	4.77 (3) 2-6 (1, 20)
<b>Time Since AMI (days) (<i>p</i>=.169)</b>	122.3 (96.5) 41-187.3 (18, 365)	114.2 (64) 9-186 (7, 363)	117.7 (79) 26-186 (7, 365)
<b>CK-MB (<i>p</i>=.562)</b>	175.2 (102.4) 17-244.2 (1, 1446)	104.9 (59) 22.2- 213.3 (3.7, 283)	144.1 (75.9) 21.5-212.7 (1.0, 1446)
<b>Troponin I (<i>p</i>=.342)</b>	59.3 (21.6) 3.5- 59.6 (.1, 351.2)	24.3 (20.7) 3.1- 50 (.1, 83.9)	40.2 (21.1) 3.7-50 (0.13, 351.2)
<b>Number of AMI (<i>p</i>=.238)</b>	1.4 (1) 1-1 (0, 6)	1.5 (1) 1-2 (0, 6)	1.45 (1) 1-2 (0, 6)
<b>Co-morbidities (<i>p</i>=.071)</b>	2.3 (2) 1-3 (0, 5)	2.8 (3) 2-4 (0, 5)	2.6 (3) 1-4 (0,5)
	<b>Academic Center</b>	<b>Community Hospital</b>	<b>Total</b>
<b>Variable</b>	<b><i>n</i> (%)</b>	<b><i>n</i> (%)</b>	<b><i>N</i> (%)</b>
<b>History of Cardiac Rehabilitation (<i>p</i>=.091)</b>			
Yes	14 (45.2)	11 (26.2)	25 (33.3)
No	17 (54.8)	31 (73.8)	48 (64.0)
<b>Psychiatrist/Counselor/Support Group Attendance (<i>p</i>=.179)</b>			
Yes	3 (9.4)	1 (2.3)	4 (5.3)
No	29 (90.6)	42 (97.7)	71 (94.7)

Descriptive Summaries of the Study Scale Values

The scores obtained from the Learned Helplessness Scale (LHS), Multidimensional Scale of Perceived Social Support (MSPSS), Cardiac Self Efficacy Scale (CSE), and the Beck Depression Inventory Second Edition (BDI-II) are summarized in Table 6.

Total scores on the LHS can range from 20 to 80, with higher scores indicating increased perception of learned helplessness. Scores in this study ranged from 20 to 64 suggesting a skewed sample with a majority of subjects reporting less learned helplessness. MSPSS total scores can range from 12 to 84, with higher scores indicating a higher level of perceived social support. Scores in this study ranged from 19 to 84 again suggesting that subjects identified a wide range of perceived social support with no subjects having very low perceived social support. Total scores on the CSE can range from 0 to 8, with higher scores indicating an increased perception of cardiac self-efficacy. Scores in this study ranged from 0.8 to 8 suggesting a relatively full range of self-reported self-efficacy. Scores on the BDI-II can range from 0 to 63, with higher scores indicating increased depressive symptoms. Scores in this study ranged from 0 to 44. These scores suggest skewed data with a majority reporting low to moderate depressive symptoms.

Table 6. Summary of Instrument Descriptive Statistics

	Mean	Median	Interquartile Range		Minimum	Maximum
			25	75		
<b>Learned Helplessness Scale</b>						
	40.4	42	34	47	20	64
<b>Multidimensional Scale of Perceived Social Support</b>						
<b>Sig Other Subscale</b>	22.9	26	20	28	4	28
<b>Family Subscale</b>	23.7	26	24	28	4	28
<b>Friends Subscale</b>	22.6	24	19	28	8	28
<b>Total</b>	69.2	72	60	83	19	84
<b>Cardiac Self-Efficacy</b>						
<b>Control Subscale</b>	2.8	2.8	2.3	3.5	0.4	4
<b>Function Subscale</b>	2.4	2.6	1.4	3.2	0	4
<b>Total</b>	5.2	5.6	3.6	6.8	0.8	8
<b>Beck Depressive Inventory Second Edition</b>						
	13.5	10	5	20	0	44

The univariate associations among each of the study and clinical variables, as well as those associated with depressive symptoms are summarized in Appendix F.

### Research Aims and Hypotheses

Specific Aim 1: Examine the relationship between learned helplessness and depressive symptoms in subjects who have experienced an AMI.

Hypothesis 1. There will be a direct, positive relationship between learned helplessness and depressive symptoms. A statistically significant direct relationship was found between

scores on the LHS and BDI-II ( $r = 0.77, p < .001$ ). Therefore the hypothesis was supported suggesting that individuals in this study who had higher self-reported levels of learned helplessness also reported more depressive symptoms.

Specific Aim 2: Examine the relationship between clinical and psychosocial factors, learned helplessness, and depressive symptoms.

Associations of the clinical and psychosocial factors measured in this study with self-reported levels of learned helplessness and depressive symptoms are summarized in Table 7.

Hypothesis 2a. Increased number of AMI events and increased number of co-morbidities will have a positive association with learned helplessness and depressive symptoms. No statistically significant associations of the number of AMI events or co-morbidities with the LHS and the BDI-II were observed (see Table 7).

Hypothesis 2b. Increased social support and increased self efficacy will have a negative association with learned helplessness and depressive symptoms. Statistically significant inverse associations of scores on the MSPSS and CSE with self-reported learned helplessness and depressive symptoms were observed (see Table 7). In other words, individuals in this study who reported higher levels of social support and self-efficacy tended to experience less learned helplessness and less depressive symptoms.

Table 7. Associations of Depressive Symptoms and Learned Helplessness with number of previous AMI, Co-morbidities, Perceived Social Support, and Self-Efficacy ( $N = 75$ )

	<b>BDI-II</b>	<b>LHS</b>
<b>AMI</b>	.15 (.203)	.11 (.359)
<b>CoM</b>	-.01 (.950)	.10 (.387)
<b>MSPSS</b>	-.60 ( $<.001$ )	-.49 ( $<.001$ )
<b>CSE</b>	-.66 ( $<.001$ )	-.63 ( $<.001$ )

Note: Values in the cells are  $r$  ( $p$ -value).

BDI-II – Beck Depressive Inventory Second Edition

LHS – Learned Helplessness Scale

AMI – Number of AMI events

CoM – Co-morbidities

MSPSS – Multidimensional Scale of Perceived Social Support

CSE – Cardiac Self Efficacy

### Multivariate Analysis

Before conducting the multivariate analysis, possible co-varying associations of the demographic characteristics with depressive symptoms were assessed. Statistically significant associations with the BDI scores were observed for age ( $r = -.35, p = .002$ ) and yearly household income ( $r = -.41, p < .001$ ). These findings suggested that younger individuals tended to report higher levels of depressive symptoms and individuals with a lower estimated yearly household income tended to report higher levels of depressive symptoms. In addition, a statistically significant association of disability status with depressive symptoms was observed ( $r = .29, p = .012$ ). The interpretation of this association is that subjects who identified themselves as either unemployed or disabled tended to report higher numbers of depressive symptoms than subjects who identified themselves as employed. No other statistically significant demographic co-varying associations were

observed, thus due to the limited sample size in this study, only age, income, and disability status were controlled for in the multivariate analysis.

The statistical findings from the hierarchical multiple linear regression analysis are summarized in Table 8. An initial model that included estimated yearly household income, age, and disability status demonstrates a statistically significant multivariate association with depressive symptoms (Multiple R = 0.57,  $p < .001$ , Adjusted  $R^2 = .30$ ) and accounted for approximately 32.7% of the variability in depressive symptoms.

The addition of the number of previous AMIs and co-morbid factors after controlling for the demographic characteristics accounted for less than a 1% increase in shared variability with depressive symptoms and was not statistically significant ( $p = .772$ ). The addition of social support and self-efficacy values in the next step of the analysis resulted in a statistically significant increase in the shared variability with depressive symptoms (an increase of 25.4%,  $p < .001$ , adjusted  $R^2 = .54$ ). Finally, after controlling for estimated yearly household income, age, disabled status, number of AMIs, co-morbid factors, as well as the social support and self efficacy variables, the addition of learned helplessness contributed a statistically significant increase in the ability to explain the reported number of depressive symptoms in this sample. The shared variability with depressive symptoms increased 13.2% ( $p < .001$ ) with the addition of learned helplessness to the model (Multiple R=.85,  $p < .001$ , adjusted  $R^2 = .68$ ).



Table 8. Hierarchical Regression Analysis of Depressive Symptoms

<b>Model</b>	<b>Beta</b>	<b><i>p</i>-value</b>	<b>R</b>	<b>R<sup>2</sup> Change</b>	<b><i>p</i>-value</b>
<b>Step 1</b>			.57	.33	<.001
<b>Age</b>	-.35	.001			
<b>Disabled Status</b>	.07	.514			
<b>Income</b>	-.43	<.001			
<b>Step 2</b>			.58	.01	.772
<b>Age</b>	-.33	.003			
<b>Disabled Status</b>	.07	.517			
<b>Income</b>	-.44	<.001			
<b>AMI</b>	.00	.676			
<b>Co-morbid factors</b>	-.07	.521			
<b>Step 3</b>			.77	.25	<.001
<b>Age</b>	-.17	.059			
<b>Disabled Status</b>	.03	.773			
<b>Income</b>	-.15	.132			
<b>AMI</b>	.07	.423			
<b>Co-morbid factors</b>	-.06	.523			
<b>MSPSS</b>	-.27	.007			
<b>CSE</b>	-.42	<.001			

Overall model tests: Adjusted R<sup>2</sup>: Step 1: .298, Step 2: .283, Step 3: .543, Step 4: -.684

Table 8. Hierarchical Regression Analysis of Depressive Symptoms (cont.)

<b>Step 4</b>			.85	.13	<.001
<b>Age</b>	-.14	.058			
<b>Disabled Status</b>	.01	.864			
<b>Income</b>	-.09	.267			
<b>AMI</b>	.06	.417			
<b>Co-morbid factors</b>	-.07	.315			
<b>MSPSS</b>	-.17	.043			
<b>CSE</b>	-.20	.037			
<b>LHS</b>	.49	<.001			

Overall model tests: Adjusted R<sup>2</sup>: Step 1: .298, Step 2: .283, Step 3: .543, Step 4: -.684

## CHAPTER V

### DISCUSSION

This chapter presents a discussion of the study results in six principal sections: (a) sample characteristics, (b) hypotheses, (c) regression analyses, (d) study strengths and limitations, (e) recommendations for future research, and (f) conclusions and implications.

#### Sample Characteristics

The characteristics of the sample in this dissertation study were similar to the characteristics of other samples in earlier studies that examined learned helplessness and depression (Agarwal, 1995; Benight, 1996; Byrne, 1980; Cherrington, 2004; Denollet, 1998; Doerfler, 2005; Fowers, 1994; Frasure-Smith, 1991, 1993; Johnson, 1990; Ladwig, 1994; Levy, 1981; Moser, 1995, 1996; Rankin, 2002). Of the 75 subjects in this study, 80% were men, with 90.7% reporting Caucasian as their identifying race. The mean age of subjects was 58.7 years, with a median age of 57. Interquartile range was from 51 years to 67 years of age.

In the year 2000, the state of Tennessee estimated statewide statistics having 48.7% men, and the overall racial/ethnic distribution indicated that 81.9% were Caucasian. Age distribution was 27.9% between the ages of 20 and 34 years, 29.7% between 35 and 54 years, 9.4% between 55 and 64 years, 10.9% between 65 and 84 years, and 1.4% greater than 85 years of age (Tennessee Department of Economic & Community Development, n.d.). Demographics of patients at the academic study site in the year 2008 showed 70.5% men, and the overall racial/ethnic distribution was 88.5% Caucasian, 8.5% African American,

1.5% Hispanic, and 1% other races. The median age represented was 61.5 years, with 20% of patients being greater than 75 years of age.

Gender. A review of the extant literature indicated a difference in gender representation in previous studies examining helplessness in AMI patients. For example, numerous studies used samples consisting exclusively of male participants (Agarwal, 1995; Benight, 1996; Frasure-Smith, 1991; Ladwig, 1994; Levy, 1981; Rankin, 2002). Other studies ranged from having greater than 80% male participants (Denollet, 1998; Fowers, 1994; Frasure-Smith, 1993; Moser, 1995) to having a matched sample by gender (Cherrington, 2004; Johnson, 1990). Male study subjects in this dissertation study accounted for 80% of the total research sample.

Although the gender representation within this dissertation study was similar to that of extant literature, it significantly varies from that of the state of Tennessee as a whole, and from the known presentation of the academic study site. There are a few plausible explanations for the lower representation of females in this dissertation research sample. The American Heart Association (2010) identifies the prevalence of coronary heart disease (CHD) to be greater in men than in women. Men and women between the ages of 20 and 59 have identical incidences of coronary heart disease. However, between the ages of 60 and 79 years, an additional 18.1% of men are diagnosed with CHD, followed by an additional 11.6% of men greater than 80 years of age. This is compared with 9.6% of women between the ages of 60 and 79 years of age and 6.1% of women greater than 80 years of age. With higher incidence of CHD in men, higher occurrences of AMI also occur in men (AHA, 2010). Although heart disease in women has gained tremendous momentum over recent years, the incidence of first time AMI in both Caucasian and African American women is still less than

that of Caucasian and African American men across all ages groups (AHA, 2010). Such statistics support higher percentages of male subjects given the higher incidence of AMI in men.

Additionally, epidemiologic evidence regarding cardiovascular disease support the incidence of AMI and CHD and associated AMI mortality to be greater in men. However, total cardiovascular disease deaths in women surpass that of men (AHA, 2010). The strong relationship between coronary heart disease and overall cardiovascular health provides a plausible explanation to the lower number of women subjects. With cardiovascular health being attributed to coronary artery disease, stroke, heart failure, and high blood pressure, mortality of women following an AMI can produce a smaller population of women having follow up visits in the clinic setting (AHA, 2010).

Age. From previous research, mean ages of study subjects ranged from 50 to 59 years of age (Agarwal, 1995; Byrne, 1980; Denollet, 1998; Doerfler, 2005; Frasure-Smith, 1991, 1993; Johnson, 1990; Ladwig, 1994; Moser, 1996), or from 60 to 67 years of age (Benight, 1996; Cherrington, 2004; Fowers, 1994; Levy, 1981; Moser, 1995; Rankin, 2002). With the mean age of subjects in this study being 58.7 years, and the interquartile range being from 51 years to 67 years of age, the age representation in this research sample was consistent with those reported in earlier studies. The mean age of the subjects in this dissertation study also fell within the range identified by the AHA as having the most significant number of newly diagnosed AMI for both men and women across their life span. These data also are consistent with epidemiologic data published by the American Heart Association including that 24.4% of men and 15.9% of women between the ages of 40 and 79 years of age have a diagnosis of CHD (2008).

Ethnicity. Ethnic representation in previous research samples was not thoroughly described. Rankin (2002) reported 81% of participants to be Caucasian, while Cherrington (2004) reported all subjects identifying themselves as Caucasian. The state of Tennessee estimated statewide statistics having an overall racial/ethnic distribution of 81.9% Caucasian (Tennessee Department of Economic & Community Development, n.d.). Demographics from the academic study site, one year prior to data collection for this dissertation research, reported 88.5% of its patients to be Caucasian. In this dissertation study, 68% of subjects identified themselves as Caucasian. Ethnic representation can vary based on geographic location and the type of institution at which data collection took place.

In evaluating the ethnic representation in this research sample, both study sites are known within the Middle Tennessee region for providing high quality cardiovascular care. Both sites have 24-hour heart catheterization labs and access to air transport for emergent care of patients who have had an AMI. Given their reputations and ease of access, these facilities could potentially attract a higher minority population than state or national demographics would anticipate. The distribution of enrolled number of Caucasian and African American subjects at either study site was not statistically different, and therefore, is believed to be representative of the publicized clinic population data for both sites.

### Discussion of Hypotheses

Two of the three research hypotheses were supported in the initial correlation analysis. Each hypothesis is discussed below.

Hypothesis 1. As predicted, a direct, positive relationship existed between learned helplessness and depressive symptoms. This result suggests that subjects in this study who

had higher levels of learned helplessness also experienced higher levels of depressive symptoms.

A review of the existing empirical and theoretical literature supports that learned helplessness is associated with depressive symptoms in patients with medical conditions, such as chronic pain (Burns, Kubilus, Bruehl, Harden, & Lofland, 2003), epilepsy (Endermann, 1997), and rheumatoid arthritis (Nicassio, Wallston, Callahan, Herbert, & Pincus, 1985), and in patients with nonspecific disorders requiring both inpatient and outpatient services (Raps, 1982). Additionally, learned helplessness has been shown to mediate a variety of outcomes, such as depressive mood, self-reported pain behavior, and fatigue severity, in patients with rheumatoid arthritis (Smith, Christensen, Peck, & Ward, 1994; Smith, Peck, Ward, 1990), multiple sclerosis (van der Werf, Evers, Jonger, & Bleijenberg, 2003), and fibromyalgia (Nicassio, Schuman, Radojevic, & Weisman, 1999).

In studies of learned helplessness in post-AMI patients, positive correlations have been shown to exist between the psychosocial factors of anxiety, perceived control, hostility and anger, emotional distress, quality of life, fatigue, and self-reported pain (Agarwal, 1995; Cherrington, 2004; Condon, 2006; Jensen, 2003; Johansson, 2003; Johnson, 1990; Levy, 1981; Moser, 1995, 1996, 2002; Riegel, 1998; Siegrist, 1987).

Acute illnesses, such as AMI, are initially treated with the technologic advances in health-care with a desired outcome of resuming the individual's previous quality of life. These acute illnesses, however, can leave an individual with a condition not curable by surgery or other short-term medical means. In this way, the individual has transitioned from the acute phase of an illness to the chronic phase of an illness (Murrow & Oglesby, 1996). As discussed above, learned helplessness has an established association with depressive

symptoms in some populations with chronic illnesses. Following an AMI, the emerging chronic illness is that of coronary heart disease. Such a diagnosis requires ongoing care and attention by the individual to assure optimal recovery and self-management. Additionally, other known psychosocial factors (e.g., social support & self efficacy) correlated with learned helplessness in post-AMI patients have been shown to also be associated with depressive symptoms. In doing so, findings of this dissertation research support the existing evidence between learned helplessness and depressive symptoms, while providing a unique perspective in individuals following an AMI.

Hypothesis 2a. An increase in the number of AMI events and increased number of co-morbidities were predicted to have a positive association with helplessness and depressive symptoms. The hypothesis was not supported. The number of AMI events did not correlate with increased helplessness or increased depressive symptoms. The number of co-morbidities also did not correlate with an increased degree of learned helplessness or increased depressive symptoms.

The incidence of clinically significant depression in patients with AMI is reported to occupy a broad range from 15- 65% (Billings, Kearns, & Levene, 1981; Fielding, 1991; Frasure-Smith, Lesperance, & Talajic, 1993; Ladwig, Röhl, Breithardt, Budde, & Borggrefe, 1994; Moser & Dracup, 1995; Sirois & Burg, 2003; von Känel & Bégé, 2006). In the general population, however, approximately 10% of individuals experience depressive symptoms. Of this 10%, only 15-30% develop a major depressive disorder (Bush, 2005; Strik, 2001). Thus, variability exists between the general population and individuals who have experienced an AMI. Among subjects in this dissertation research, the number of co-morbidities and the number of previous AMIs did not significantly contribute to learned



helplessness and depressive symptoms. The mean number of previous AMIs was 1.45, with the largest number of subjects ( $n=19$ , 25.3%) having three co-morbidities.

The Learned Helplessness Theory explains how multiple failed attempts to influence a situation or desired outcome may result in learned response-outcome independence. In other words, individuals with greater number of previous AMI would be expected to have more depressive symptoms and a stronger correlation between learned helplessness and depressive symptoms. The findings of this dissertation study did not support the theoretical framework in this regard. One plausible explanation is related to the cross sectional nature of the study design. Considering the longitudinal nature of learned helplessness, the particular time point of data collection post-AMI could have had a significant role in the development of perceived helplessness. Data collection was obtained from many subjects during their first follow-up visit, with the median time since AMI being 79 days. Additionally, the median number of previous AMIs reported was 1. These statistics do not allow for the chronic nature of learned helplessness. A more favorable design would be a longitudinal study where subjects could be studied over a period of years, throughout the course of their illness and treatment regimen.

A great deal of research has been conducted regarding co-morbid factors contributing to AMI (AHA, 2008). These include modifiable factors (e.g., tobacco abuse, high blood cholesterol, high blood pressure, obesity, diabetes mellitus) and un-modifiable factors (e.g., increased age, gender, and heredity). The greater number of risk factors and symptom burden occurring in any one particular individual, the greater risk there is for experiencing an AMI and higher cardiovascular mortality and morbidity (Everson-Rose & Lewis, 2005). Higher risk of cardiovascular mortality and morbidity is associated with negative emotional

states, such as depressive symptoms. These emotional states, however, can not necessarily be depicted by the number of co-morbidities carried by an individual (Moser, 1995).

Moser and Dracup (1995) examined cardiovascular disease severity, showing no association with psychosocial factors including anxiety, depressive symptoms, and hostility. These findings were replicated in other subjects having cardiovascular disease (Dracup, Walden, Stevenson, & Brecht, 1992) and rheumatoid arthritis (Creed, 1990; Moser, Clements, Brecht, & Weiner, 1993). It can be conceived that no significant relationship existed between the number of previous AMIs and the number of co-morbid factors with learned helplessness and depressive symptoms as these two characteristics are frequently utilized in determining disease severity.

Hypothesis 2b. As predicted, increased social support and increased self efficacy had negative associations with helplessness and depressive symptoms. These results suggested that subjects in this study who had higher degrees of social support and self efficacy experienced less helplessness and fewer depressive symptoms.

According to Burg (2005), low perceived social support is predictive of health-related outcomes, independent of medical co-morbidities and other related conditions. It has also been found to be a predictor of survival and has been linked with overall mortality in patients after AMI (Burg, 2005).

Low levels of social support in patients who are post-AMI has been shown to be equivalent in determining mortality and morbidity as many of the classic risk factors, such as hypertension, tobacco abuse, and high blood cholesterol levels (Mookadam & Arthur, 2004). Since the publication of epidemiologic evidence in the 1980s, the results of previous research studies consistently demonstrated a direct positive relationship between social support and

health status (Broadhead et al., 1983). Furthermore, the positive association between social support and depressive symptoms in AMI patients is also demonstrated in the literature (Everson-Rose & Lewis, 2005).

Perceived self-efficacy has been shown to play a significant role in numerous aspects of health behavior, including successful recovery from AMI and adherence to preventive health programs (O'Leary, 1983). This sentinel work paved the way for Waltz and Bandura (1988) in their works on self-efficacy. Thus, perceptions of decreased self-efficacy can lead to an erosion of positive attitudes and an increase in the occurrence of depressive disorders (Waltz & Bandura, 1988).

Given these relationships between social support, self efficacy, and depressive symptoms, individuals who do not have an intact social structure or means of receiving encouragement beyond hospital discharge tend to feel they are unable to influence their condition. Johansson (2003) described this relationship by discussing how dependence, feelings of being overwhelmed with discharge instructions and responsibilities, and the lack of an out-of-hospital support system create the perception of helplessness in post-AMI patients. In the same way, individuals with a lower level of cardiac self efficacy believe they are incapable of modifying their cardiac status.

In the absence of sufficient social support and self-efficacy, an individual is more likely to have inadequate resources to assist in lifestyle modification necessary to recovery from an AMI. Multiple failed attempts at lifestyle modification (e.g., weight control & diet) will predispose an individual to the process of learned helplessness.

## Regression Analyses

The multivariate relationships among key study variables and demographic factors were examined using hierarchical multiple linear regression. The results of each analysis are discussed below.

Depressive Symptoms. Regression analyses were done to examine the multivariate relationships of the main study variables, demographic, and clinical factors of interest to depressive symptoms. Learned helplessness, perceived social support, and self efficacy were the primary predictors of depressive symptom scores. Additional demographic and clinical factors also were evaluated for their contribution to variance in depressive symptoms. These factors included estimated yearly household income, age, disabled status, number of previous AMIs, and number of co-morbid risk factors. Subjects who had lower perceptions of social support and self-efficacy and who had increased feelings of learned helplessness had increased depressive symptoms. Demographic factors of age and estimated yearly household income significantly contributed to variance of depressive symptoms ( $\beta = -.331, p = .003$ ;  $\beta = -.435, p < .001$  respectively) in the initial two models that included age, disabled status, estimated yearly household income, number of previous AMIs, and number of co-morbid risk factors. With the addition of social support and self efficacy in model 3, both age and estimated yearly household income failed to achieve statistical significance within the multivariate regression. With the addition of learned helplessness in model 4, social support and self efficacy maintained their significant contribution to variance as did learned helplessness ( $\beta = .493, p < .001$ ).

Learned Helplessness. Within the extant literature, learned helplessness has been shown to mediate a variety of outcomes, such as depressive mood, self-reported pain

behavior, and fatigue severity, in patients with rheumatoid arthritis (Smith, 1990, 1994), multiple sclerosis (van der Werf, 2003), and fibromyalgia (Nicassio, 1999) and to be a cognitive mediator of pain-related outcomes and quality of well being (Nicassio, 1999), emotional instability and neurological impairment (van der Werf, 2003), cognitive distortion (Smith, 1994), and disease severity (Smith, 1990). The results from these studies indicated that helplessness mediated the relationship between the independent and dependent variable, significantly contributing to subjects' experience of fatigue, depressive mood, and self-reported pain behavior.

As seen in this study, learned helplessness was found to have a significant, positive relationship to depressive symptoms. Subjects with higher levels of learned helplessness experienced greater depressive symptoms. Additionally, when evaluated in a hierarchical regression, helplessness significantly contributed to the shared variance in depressive symptoms. These findings are consistent with the extant literature as discussed in a variety of populations involving multiple disease processes other than those experiencing an AMI. Though the majority of previous research studies focused on populations with chronic disease processes, there are similarities with the AMI population. For example, following hospital discharge post-AMI, individuals transition from the acute phase of illness to living with the chronic condition of coronary artery disease (CAD). A large percent of study subjects ( $n=23$ ; 30.7%) in this dissertation research had previously experienced an AMI and were already living with chronic CAD. For the remaining 69.3%, the cardiac event qualifying subjects to be enrolled in this study was their first AMI and the beginning of living with this chronic condition. This transition from acute illness to chronic diagnosis within the

target year since the qualifying AMI and its correlation to depressive symptoms is comparable to the nature of chronic illness represented within the literature.

Social Support. Increased perceived social support has been found to predict overall survival in patients after AMI. Low perceived social support also has been found to correlate with worsened medical outcomes (e.g., prolonged hospitalization, unplanned re-hospitalization) independent of medical co-morbidities (Burg, 2005). When evaluating subjects in this dissertation study, within one year following an AMI, perceived social support continued to negatively correlate with depressive symptoms. Those subjects who felt they had a significant degree of social support had fewer depressive symptoms. These findings are consistent with extant literature regarding social support and depressive symptoms in patients who have had an AMI (Berkman, 2003; Burg, 2005; Frasure-Smith, 2000). Following an AMI, increased psychosocial factors, including social support, decrease post AMI mortality, improve patient outcomes and lessen depressive symptoms.

Cardiac Self-Efficacy. According to Waltz and Bandura (1988), decreased situational self-efficacy leads to an erosion of positive attitudes and an increase in the occurrence of depressive disorders. Self-efficacy also relates to an individual's process of deciding what response he or she will take, how much effort will be put forth, and how much stress will be experienced (Bandura, O'Leary, Taylor, Gauthier, & Gossard, 1987). An individual's level of self-efficacy predicts whether a specific activity will be attempted. In post-AMI subjects, higher levels of self-efficacy reliably predicted more adherence to exercise regimens, dietary recommendations, and functional capacity during cardiac rehabilitation (Gardner, 2003).

As seen in this dissertation study, subjects with increased cardiac self-efficacy had fewer depressive symptoms. As a subject exhibited a greater desire to be involved in

activities post-AMI, a lesser degree of depressive symptoms was experienced. In hierarchical regression analysis, cardiac self-efficacy had a significant negative correlation to depressive symptoms experienced by subjects post-AMI. These findings are consistent with existing evidence indicating that individuals with greater situational self-efficacy experienced fewer depressive symptoms and lower perceptions of learned helplessness.

### Strengths and Limitations

The design and implementation of this study contained both strengths and limitations. In terms of study strengths, data collection occurred at two study sites. This allowed for a more representative sampling of the target population. The disease process of coronary heart disease and the resulting AMI is well understood and heavily delineated in both pathophysiology literature and research literature. This strong literature base allowed for a well-developed foundation for a dissertation study. The occurrence of depressive symptoms in the AMI population has also been evaluated to a moderate extent, creating a gap in the literature surrounding learned helplessness and depressive symptoms in the AMI population. This history of research provided another strong basis for developing this dissertation study. Numerous research studies were available to help guide the hypothesis development and selection of instruments that were used.

While having subjects complete the self-reported questionnaires, numerous individuals had a difficult time comprehending the verbiage used in numerous line items. This caused difficulty as the subjects often asked what the question meant and how they should answer the item. The investigator was unable to answer the questions to avoid any inadvertent bias in the data collection, often leaving the subject confused. When utilizing self-reported questionnaires, there is a risk of subjects not answering truthfully, but rather in

a manner they assume is helpful to the investigator or in a way that may be considered socially acceptable. Additionally, an attempt was made to select questionnaires that were reliable and valid while minimizing the number of items in each scale. Subjects had to complete a total of 64 items and a personal demographic sheet including 10 items. This took the average subject about 30 minutes to complete. Although each subject was willing to participate, this additional time in the clinic could have impacted a subject's responses to the questionnaires.

Throughout data collection, the majority of subjects wanted to share their experience with the principal investigator. It could have been beneficial to use a mixed method design rather than a quantitative design to capture a larger amount of information pertaining to the experiences of the subjects. Given the lack of studies investigating the relationship between learned helplessness and depressive symptoms in the AMI population, qualitative data would further have contributed to existing research and understanding the lived experiences of this patient population.

Finally, utilizing a cross-sectional descriptive model has its own inherent weaknesses. Though numerous variables can be evaluated, the chance of error is significantly greater. This risk can potentially decrease the internal consistency of the study. Additionally, utilizing a cross-sectional design impairs the ability to establish a cause and effect relationship between study variables.

#### Recommendations for Future Research

In future studies, sample sizes greater than 75 subjects could be beneficial. Though statistical significance was found in the majority of analysis performed on the data set, a greater number of analyses and control of cofactors could be performed with a larger data set.



The sample was acquired from two major heart institutes in the Middle Tennessee area. Both facilities were major referral centers to rural Tennessee communities and essentially have identical populations. It would be beneficial to extend such studies beyond this geographic region to include other parts of the United States. This would provide an additional component of not only psychosocial impact on AMI patients but also geographical trends.

This dissertation research utilized a cross sectional correlational design of subjects within their first year of an AMI. Though the majority of deaths post-AMI occur within the first year of the event, a longitudinal view evaluating patients' psychosocial factors and learned helplessness would produce an added dimension to the understanding of depressive symptoms post-AMI. By having a greater understanding of learned helplessness and depressive symptoms, a timeline for intervention may be identified to help improve depressive symptoms, and ultimately patient survival.

Finally, given the lack of heterogeneity in this dissertation study, attempts to recruit a more representative sample should be made in future research. This could be achieved either through multiple methods, such as purposeful sampling, stratified sampling, or matched random sampling.

### Conclusion and Implications

This dissertation study focused on factors impacting depressive symptoms in patients after they had an acute myocardial infarction. Although the concept of depressive symptoms in patients after an AMI has been thoroughly evaluated over the years, the contribution of learned helplessness to depressive symptoms has not been evaluated in this population. This study evaluated this relationship while also examining the impact of social support, self-

efficacy, number of previous AMIs and number of co-morbid factors, and their relationship to helplessness and depressive symptoms within the first year after an AMI.

Using a convenience sample of adults within one year of an AMI in two major cardiac facilities ( $N= 75$ ), relationships among social support, self-efficacy, number of previous AMIs, number of co-morbid factors, and depressive symptoms were examined using descriptive statistics, Pearson product moment correlations, multiple linear regression, and hierarchical linear regression analyses. The results of these analyses support learned helplessness having a positive relationship with depressive symptoms. Social support and self-efficacy were found to have an inverse relationship with learned helplessness and depressive symptoms. No relationship, however, was found between the number of previous AMIs and the number of co-morbid factors, with learned helplessness and depressive symptoms. In addition, it was found that social support, self-efficacy, and learned helplessness each contributed significant shared variance to depressive symptoms, while co-morbid factors and number of previous AMIs did not contribute significant variance to depressive symptoms.

These findings have important implications to the recovery and potential mortality of patients who have had an AMI. In evaluating psychosocial factors related to depressive symptoms, a major predictor of mortality, a greater understanding of contributing concepts can be developed. Additionally, these findings help to delineate contributing factors to psychosocial outcomes known in the medical literature. In developing post-AMI treatment plans, healthcare staff need to expand their focus beyond the physiologic and identify psychological points of intervention.

The implications of this research to the discipline of nursing are through a nurse's ability to optimize health. Nurses are often the primary contact for patients during their hospital stay and when receiving follow-up care for an AMI. Given that the effectiveness of nursing interventions in modifying negative reactions to situational stressors has been well documented in the literature, a relationship between helplessness and depressive symptoms would provide an additional point of intervention. These interventions are more effective when the nurse individualizes a plan of care based on an individual's human experiences, relationships, environmental interactions, and human responses to previous situations that may be viewed as comparable. Nurses may be the first to recognize symptoms of psychosocial distress and, therefore, could mitigate its progression and the ensuing psychological distress.

**Instructions to the Participant:**

In the following instrument there are statements that you are asked to read carefully. After reading each item, respond as to how closely you agree or disagree with how each item describes you and your feelings about yourself. Place an X in the response box which most closely describes your agreement or disagreement for each item.

ITEM	RESPONSE			
	Strongly Agree	Agree	Disagree	Strongly Disagree
1. No matter how much energy I put into a task, I feel I have no control over the outcome.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I feel that my own inability to solve problems is the cause of my failures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I cannot find solutions to difficult problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I don't place myself in situations in which I cannot.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. If I complete a task successfully, it is probably because I became lucky.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I do not have the ability to solve most of life's problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. When I do not succeed at a task I do not attempt any similar tasks because I feel that I will fail them also	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. When something doesn't turn out the way I planned, I know it is because I didn't have the ability to start with.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Other people have more control over their success and/or failure than I do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I do not try a new task if I have failed similar tasks in the past.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. When I perform poorly it is because I don't have the ability to perform better.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I do not accept a task that I do not think I will succeed in.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I feel that I have little control over the outcomes of my work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I am unsuccessful at most tasks I try.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I feel that anyone else could do better than me in most tasks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I am unable to reach my goals in life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. When I don't succeed at a task, I find myself blaming my own stupidity for my failure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. No matter how hard I try, things never seem to work out the way I want them to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I feel that my success reflects chance, not my ability.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. My behavior does not seem to influence the success of a work group.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Appendix B

ID: \_\_\_\_\_

### **Multidimensional Scale of Perceived Social Support** (Zimet, Dahlem, Zimet & Farley, 1988)

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Circle the "1" if you **Very Strongly Disagree**

Circle the "2" if you **Strongly Disagree**

Circle the "3" if you **Mildly Disagree**

Circle the "4" if you are **Neutral**

Circle the "5" if you **Mildly Agree**

Circle the "6" if you **Strongly Agree**

Circle the "7" if you **Very Strongly Agree**

1. There is a special person who is around when I am in need.	1	2	3	4	5	6	7	SO
2. There is a special person with whom I can share my joys and sorrows	1	2	3	4	5	6	7	SO
3. My family really tries to help me.	1	2	3	4	5	6	7	Fam
4. I get the emotional help and support I need from my family.	1	2	3	4	5	6	7	Fam
5. I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7	SO
6. My friends really try to help me.	1	2	3	4	5	6	7	Fri
7. I can count on my friends when things go wrong.	1	2	3	4	5	6	7	Fri
8. I can talk about my problems with my family.	1	2	3	4	5	6	7	Fam
9. I have friends with whom I can share my joys and sorrows	1	2	3	4	5	6	7	Fri
10. There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7	SO
11. My family is willing to help me make decisions.	1	2	3	4	5	6	7	Fam
12. I can talk about my problems with my friends.	1	2	3	4	5	6	7	Fri

Cardiac Self-Efficacy Scale

How confident are you that you know or can:

0 = Not at all confident

1 = Somewhat confident

2 = Moderately confident

3 = Very confident

4 = Completely confident

Control your chest pain by changing your activity levels	0	1	2	3	4
Control your breathlessness by changing your activity levels	0	1	2	3	4
Control your chest pain by taking your medications	0	1	2	3	4
Control your breathlessness by taking your medications	0	1	2	3	4
When you should call or visit your doctor about your heart disease	0	1	2	3	4
How to make your doctor understand your concerns about your heart	0	1	2	3	4
How to take your cardiac medications	0	1	2	3	4
How much physical activity is good for you	0	1	2	3	4
Maintain your usual social activities	0	1	2	3	4
Maintain your usual activities at home with your family	0	1	2	3	4
Maintain your usual activities at work	0	1	2	3	4
Maintain your sexual relationship with your spouse	0	1	2	3	4
Get ritual aerobic exercise(work up a sweat and increase your heart rate)	0	1	2	3	4

## Appendix D

### Demographic Information Questionnaire

ID: \_\_\_\_\_

Birth Date: \_\_\_\_\_

Gender: \_\_\_\_\_

Race :  Black or African American

American Indian or Alaska Native

White

Asian

Native Hawaiian/ Other Pacific Islander Other \_\_\_\_\_

Ethnicity:  Hispanic/Latino

Non-hispanic/non-latino

Highest Grade Completed:  No schooling

1<sup>st</sup>-6<sup>th</sup> grade

7<sup>th</sup>-8<sup>th</sup> grade

9<sup>th</sup>-12<sup>th</sup> grade

Some college

Associates Degree

Bachelors Degree

Masters Degree

Doctoral Degree

Professional/Technical training

Employment status:  Employed

Unemployed

Disabled

Relationship Status:  Single

Married

Domestic Partner

Divorced

Widowed

Estimated Yearly Household Income:

0-\$20,000

\$21,000-\$40,000

\$41,000-\$60,000

\$61,000-\$80,000

\$81,000-\$100,000

\$101,000-\$120,000

\$121,000-\$140,000

\$141,000 or more

Have you attended cardiac rehabilitation: Yes \_\_\_\_\_

No \_\_\_\_\_

Have you seen a counselor/psychiatrist or attended a support group since your heart attack:

Yes \_\_\_\_\_ No \_\_\_\_\_

**Appendix E**  
**Correlation Analysis Among Study Variables**

	<b>BDI</b>	<b>LHS</b>	<b>AMI</b>	<b>CoM</b>	<b>PSS</b>	<b>CSE</b>
<b>BDI</b>	--					
<b>LHS</b>	.771 (<.001)	--				
<b>AMI</b>	.149 (.203)	.107 (.359)	--			
<b>CoM</b>	-.007 (.950)	.101 (.387)	.228 (.049)	--		
<b>PSS</b>	-.600 (<.001)	-.488 (<.001)	-.137 (.242)	.077 (.511)	--	
<b>CSE</b>	-.663 (<.001)	-.630 (<.001)	-.034 (.773)	-.120 (.307)	.499 (<.001)	--

Note: Values in the cells are *r* (p-value).

BDI – Beck Depressive Inventory Second Edition

LHS – Learned Helplessness Scale

AMI – Number of AMI events

CoM – Co-morbidities

PSS – Perceived Social Support

CSE – Cardiac Self Efficacy



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