

The Assessment of Depression and Anxiety Following Myocardial Infarction

By

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Abstract

Each year in the United States, approximately 1.1 million persons experience an acute myocardial infarction. Sixty-five percent of these patients report experiencing symptoms of depression with major depression being present in 15 to 22% of patients. Persons who are depressed and/or anxious following myocardial infarction have a 3.5 times greater risk of death than patients who are not depressed and have cardiovascular disease. **OBJECTIVES:** To determine what effect weekly telephone follow-up phone calls have on levels of depression and anxiety post myocardial infarction. **METHODS:** Twenty seven male and female patients post-myocardial infarction patients were recruited and follow-up data were collected at 6 weeks post-discharge. Measures included the Beck Depression Inventory and the State Trait Anxiety Inventory. In addition, study participants assigned to the intervention group received once weekly phone calls for 6 weeks. **RESULTS:** There was no significant difference between the two groups in levels of depression over time. There was, however, a significant decrease in levels of depression in both groups over time. Levels of state anxiety remained the same in both groups over time. There was a significant difference between the groups in terms of trait anxiety, with the control group showing consistently higher levels of trait anxiety than the intervention group at both time points. **CONCLUSION:** Findings from this study provide valuable information about depression and anxiety symptoms following MI. Recognition of anxiety and depression in this patient population is important and can be expanded upon. Further research should be done to test the feasibility and effectiveness of nurse-initiated telephone follow-up after hospital discharge for acute myocardial infarction in reducing patient depression and anxiety.

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Chapter 1. Introduction

Each year in the United States, approximately 1.1 million persons experience an acute myocardial infarction (U.S. Department of Health and Human Services, 2000). Sixty-five percent of these patients report experiencing symptoms of depression with major depression being present in 15 to 22% of patients. Persons who are depressed have a 3.5 times greater risk of death than patients who are not depressed (Guck, Michael, Elsasser, & Barone, 2001).

Although anxiety is a natural response to the threats associated with an acute myocardial infarction (AMI), up to 26% of patients experience intense anxiety after AMI. Intense anxiety and other negative emotional states such as depression can have detrimental physiological effects.

A variety of factors contribute to morbidity and mortality after acute myocardial infarction. Advanced age at the time of infarction, co-morbid conditions, and left ventricular dysfunction are traditional physical risk factors. In addition, psychological factors may contribute to morbidity and mortality. Psychological co-morbidity is a common presenting feature in patients following acute myocardial infarction. Though depression and anxiety have been associated with the manifestation of heart disease and linked with mortality and morbidity, more recent findings established depression following myocardial infarction to be a significant independent contributor to morbidity and reduced quality of life. Elevated levels of anxiety following AMI have also been found to be a significant predictor of mortality (Martin & Thompson, 2000). Although some degree of anxiety and depression may be expected in all patients with AMI, these

symptoms can be debilitating in many patients (Kim, Moser, Garvin, Riegel, Doering, Jadack, et al., 2000).

Symptoms of depression and anxiety following myocardial infarction have been observed to persist in the months subsequent to the AMI (Lane, Carroll, Ring, Beevers, & Lip, 2000). Approximately 1 in 6 patients with AMI experience major depression and at least twice as many have significant symptoms of depression soon after the event. More than 3 out of 4 individuals who are found to have depression in the hospital soon after AMI are still depressed 3 months later (Ziegelstein, 2001).

Evidence links depression with coronary artery disease and hypertension, and there is a demonstrated link between anxiety disorders and coronary heart disease (Davies, Jackson, Potokar, & Nutt, 2004). Depression is associated with a three to four fold increase in cardiac mortality and is strongly predictive of poor symptomatic, psychological, social, and functional outcome at three and twelve months. Anxiety while in the coronary care unit is associated with an increased risk of acute coronary syndrome and arrhythmic events over the following 12 months (British Heart Foundation Guidelines, 2002).

Stress does not always indicate a risk factor for depression; however, it may be a contributing factor. Post-AMI depression may result from the actual distress and anxiety regarding the event, life stressors, low education level, or social isolation (Thornto, 2001). Patients with low education might be at an increased risk for post-AMI depression because they have fewer job opportunities and flexibility to keep appointments, which could lead to financial strain. These patients experience a

continuous cycle with the onset of post-AMI depression and anxiety leading to more cardiac events, fewer resources, and a progressive depressive state (Thornto, 2001).

Depression is a risk factor for noncompliance in many medical conditions. A recent meta-analysis indicates that patients with depression are 3 times more likely to be non-compliant with medical treatment regimens than patients without depression (DiMatteo, Lepper, & Croghan, 2000). Several psychological factors, including depression, have been associated with poor compliance with advice to adopt an exercise program in patients recovering from an acute coronary event (Guiry, Conroy, & Hickey, et al., 1987). Other studies have shown that patients with depression have a greater dropout rate from cardiac rehabilitation programs and demonstrate poor adherence to prescribed aspirin therapy for secondary prevention in the treatment of coronary artery disease (Ziegelstein, 2001).

In addition to this effect of post-MI depressive behavior, there may be an effect of depression on biological factors that make the patient more susceptible to cardiac arrhythmia or myocardial ischemia. Although the mechanism responsible for this association has not yet been defined, depression is clearly associated with poor compliance with risk-reducing recommendations, with abnormalities in autonomic tone making people more susceptible to ventricular arrhythmias, and with increased platelet activation (Ziegelstein, 2001).

There appears to be interplay between emotional state and ventricular irritability after an MI (Ziegelstein, 2001). Low heart rate variability has been established as an independent predictor of increased mortality in patients after AMI. Furthermore, depressed patients with coronary disease were found to have significantly lower heart rate

variability than age and sex-matched patients with coronary disease who were not depressed or anxious (Carney, Freeland, & Stein, 2000).

Individuals with depression have also been found to have evidence of increased platelet activation. If these abnormalities are present in patients with post-MI depression, then depressed patients recovering from an MI may be more susceptible to recurrent myocardial ischemia than those patients without depression (Markovitz, Shuster, Chitwood, et al., 2000).

The importance of anxiety for patients recovering from an AMI is the association between anxiety and the stress response and the consequent effects of the cardiovascular system. Behaviorally induced activation of the autonomic nervous system might predispose to clinical cardiovascular events. An anxious person may experience elevations in blood pressure, heart rate, and catecholamine levels, leading to an increase in myocardial oxygen demand that can result in acute myocardial infarction. Moreover, untreated anxiety could have severe social, financial, and clinical consequences which could impair recovery. For general hospital patients, untreated anxiety may prolong hospitalization and complicate or exacerbate physical signs and symptoms (O'Brien, Moser, Riegel, & Frazier, et al., 2001).

Clearly, depression and anxiety should be considered risk factors for morbidity and mortality in patients with heart disease. Although much is written about an association between psychiatric depression and cardiovascular morbidity and mortality, evaluation and treatment for depression post-myocardial infarction is not a standard component of care (Yates & Gill, 1998). The American Heart Association has emphasized the importance of improving compliance to achieve better clinical outcomes

(Miller, Hill, Kottke, & Ockene, 1997). In her address to the association's 70th Scientific Session, past president Martha Hill, PhD, RN, spoke of the gaps between the potential benefits to health suggested by the results of clinical trials and the actual benefits achieved in practice. Hill emphasized that these gaps could be narrowed by a marriage between the social and behavioral sciences and the biological sciences (Miller, Hill, Kottke, et al., 1997).

The emphasis for most clinicians, particularly in critical care, is to treat physiological manifestations rather than the emotional manifestations of illness. Clinicians often cite the lack of time as the reason for not being attentive to emotional phenomena. Nurse Practitioners need to recognize psychiatric morbidity, in particular, anxiety and depression in patients with coronary heart disease. Associations seem to have a biological basis and left untreated, psychiatric disorders may worsen the prognosis of patients with cardiovascular problems (Davies, Jackson, Potokar, & Nutt, 2004).

It is crucial that Nurse Practitioners learn to recognize and diagnose depression and anxiety in this population. The frequent association of depression and anxiety with other illnesses suggest that every patient should be routinely screened (Thornto, 2001). Because psychological manifestations in AMI patients are often of a chronic nature, Nurse Practitioners need to reassess patients continually to ensure control of these symptoms. Ultimately, patients with AMI depression and anxiety will have a lower morbidity and mortality and a chance for a quality lifestyle with the aggressive treatment and control of depressive symptoms (Thornto, 2001).

Chapter 2. Framework

Traditionally, much of the management of the acute myocardial infarction patient has focused on physiologic factors; however, it is important to consider psychosocial factors that may adversely affect health outcomes in coronary patients. Major depression is characterized by a “dysphoric mood with loss of interest or pleasure in all or almost all usual activities” (Buselli, & Stuart, 1999, p. 60), and by changes in appetite, sleep, and energy level; feelings of low self-esteem; decreased concentration or difficulty making decisions; and increased feelings of hopelessness. To establish this diagnosis, symptoms must affect functioning, occur frequently, and occur over a minimum of 2 weeks. However, subjective symptoms of clinical depression may be manifested as dysphoric mood and affect, withdrawal, absence of motivation, little energy, and feelings of hopelessness that may provide a profile of a clinical syndrome rather than a diagnosis of major depression (Buselli & Stuart, 1999).

Anxiety, which may be defined as “having a troubled feeling or the experience of fear of the future or distress over a perceived threat” has also been implicated as a psychosocial variable related to coronary disease (Buselli & Stuart, 1999, p.62). Frasure-Smith et al. found that anxiety was one of several psychosocial variables that predicted cardiac events occurring the first year after AMI (Frasure-Smith, Lesperance, & Talajic, 1995).

The goal of nursing is to promote adaptation of the patient during both health and illness. Sister Callista Roy’s Adaptation Model views the patient in a holistic manner, as

a biopsychosocial being who is constantly interacting with the environment (as cited in Ross & Cobb, 1990). The human being's goal through this interaction is adaptation.

Roy believes that an individual's adaptation occurs in four different modes. Included are the physiologic mode, the self-concept mode, the role function mode, and the interdependence mode (as cited in Carrieri, Lindsey, & West, 1986). In the physiologic mode, adaptation involves the maintenance of physical integrity. Basic human needs such as nutrition, oxygen, fluids, and temperature regulation are identified in this mode (as cited in Ross & Cobb, 1990). When one experiences an AMI, the initial goal is to achieve physical stability.

A function of the self-concept mode is the need for maintenance of psychic integrity. Perception of one's physical and personal self are included in this mode. Once physical stability is achieved, the patient may be ready to contend with the triggering event. In the self-concept mode, one focuses on the psychological and spiritual aspects of the individual. An individual post-AMI must adapt to the "new self" who is now living with heart disease and who must now face life style changes and behavior modifications.

According to Roy, the need for social integrity is emphasized in the role function mode. When human beings adapt to various role changes that occur throughout a lifetime, they are adapting in this mode. Suffering an AMI may require a patient to respond to adaptation in the role function mode. He or she must face the fact of a new permanent role; that of the individual living with heart disease.

The need for social integrity is also emphasized in the interdependence mode. Interdependence involves maintaining a balance between interdependence and dependence in one's relationships with others (as cited in Ross & Cobb, 1990). Often

person's who are experiencing illness also experience an increased need for love, respect, and affirmation. The relationships in this mode are a person's close relationships with friends and family. A Nurse Practitioner can also help to meet the patient's and their families need for care, attention, affirmation, and understanding.

A disruption in one adaptive mode often affects the other modes as well. The patient who suffers an acute myocardial infarction must face lifestyle and behavior changes that affect all four modes. Nurse Practitioners need to promote adaptation within these modes, and therefore improve quality of life.

Chapter 3. Review of the Literature

Depression

During the past two decades, a substantial body of evidence has established a link between depression, cardiovascular disease, and mortality. Research has shown that even minimal symptoms of depression increase mortality risk after myocardial infarction. Psychosocial factors, particularly depression and lack of social support, are important predictors of morbidity and mortality in patients with coronary heart disease (Bush, Ziegelstein, & Tayback, 2001). An article published in *The Journal of the American Medical Association* states that major depression in patients hospitalized following a myocardial infarction is an independent risk factor for mortality at 6 months. Others found that the impact of depression is at least equivalent to that of left ventricular dysfunction and history of previous myocardial infarction (Frasure-Smith, Lesperance, & Talajic, 1993).

Canadian Medical Association researchers reported that there is a high prevalence of depressive symptoms among patients after acute myocardial infarction, ranging from 15 to 32%. Depression has also been found in some studies to be an independent predictor of increased mortality after AMI, with the association between depression and mortality being as strong as that between mortality and important clinical predictors such as Killip class, ejection fraction or peak creatinine kinase (Lauson, Beck, Huynh, Dion, Racine & Carignan, et al., 2003). Professor Roy Ziegelstein states that depression is at least as potent a risk factor for post myocardial infarction as other “traditional” predictors of poor outcome. He states that the relative mortality risk of depression is similar to the

relative risk of long-standing diabetes mellitus, left ventricular failure, advanced age, frequent ventricular arrhythmias, and an inability to perform an exercise stress test (Ziegelstein, 2001).

After a life-threatening illness, most patients will have symptoms of depression to which they rapidly adjust. However, after an acute myocardial infarction, a considerable proportion of patients have a persistent emotional disability. Persistent depression in post-myocardial infarction patients has been correlated with a substantially increased mortality risk (Ladwig, Roll, Breithardt, et al., 1994). In a prospective, non-randomized cohort, Ladwig et al. examined 552 male myocardial infarction patients 17-21 days after the acute event, with a follow-up investigation of these patients after 6 months. Patients were allocated at the baseline investigation into groups with low, moderate or severe degrees of depression. The investigation revealed that persistent post-infarction depression is an independent and important source of subsequent morbidity and reduced quality of life. The investigators also concluded that depression has an adverse effect on illness behavior and pain perception (Ladwig, Roll, Breithardt, et al., 1994).

Frasure-Smith et al. followed a cohort of post-AMI patients in Montreal, Quebec, Canada for 18 months. They found an increase in cardiac mortality at both 6 and 18 months among those with major early post-AMI depression. The impact of depression was noted to be equivalent to that of left ventricular dysfunction or a history of myocardial infarction. As a result of this study, the Canadian Cardiovascular Society recommended that all AMI patients be screened for depression using the Beck Depression Inventory (Frasure-Smith, Lesperance, & Juneau, 1999). This same group of researchers also evaluated 896 men and women with a depression inventory after AMI in

the hospital. Mild to moderate depression scores were present in 290 patients. At the 1 year follow-up, depression was a significant predictor of mortality in both men and women (Frasure-Smith, Lesperance, & Juneau, 1999).

Although it is not completely clear whether depression predisposes or causes the processes leading to cardiac events, a number of possible relationships have been described. A study of 222 patients examined the impact of depression over 18 months. The study participants responded to a modified version of the National Institute of Mental Health Diagnostic Interview Schedule (DIS) for a major depressive episode at approximately 7 days after their myocardial infarction. The Beck Depression Inventory (BDI) was also completed by 218 of the patients. All patients were contacted at 18 months to determine survival status. Thirty-five patients met the modified DIS criteria for major in-hospital depression after AMI. Sixty-eight had BDI scores of ≥ 10 , indicative of mild to moderate symptoms of depression. There were 21 deaths during the follow-up period, including 19 from cardiac causes. Seven of these deaths occurred among patients who met DIS criteria for depression, and 12 deaths occurred among patients with elevated BDI scores. The researchers concluded that depression while in the hospital after an acute myocardial infarction is a significant predictor of 18 month post-AMI cardiac mortality. They went on to say that depression also significantly improves a risk stratification model based on traditional post-AMI risks, including previous MI, Killip class, and premature ventricular contractions (Frasure-Smith, Lesperance, & Talajic, 1995).

Ziegelstein et al. demonstrated that compliance with medication and change in lifestyle habits are markedly reduced in patients with depression. When interviewed 4

months after discharge from a hospitalization for AMI, patients with baseline depression reported that they followed recommendations to reduce cardiac risk less often than patients who were not depressed. Compared with those with a BDI score of less than 10, patients with a BDI score of 10 or higher soon after MI indicated 4 months later that they were less often following a low fat diet, exercising regularly, or making attempts to reduce their level of stress or increase their social support. Those with major depression during the initial hospitalization reported lower adherence to these recommendations and also reported taking medications as prescribed less often than those without major depression (Ziegelstein, Fauerbach, Stevens, & Romanelli, 2000).

In a study of 245 hospitalized patients with AMI, a 3-month follow-up was undertaken to determine compliance with discharge instructions and lifestyle choices. The use of tobacco was strongly related to depression. Depressed patients had less compliance, more cardiac symptoms, and an increased need for medical services (Taylor, Barber, McIntosh, et al., 1998). Lauson et al. also found that depressed patients with AMI were more likely to undergo cardiac catheterization. These authors' prospectively evaluated 550 patients admitted with AMI, and followed them for 1 year to measure the prevalence and prognostic impact of depressive symptoms after AMI. Study subjects completed the BDI questionnaire during their hospital stay and at 30 days, 6 months, and 1 year later. Of the 550 subjects who completed the BDI at baseline, 191 had a score of 10 or higher, indicating at least mild depression. They found that depressed patients were more likely to undergo cardiac catheterization and percutaneous transluminal coronary angioplasty within 30 days of the first admission to the hospital. At 1 year, death rates were higher for depressed patients at baseline compared with non-depressed patients,

although the difference was not statistically significant. The authors' concluded that depressive symptoms are common after AMI and are associated with a slight increase in the rate of in-hospital readmission because of cardiac complications (Lauson, Beck, Huynh, et al., 2003).

The cost of health care was affected for the patient with depression after AMI at a 11 % higher rate than the costs for treating a similar patient without depression (Frasure-Smith, Lesperance, Gravel, et al., 2000). Jiang et al. documented that patients with depression have longer lengths of stay and a 41% higher cost of in-hospital medical care compared with non-depressed patients. They also observed that re-hospitalization rates were higher in depressed patients with AMI (Jiang, Alexander, Christopher, et al., 2001).

In a recent cross-sectional study of 1024 adults with stable coronary artery disease (CAD), Ruo et al. found a strong association between depressive symptoms and patient-reported health status in those with CAD. This association included symptom burden, physical limitation, quality of life, and overall health. These authors concluded that efforts to improve health status in this group of CAD patients should include assessment and treatment of depressive symptoms (Ruo, Rumsfeld, Hlatky, & Liu, 2003).

The period immediately following discharge from the hospital after an acute myocardial infarction is a stressful and vulnerable time about which little is known. Psychological morbidity is common, with evidence suggesting that approximately one third of patients experience continuing anxiety and depression after AMI (Daly, Elliot, Traub, Salamonson, Davidson, Jackson, et al., 2000). Psychological factors during convalescence after AMI may hamper return to work and resumption of social roles and

responsibilities. There may be a failure to internalize information exacerbated by a healthcare system with inadequate resources and shortened hospital stay.

Clearly, depression following AMI suggests a poor prognosis and may predict subsequent re-infarction, angioplasty, coronary artery bypass grafting, and even death. Patients experiencing post-AMI depression need control of their depressive behavior to reduce cardiac morbidity and mortality. Unfortunately, the diagnosis of depression in primary care is missed in 50% of all cases, and appropriate treatment is instituted in less than 10% of these patients (Thornto, 2001). To confound this problem, AMI depression remains under diagnosed because somatic complaints such as; fatigue, lethargy, insomnia, and loss of appetite, are often attributed to the patient's physical condition, rather than to a complication from their cardiac disease. Nurse Practitioners have the opportunity to intervene to provide these patients with a quality lifestyle and prevent further cardiac complications by diagnosis and initiation of therapy (Thornto, 2001).

Anxiety

Acute cardiac events may provoke a range of negative emotional responses, including acute distress and fear of dying. A study conducted in London examined 184 patients admitted to the hospital with an acute coronary event. Specifically, the study examined the presence and severity of the fear of dying and acute distress in the patient population. Patients were interviewed an average of 1.5-2.5 days after admission. After the initial interview, patients completed the Beck Depression Inventory and the anxiety sub-scale from the Hospital Anxiety and Depression scale, created by Phillip Snaith and Anthony Zigmund. Intense distress and fear of dying was reported by 40 of the patients (21.7%). Moderate fear and distress was reported by 95 patients (51.6%). The

investigators also found that distress and fear of dying predicted greater depression and anxiety 1 week after an acute coronary event, along with elevated levels of depression at 3 months. In conclusion, the authors stated that distress and fear during the initial stages of an acute coronary event may trigger subsequent depression and anxiety, thereby promoting poorer prognosis and greater morbidity with time (Whitehead, Strike, Perkins, Porras, & Steptoe, 2005).

Clearly, psychiatric symptoms in the period after acute myocardial infarction appear to negatively affect cardiac outcomes. Patients with anxiety after AMI have been found to have higher rates of in-hospital complication (ischemia, infarction, and ventricular arrhythmia) and higher rates of recurrent cardiac events after acute hospitalization (Huffman, Smith, Blais, Beiser, Januzzi, & Fricchone, 2006). Unfortunately, studies have confirmed that identification of these symptoms is significantly limited.

Screening for Depression and Anxiety

A prospective study examined the ability of clinicians (medical residents and nurse practitioners) on in-patient cardiac units to recognize patients with clinically significant depression and anxiety as measured by standardized research instruments. Patients within 72 hours of AMI underwent screening with the *Standardized Clinical Instrument for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* module for major depressive disorder (MDD), the Beck Depression Inventory (BDI-II), and the Beck Anxiety Inventory (BAI). Assessments were completed for 74 patients. The first finding of the study was that, in the absence of systematic screening, treating providers in busy inpatient cardiac units significantly under diagnosed and under treated

depression among patients with AMI. In fact, only 1 subject identified with major depressive disorder was started on an antidepressant during hospitalization, and only 1 of the 3 patients identified by providers as depressed received an antidepressant (Huffman, Smith, Blais, et al., 2006).

The second finding was that providers are much more able to recognize anxiety after myocardial infarction. In contrast to the findings for depression, providers' reports of clinically significant anxiety were associated with a prescription of benzodiazepines, with the majority of patients assessed as clinically anxious receiving benzodiazepines at some point during their hospitalization (Huffman, Smith, Blais, et al., 2006).

In conclusion, medical residents and nurse practitioners routinely under recognized and under treated depression among this patient population. Recognition and treatment of anxiety was slightly better (Huffman, Smith, Blais, et al., 2006).

A study published in the *American Journal of Critical Care* assessed 101 patients' anxiety levels during the first 48 hours after admission for AMI. Patients scores on the Spielberger State Anxiety Index were compared with nurses' and physicians' assessments of the patient's anxiety as reported in the medical record. Only 45 patients had anxiety assessments noted in the record. Of those 45, 26 patients were described simply as anxious without any further description of the level of anxiety. Eleven of those 45 patients had behaviors of anxiety recorded, again, without any indication of the level of anxiety. The authors concluded that anxiety was not routinely assessed despite nearly half the patients having moderate to extreme anxiety when asked. In addition, when clinicians assessed anxiety, their assessments did not match the patient's self-ratings of anxiety (O'Brien, Moser, Riegel, & Frazier, et al., 2001).

According to the Clinicians Handbook of Preventive Services, between 5 and 10% of patients in primary care and between 10 and 14% of hospitalized patients meet the criteria for major depression. Although research has shown that up to 50% of depressed persons seen in primary care settings are not screened and diagnosed with this disorder, the United States Preventive Services Task Force does not currently suggest routine screening of primary care patients for depression. They do, however, recommend a “high index of suspicion” for individuals with chronic or co-morbid illnesses such as CAD (US Department of Health and Human Services, 2000).

Providers often feel reluctant to address psychosocial issues with clients. This may be due to time constraints and/or the provider’s limited clinical knowledge or expertise. Attention to emotional issues, however, can ultimately be efficient and cost-effective. For example, time can be conserved by minimizing the number of extensive work-ups for nonspecific complaints, if depression is identified in place of potential physical illness (Valentine, Byers, & Peterson, 2001).

Given the important role that depression and depressive disorders play as risk factors for AMI and for increased post-AMI morbidity and mortality, Nurse Practitioners should give increased attention to the use of depression screening tools or similar evaluation assessments in patients (Malach & Imperato, 2004). Ideally, a depression screening tool should function similarly to a vital sign, providing an easy to assess yet reliable marker of the need to address a patient’s depression.

A variety of screening tools are available for primary care providers to use in the assessment and management of depression. The Beck Depression Inventory for Primary Care (BDI-PC) is an effective tool to screen for depression in outpatients during routine

office visits. One study showed the BDI-PC yielded 98% clinical efficiency, 97% sensitivity, and 99% specificity rates for identifying patients with and without major depressive disorder (Valentine, Byers, & Peterson, 2001). Because of its brevity, relatively high positive predictive value, and ability to inform the clinician on both depression severity and diagnostic criteria, the PRIME-MD Patient Health Questionnaire (PHQ-9) is also a valuable tool (Nease & Malouin, 2003).

In conclusion, the results of a number of studies indicate that depression and anxiety represent both risk factors for AMI and are predictors for poorer outcomes following it. These risk factors play an important role in affecting blood coagulation, endothelial activity, heart rate variability, patient compliance with medication, and adherence to a healthful diet; all of which influence the morbidity and mortality associated with AMI. Because depression and anxiety are often under-diagnosed, especially in the post-AMI patient, it is crucial that Nurse Practitioners learn to recognize and treat these conditions in this patient population.

When associated with AMI, anxiety and depression may increase hospital length of stay, readmission rates, and consequently the cost of medical care. The available evidence suggests that there is an important need and merit to treat anxiety and depression associated with AMI.

Research Purpose

Management of the myocardial infarction patient should extend beyond the physiologic to include psychosocial factors that may adversely affect cardiac health. Reducing symptoms of anxiety and social isolation may decrease the risk of further cardiac morbidity and mortality. Therefore, psychosocial interventions such as social support and anxiety management may be useful in decreasing symptoms of depression and anxiety (Buselli & Stuart, 1999). The purpose of this research is to determine whether or not follow-up phone calls, with a focus on the patient's feelings after myocardial infarction, are effective in decreasing depression and anxiety in this patient population.

Chapter 4. Methodology

Design

Research design is defined as the overall plan for collecting and analyzing data, including specifications for enhancing the internal and external validity of a study (Polit & Hungler, 1991). The research design of a study spells out the basic strategies that researchers adopt to develop evidence that is accurate and interpretable. Quantitative research deals with the objective measurements of subjects, and then often tests those measurements against some level of significance (Taleff, 2001).

The design of this research project was a quantitative, quasi-experimental design. The type of quasi-experimental design utilized was that of the non-equivalent Control Group, pretest-posttest, involving an experimental treatment and two groups of subjects, observed before and after its implementation. For the purpose of this research project, patients who were admitted to the hospital with the diagnosis of myocardial infarction were considered for enrollment. Patients who wished to participate were assigned to one of two comparison groups. A pretest evaluation of depression and anxiety was administered to subjects in both groups. Weekly telephone calls were placed to the subjects assigned to the intervention group. Upon completion of this intervention, subjects in both groups were given a posttest evaluation of depression and anxiety.

Description of the Sample

Study subjects were obtained from Covenant Healthcare in Saginaw, Michigan. Potential subjects were identified based on the admitting diagnosis of myocardial infarction. Male and female patients, ages 25-75 were considered for enrollment. Non-English speaking subjects and those subjects determined to be critically ill (those patients

who require intravenous medications to maintain hemodynamic stability) were excluded from potential enrollment.

Institutional Review Board approved posters [Appendix B] were displayed in the coronary care unit, asking staff to briefly mention the study to prospective subjects by saying: “a graduate Family Nurse Practitioner student, Beth, would like to talk to you about your participation in her study about people who have had heart attacks and their feelings. Can I give Beth your name?” If yes, the staff member notified the researcher of potential study candidates. The researcher then approached the potential subject with a brief prepared script [Appendix H], inquiring about interest in study participation. Opportunity was given for the subject to ask questions and voice concerns. If the subject agreed to proceed with study enrollment, the researcher obtained informed consent [Appendix A]. A copy of the informed consent was given to the study subject, while the original consent remained with the investigator.

Procedure

Each study participant completed the Beck Depression Inventory [Appendix C] and the State Trait Anxiety Inventory [Appendix D]. The Beck Depression Inventory is a 21-item self-report rating inventory measuring attitudes and symptoms of depression, taking approximately 10 minutes to complete. The State Trait Anxiety Inventory is a 40 item questionnaire measuring state and trait anxiety. State anxiety refers to the feelings of fear or worry which most of us experience from time to time. State anxiety may fluctuate over time and can vary in intensity. Trait anxiety refers to the tendency of an individual to respond anxiously to a stressful situation. Trait anxiety denotes relatively

stable individual differences in anxiety proneness. This survey took approximately 20 minutes to complete.

Demographic information was collected [Appendix F] from the patient, prior to the patients discharge from the hospital. All information collected remained confidential and all identifying information was removed. Subjects were identified by their initials and by number only. A data log [Appendix E] was maintained to track enrollment and follow-up. All data obtained throughout the course of the study was coded and entered into a computer file upon completion of the study by all subjects.

The second part of this study took place after hospital discharge. Study participants were assigned on a 1:1 basis to a control or intervention group. The first subject consented was assigned to the control group, the second subject consented was assigned to the intervention group, the third to the control group, and so on, until a sufficient n was obtained. Participants assigned to the control group received the Beck Depression Inventory and the State Trait Anxiety Inventory in the mail 6 weeks following hospital discharge, to be completed and returned to the study investigator. A self-addressed stamped envelope was supplied to each study participant. Upon return of these questionnaires, a coupon for \$10 in free gasoline was mailed to the study participant. The address to which the subject wanted the voucher sent was obtained prior to the patients discharge from the initial hospitalization.

Study participants assigned to the intervention group were contacted via telephone once weekly for 6 weeks. At each telephone visit, a short questionnaire [Appendix G] was administered. The study participants were asked if they had experienced any feelings of anxiety and/or depression. Opportunity was given for the study subject to ask

questions and voice concerns. Information regarding repeat hospitalizations or procedures was gathered at each visit. Each phone call lasted approximately 10 minutes, and included the study participants without any family or friend involvement. At 6 weeks following discharge from the initial hospitalization, these subjects were mailed the Beck Depression Inventory and the State Trait Anxiety Inventory to be completed and returned to the study investigator. A self-addressed stamped envelope was provided to each study subject. Upon return of these questionnaires, a coupon for \$10 in free gasoline was mailed to the study participant. The address to which the subject wanted the voucher sent was obtained prior to the patients discharge from the initial hospitalization.

If throughout the course of this study it was determined by the researcher that a study participant may be in need of further medical or psychological attention, based on phone conversations or the results of administered questionnaires, the study participant's primary cardiologist was to be notified. The primary cardiologist was then to refer the patient to a mental health professional of his or her choice, according to their established practice guidelines. The researcher drew upon 13 years of experience as a Registered Nurse to aid in this determination. Referral back to the attending cardiologist would allow for continuity of care and would open up a larger network of trained professionals to manage the situation. The subject would be informed that a referral was being made to the attending physician for this reason.

Instruments

The Beck Depression Inventory [BDI] was utilized in this study [Appendix C]. This inventory has been used for 35 years to identify and assess depressive symptoms and has been reported to be highly reliable, regardless of the population being studied (Beck,

Steer, & Garbin, 1988). The BDI is a 21-item test presented in multiple choice format which purports to measure presence and degree of depression in adolescents and adults. Each of the inventory items corresponds to a specific category of depressive symptoms and/or attitude. Numerical values of zero, one, two, or three are assigned to each statement to indicate degree of severity. Internal consistency for the BDI ranges from .73 to .92 with a mean of .86. The BDI demonstrates high internal consistency, with alpha coefficients of .86 and .81 for psychiatric and non-psychiatric populations, respectively. The BDI has a split-half reliability co-efficient of .93.

The State Trait Anxiety Inventory [STAI] was used to measure anxiety [Appendix D]. The STAI is a 40-item measure which provides information about a person's level of both state and trait anxiety. The STAI has been used extensively in the assessment of anxiety in patients with myocardial infarction, and in patients with other cardiac conditions. Scores on the STAI have a direct interpretation: high scores on their respective scales mean more trait or state anxiety and low scores mean less (Lane, Carroll, Ring, Beevers, & Lip, 2000). The stability of the STAI scales has been previously assessed on male and female samples of college students for test-retest intervals ranging from 1 hour to 104 days. The magnitude of the reliability coefficients decreased as a function of interval length. For the Trait anxiety scale the coefficients ranged from .65 to .86, whereas the range for the State anxiety scale was .16 to .62. This low level of stability for the State anxiety scale is expected since responses to the items on this scale are thought to reflect the influence of whatever transient situational factors exist at the time of testing (Consulting Psychologists Press, Inc, 2007).

Demographic data was also collected on each study subject. Demographic information was collected at the time of informed consent, and was recorded on the demographic log [Appendix F]. Specific information collected included age, race, sex, marital and employment status, number of children, past medical and surgical history, and current medications.

Data Analysis

Data were collected and entered in the SPSS data base management system by the researcher. Statistical testing was performed in collaboration with Brady West, M.A., B.S., Senior Statistician at the Center for Statistical Consultation and Research. Data were checked for accuracy by visual inspection of the descriptive data.

Descriptive statistics were used to describe the demographic characteristics of the subjects. The demographic variables were analyzed using frequencies and percentages for categorical variables. The research hypothesis was analyzed using means and standard deviations. A t-test was performed to determine if the differences in the groups Beck Depression Inventory (BDI) and State Trait Anxiety Inventory (STAI) scores were statistically significant. The level of significance was set at 0.05.

Profile of the Sample

Thirty eight subjects consented to participate in the study, based on previously specified inclusion/exclusion criteria. Nineteen subjects were assigned to the control group and 19 subjects assigned to the intervention group. One study participant underwent a heart transplant and was unable to complete the study requirements. The phone of one study participant assigned to the intervention group was disconnected; therefore that participant was unable to be reached for any of the 6 week telephone

follow-up calls. Nine study participants; 6 in the control group and 3 in the intervention group, failed to return the inventories mailed to their homes after hospital discharge.

Twenty seven subjects completed the study as outlined by the research protocol. Sixteen subjects remained in the control group, 11 subjects in the intervention group. The subjects ranged in age from 37 years to 75 years. The mean age of subjects was 58.3 years with a median age of 60.0 years and a mode of 68. Males comprised 48% (n=13) of the sample, females 52% (n=14). Participants were primarily married (82%, n=22), Caucasian (92%, n=25), currently employed full-time (n=11) or retired (n=11). Table 1 outlines additional demographic data by control or intervention group.

Table 1
Demographics
(N=27)

Demographic	Control (n=16)		Intervention (n=11)	
	n	%	n	%
Ethnicity				
Caucasian	14	87.5	11	100
African American	2	12.5	0	0
Other	0	0	0	0
Race				
Hispanic	0	0	0	0
Non-Hispanic	16	100	11	100
Marital Status				
Married	13	81.3	7	63.6
Widowed	1	6.2	0	0
Divorced	0	0	2	18.2
Single	2	12.5	2	18.2
Employment Status				
Full Time	6	37.5	5	45.4
Part Time	1	6.3	1	9.1
Retired	7	43.7	4	36.4
Unemployed	2	12.5	1	9.1

Information regarding each subject's past medical history was obtained and recorded on the demographic log. Subject's responses are outlined in Table 2.

Table 2. Past Medical History
(n=number of respondents who answered yes)

Demographic	Control (n=16)		Intervention (n=11)	
	n	%	n	%
Coronary Artery Disease	8	50.0	3	27.3
Diabetes	5	31.3	2	18.2
Stroke	0	0	0	0
Kidney Disease	5	31.3	0	0
Family History Of CAD	10	62.5	8	72.7
Peripheral Vascular Disease	2	12.5	0	0
Cancer	2	12.5	3	27.3
COPD	0	0	0	0

Chapter 5. Results

Analysis of the Data to Answer the Research Hypothesis

Inferential statistics were used to answer the research hypothesis, “Myocardial infarction patients will have decreased levels of depression and anxiety following weekly telephone follow-up calls as measured by the Beck Depression Inventory and State Trait Anxiety Inventory, compared to those with no telephone follow up.” The following steps were used to analyze the BDI and STAI scores:

1. Pre-intervention BDI and STAI mean scores and standard deviations were calculated for the control and intervention groups.
2. Post-intervention BDI and STAI mean scores and standard deviations were calculated for the control and intervention groups.
3. The mean post-intervention BDI and STAI was subtracted from the mean pre-intervention BDI and STAI scores for the control and intervention group and standard deviations were obtained for each score.
4. Repeated measures of Analysis of Variance were computed for both the BDI and the STAI to determine statistical significance of the results at Time 2.

Based on the description of the results of the analysis, the pre-intervention mean BDI score for the control group at Time 1 was 12.68 with a Standard Deviation of 8.48. The pre-intervention mean BDI score for the intervention group at Time 1 was 8.36 with a Standard Deviation of 10.15. The standard error mean for the control group was 2.12, and 3.06 for the intervention group. Tables 3 and 4 represent independent sample test results for the total BDI score at Time 1 for the control and intervention groups.

Table 3. Levene's test for Equality of Variances

Total BDI-II Score at Time 1		F	Sig.
	Equal variances assumed	.067	.798
	Equal variances not assumed		

Table 4. t-test for Equality of Means

Total BDI-II Score at Time 1		t	df	Sig.(2 tailed)	Mean Difference
	Equal variances assumed	1.199	25	.242	4.31136
	Equal variances not assumed	1.158	18.980	.261	4.31136

Inferential statistical testing of the STAI was performed. The State anxiety score as measured at Time 1 within the Control group revealed a mean of 43.81 with a standard deviation of 9.55, and a standard error mean of 2.39. The State anxiety score as measured at Time 1 for the Intervention group revealed a mean of 37.18 with a standard deviation of 15.22, and a standard error mean of 4.59. Trait anxiety within the Control group revealed a mean of 42.69 with a standard deviation of 10.04 and a standard error mean of 2.51. Trait anxiety within the Intervention group revealed a mean of 33.09, a standard deviation of 9.01 and a standard error of mean as 2.72.

Tables 5 and 6 outline the results of the independent samples t-tests of the STAI at Time 1. State anxiety scores could not be reported as results indicated a violation of the assumption of equal variances.

Table 5. Levene's test for Equality of Variances

		F	Sig.
State Anxiety Score Time 1	Equal variances assumed	2.038	.166
	Equal variances not assumed		
Trait Anxiety Score Time 1	Equal variances assumed	1.000	.327
	Equal variances not assumed		

Table 6. t-test for Equality of Means

		t	df	Sig. (2- tailed)	Mean Difference
State Anxiety Score Time1	Equal Variances assumed	1.394	25	.176	6.63068
	Equal variances not assumed	1.282	15.393	.219	6.63068
Trait Anxiety Score Time 1	Equal Variances assumed	2.541	25	.018	9.59659
	Equal variances not assumed	2.595	23.138	.016	9.59659

Data from Time 2 was collected and entered into the SPSS data management base as previously described. Based on the description of the results of the analysis, the post-intervention mean BDI score for the control group at Time 2 was 9.90 with a Standard Deviation of 7.49. The post-intervention mean BDI score for the intervention group at

Time 2 was 6.36 with a Standard Deviation of 8.86. The standard error mean for the control group was 1.87 and 2.67 for the intervention group. Tables 7 and 8 represent independent sample test results for the total BDI score at Time 2 for the control and intervention groups.

Table 7. Levene's test for Equality of Variances

Total BDI-II Score at Time 2		F	Sig.
	Equal variances assumed	.128	.723
	Equal variances not assumed		

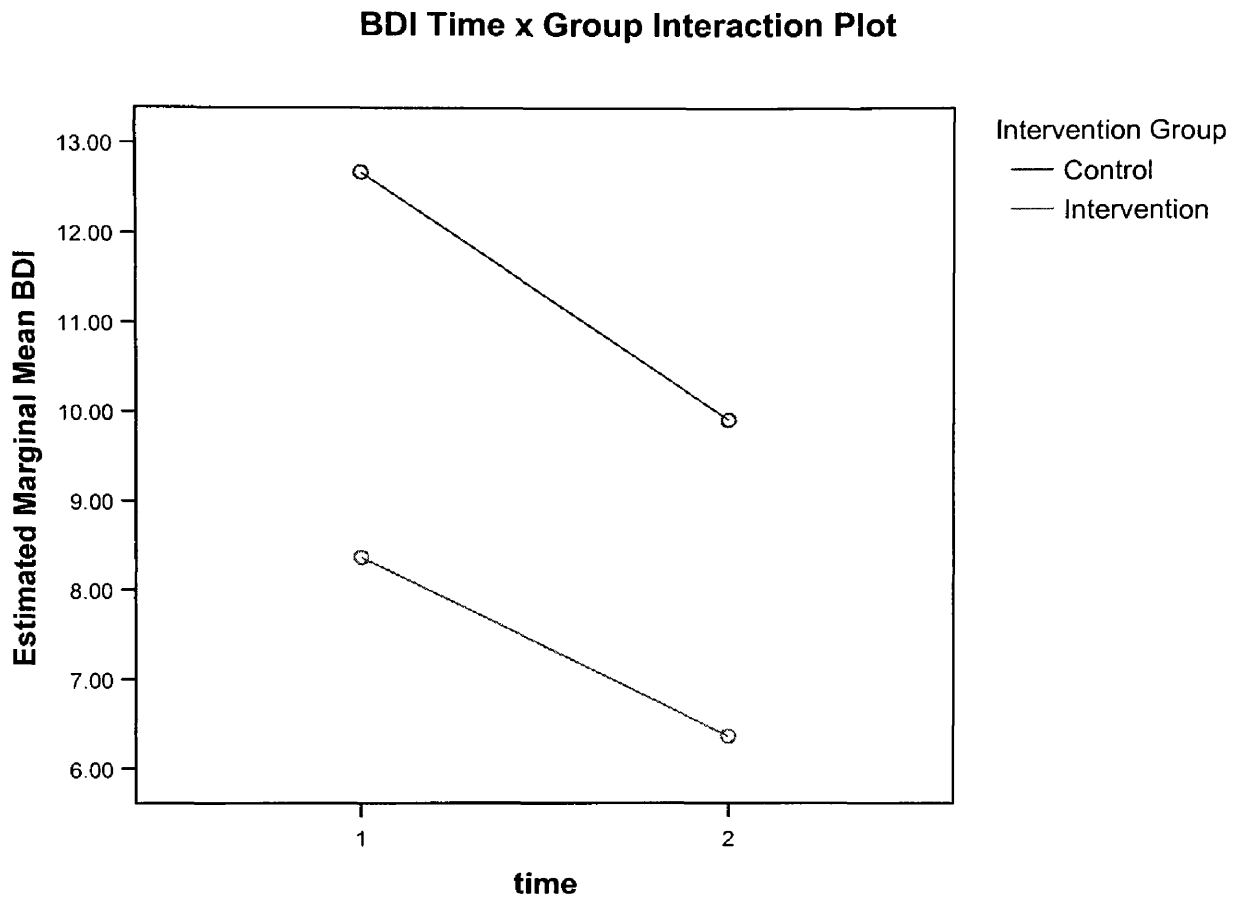
Table 8. t-test for Equality of Means

Total BDI-II Score at Time 1		t	df	Sig.(2 tailed)	Mean Difference
	Equal variances assumed	1.121	25	.273	3.53949
	Equal variances not assumed	1.085	19.159	.291	3.53949

There was a significant overall effect of Time ($F(1,25) = 6.327, p = 0.019$), with the Time 2 mean being lower on average by approximately 2.4 across groups. There was no significant interaction of group with time, suggesting that each group had the same trend over time. There was also no significant difference between the groups overall.

Figure 1 represents these findings.

Figure 1.

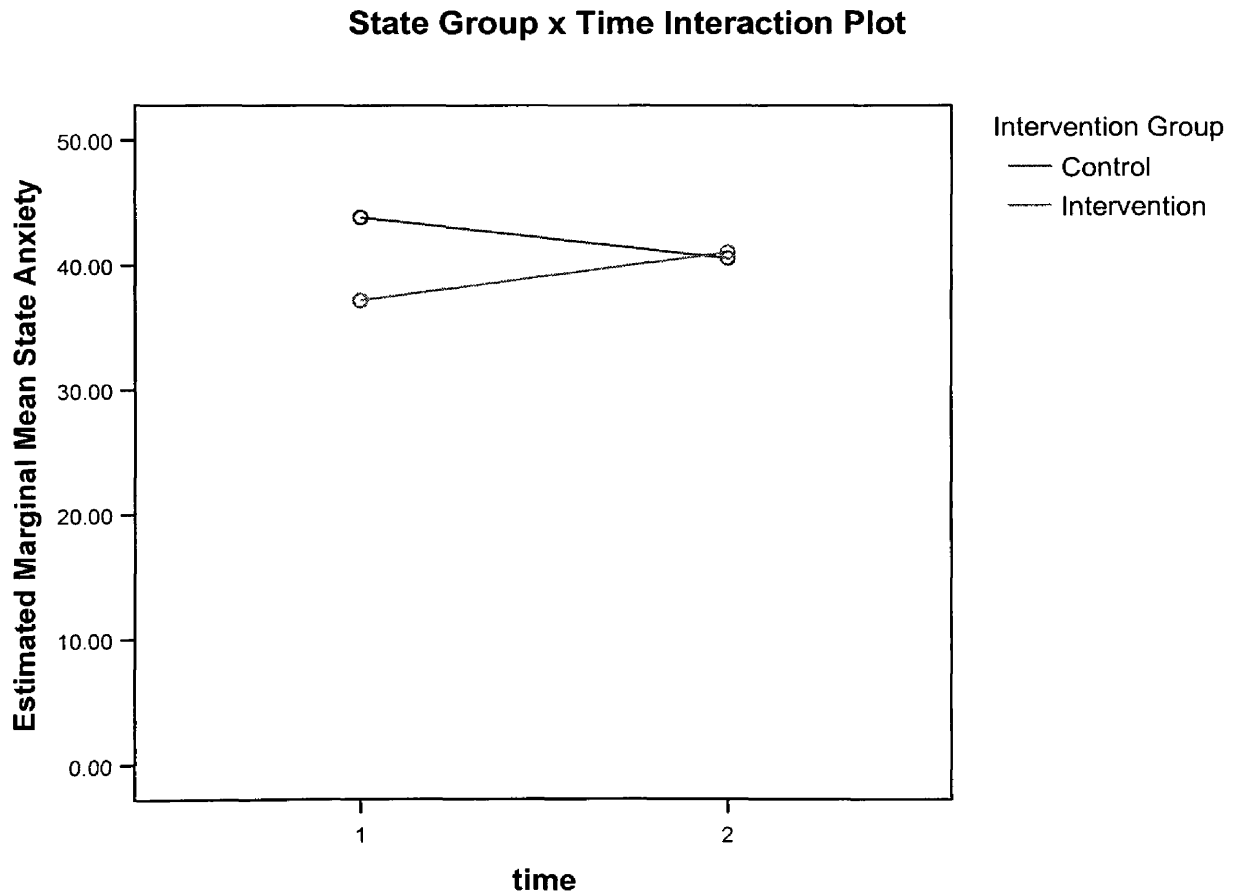


Based on the description of the results of the analysis, the post-intervention mean State Anxiety score for the control group at Time 2 was 40.56 with a Standard Deviation of 8.10. Post-intervention State Anxiety scores for the intervention group at Time 2 were a mean of 41.04 with a standard deviation of 11.61. Trait anxiety scores at Time 2 for the control group revealed a mean Trait anxiety score of 44.44 with a standard deviation of 7.02 and a mean of 37.00 with a standard deviation of 11.37 for the intervention group.

State Anxiety Repeated Measures Analysis of Variance

There was no significant overall effect of Time between the control and intervention groups. There also was no significant interaction of group with time ($p = 0.243$), but there was weak evidence of a possible interaction that might be detected with larger sample sizes (power was 22% in this study). There was also no significant difference between the groups overall. Figure 2 (below) represents these findings.

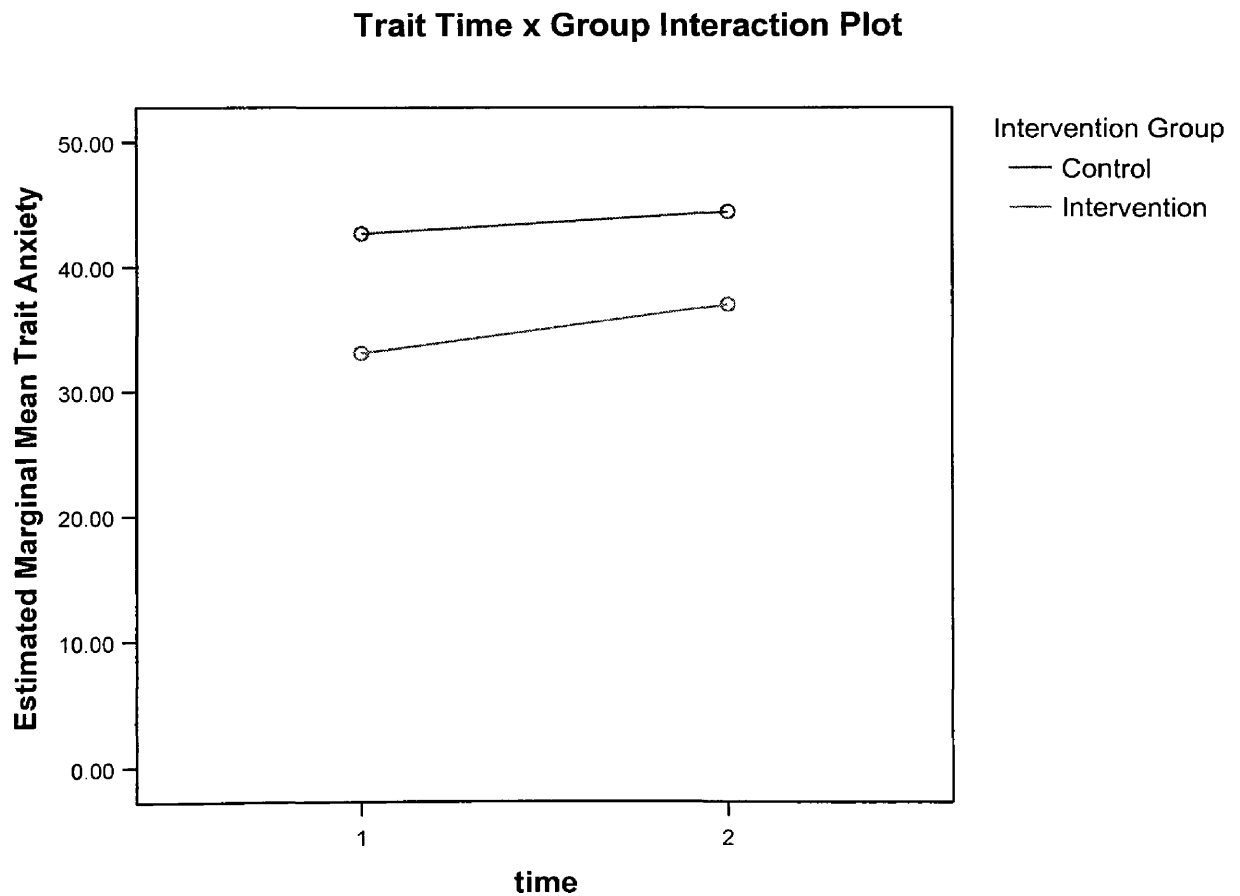
Figure 2.



Trait Anxiety Repeated Measures Analysis of Variance

There was marginal evidence of an overall effect of Time ($p = 0.11$) between the two groups, with mean values tending to increase over time in both groups. There was no significant interaction between Time and Group. Finally, there was a significant difference between the two groups overall, with the Control group having a mean that was consistently higher than the intervention group. The mean difference was about 8.5 ($p = 0.014$). Figure 3 (below) depicts these findings.

Figure 3.



Chapter 5. Discussion

The purpose of this study was to determine whether or not weekly telephone follow-up calls, with a focus on the patient's feelings after myocardial infarction, were effective in decreasing depression and anxiety in this patient population. This chapter provides an interpretation of study findings and the significance of these findings for nursing research and clinical practice. Limitations of the study are discussed and recommendations for future studies based on the study findings are suggested.

The study hypothesized that depression and anxiety would be decreased in the study subjects receiving frequent telephone follow-up calls. The first major result of this study was that, over time, patients levels of depression decreased significantly, regardless of group assignment. Participants in both the control and intervention groups reported lower levels of depression at 6 weeks following hospital discharge, as evidenced by their scores on the BDI. Although the drop was significant (an average score decrease of 2.4), the drop was the same in each group. These findings are similar to those of Mayou and colleagues who found that depression did improve at 3 months post myocardial infarction (Mayou, Gill, Thompson, Day, Hicks, Volmink, et al., 2000).

The second major finding of this report was that there was no change in state anxiety over time in either the control or intervention group. State anxiety remained the same over time with no noticeable differences ($p=0.23$) in either group based on the inventory scores. These results are consistent with the findings of VanElderen and colleagues who found that there was no effect on depression or anxiety following weekly telephone calls for a period of six weeks after discharge from the hospital (VanElderen, T, Maes, S., & VandenBroek, Y., 1994).

Thirdly, trait anxiety tended to increase over time in both groups. There was evidence of a significant difference ($p=0.014$) between the two groups at hospital discharge and at 6 weeks post discharge, with participants in the control group showing consistently higher levels of trait anxiety.

Internal Validity

Internal Validity is defined as the degree to which it can be inferred that the experimental treatment, rather than uncontrolled, extraneous factors, is responsible for observed effects (Polit & Beck, 2004). In other words, the independent variable is truly causing or influencing the dependent variable and that the relationship between the two is not the spurious effect of an extraneous variable. For the purposes of this research project, the independent variable was defined as the myocardial infarction. The dependent variable was defined as the depression or anxiety experienced by the patient after suffering a myocardial infarction. Extraneous variables such as age, previous history of depression or anxiety, as well as previous history of myocardial infarction were controlled, based on inclusion and exclusion criteria.

With quasi-experimental designs, the researcher must contend with competing explanations for the obtained results. These competing explanations, referred to as threats to internal validity, have been grouped into several classes, a few of which are examined here.

History: The threat of history refers to the occurrence of external events, which happen at about the same time as the introduction of the independent variable that can affect the dependent variable (Polit & Hungler, 1991). An example that may apply to this

research project could include a nationwide campaign recognizing depression and anxiety as normal recovery processes after myocardial infarction.

Maturation: Maturation refers to processes occurring within the subjects during the course of the study as a result of time rather than as a result of a treatment or independent variable. Examples of such processes include physical growth, emotional maturity, fatigue, and any other processes that occur within the individual as a function of time (Polit & Hungler, 1991). Thus, depending on severity, it may be possible that improvement in depression and anxiety post-myocardial infarction could occur with little to no nursing or medical intervention. This must be considered as an explanation for outcomes to subjects that rivals an explanation based on the effects of a treatment.

Testing: refers to the effects of taking a pretest on subject's performance on a posttest. It has been documented in numerous studies, particularly in those dealing with opinions and attitudes, that the mere act of collecting information from people changes those (Polit & Beck, 2004). Pre and post-testing was utilized in this research study. The first administration of the test may have sensitized the subjects, resulting in attitude changes regardless of whether an intervention followed. Sensitization, or testing, problems are more likely to occur when pretest data come from self-reported questionnaires, especially if the questionnaires are related to controversial or socially unacceptable material. The content of the questionnaires utilized in this study were related to depression and anxiety, and the patient's own interpretation of those symptoms.

Instrumentation: This bias reflects changes in the researchers measuring instruments between an initial point of data collection and a subsequent point (Polit & Hungler, 1991). This threat to internal validity was controlled for in this research study

by utilizing the same instruments to measure depression and anxiety at both the pre and post-testing time points.

Mortality: Refers to the differential loss of subjects from comparison groups (Polit & Beck, 2004). Several subjects declined to complete the posttest survey, even though an incentive was offered.

Selection Bias: This threat to internal validity results from preexisting differences between groups under study; the differences affect the dependent variable in ways extraneous of the effect of the independent variable (Polit & Beck, 2004). Selection Bias was somewhat controlled through strict definition of inclusion and exclusion criteria.

External Validity

The extent to which a study's results can be generalized to other people or settings reflects its external validity. A study is externally valid to the extent that the sample is representative of the broader population, and the study setting and experimental arrangements are representative of other environments (Polit & Beck, 2004). Study findings can best be generalized to the population from which the population has been selected at random. Four factors that may adversely affect this study's external validity have been identified: (1) Interaction: The subjects were not randomly selected from a population; therefore their particular demographic characteristics may bias their performance. (2) Pre-testing: May have caused the subjects to react more or less strongly to the treatment than they would have had they not experienced the pretest. (3) Setting: Subject awareness of being in a research study may cause them to react differently than when they are not involved in a study. (4) Multiple treatments: Early treatments may have a cumulative effect on the subject's performance. To better achieve

external validity in this study, the researcher attempted to establish a linear cause and effect relationship between the independent and dependent variable, in this case, depression, anxiety and myocardial infarction, which are strong enough to be demonstrable across a range of real world contexts. One final way of improving external validity was to ensure that the samples of people who took part in the study were representative of the population of interest (Huitt, Hummel, & Kaeck, 1999). For the purposes of this study, the population of interest was patients experiencing myocardial infarction in a mid-west city.

Implications for Nursing Practice

Although depression and anxiety were not predictive of prognosis in the present study, they remain a cause for concern in the MI patient. Symptom management is a major focus of nursing care. Because nurses provide direct care, they are in a unique position to help patients identify and manage their symptoms of depression and anxiety. Early recognition of these symptoms would identify a sizable group of patients at high risk for poor outcomes. The results of this study provide healthcare professionals with knowledge regarding the relationships between depression, anxiety, and myocardial infarction.

The current study has highlighted the importance of psychological and physical coping strategies. Nurses have the potential to extend their support to the post-discharge recovery phase. This may be achieved by follow-up calls by nurses or establishing phone help that the patient could call to discuss any feelings or concerns. The American College of Cardiology, in their Guidelines for the management of patients with ST-elevation MI executive summary state that the psychological status of the patient should

be evaluated, including inquires regarding the symptoms of depression, anxiety, or sleep disorders and the social support environment. In fact, the American College of Cardiology recommends that either formal or informal telephone follow-up be instituted at 1 week intervals for the first 4 weeks after discharge to reinforce in-hospital instruction, provide reassurance, and answer the patient's questions. This structured program can gauge the progress of the patient's recovery; reinforce the CAD education taught in the hospital, address patient questions and concerns, and monitor progress in meeting risk factor modification goals (Antem, Anbe, Armstrong, et al., 2004).

Limitations of the Study

The study has several limitations. The results of the study are limited in their generalization because of the convenience sample. The lack of random sampling may contribute to sample selection bias and limits the generalization of the findings. The sample may have been biased toward patients who have had a myocardial infarction for the first time, which limits generalizing the findings to all MI patients.

Small sample size is also a major limitation of the current study. The sample size needs to be expanded to ensure a more diverse sample and representation of the population. This study was limited due to the majority of the subjects being Caucasian. Expansion of the sample size would allow for a more diverse sample, which would, in turn, represent the population more closely.

Another limitation of the study is the use of measures that require subjects to fill out the study questionnaires. Possible reactivity in completing the questionnaire in a socially desirable direction can occur. To manage this, the investigator reminded the subjects that there was no right or wrong answer and emphasized the importance of

responding to the study questionnaire honestly. In addition, information regarding a prior history of anxiety or depression should have been collected from each study participant.

Also, this study was restricted to one principal investigator to collect and obtain all the data. This necessarily limited the research by confining the amount of time and resources available to one person. Additional researchers would decrease the biases that exist with only one researcher. Together with additional researchers, a larger and more extensive study could possibly be obtained and allow for generalization to a larger population.

Recommendations for Future Research

Findings from this study provide valuable information about depression and anxiety symptoms following MI. This information can be used to design interventions to manage depression and anxiety during the recovery period. Further research should be done to test the feasibility and effectiveness of nurse-initiated telephone follow-up after hospital discharge for acute myocardial infarction in reducing patient depression and anxiety. Further clinical trials could also determine whether telephone follow-up by nurses increases patient satisfaction with the health care delivery system. Such information would provide cardiovascular nurses with a valuable foundation for the development of interventions to facilitate transition to wellness among AMI survivors in the vulnerable period after hospital discharge.

Telephone follow-up calls after AMI will require more exploration, refinement, and testing. This model could be tested on other patient populations with chronic health conditions that suffer a severe life-threatening exacerbation and who are required to learn new skills in order to make a satisfactory adjustment. Through refinement and testing,

others factors might be identified that should be added to the model. Replication of this study is recommended with several design changes. For example, the use of random selection is recommended to achieve appropriate representation of the population. The present study included the restriction to one particular hospital. The findings, therefore, can not be generalized. Moreover, the patients were assessed only for 6 weeks following AMI; therefore, it is difficult to determine whether symptoms of depression and anxiety were short-lived or long-lasting. In addition, not enough studies have been done to include advanced practice nurses even though they are responsible for health promotion, assessment, and treatment of depression and anxiety. Because most research has been done with physicians, it might be useful to discover how Nurse Practitioners, who have established a trusting relationship with the patient, compare to physicians in the recognition and treatment of anxiety and depression following myocardial infarction.

Conclusion

Depression and anxiety are often under-diagnosed and untreated in patients with AMI. The results of a number of studies indicate that depression and anxiety represent both risk factors for AMI and predictors for poorer outcomes following it. The BDI and STAI evaluation tools have been shown to be a value in assessing patients for depression and anxiety; however, because they require time to administer and resources to evaluate their results, they are often not used in patients with AMI. Given the important role that depression and anxiety play as risk factors for increased post-AMI morbidity and mortality, providers should give increased attention to the use of these or similar evaluation assessments in patients.

The role of the Nurse Practitioner is to act as an advocate for those patients experiencing depression and anxiety, through therapeutic listening, providing treatment solutions, and aggressively treating the disorder. Findings from this study may significantly impact the development of nursing interventions designed to address effective symptom management during the recovery process following AMI. Because Nurse Practitioners provide direct care, they are in a unique position to recognize and treat anxiety and depression during the recovery period.

References

- Antem, E., Anbe, D., Armstrong, P., Bates, E., Green, L., Hand, M., Hochman, J., Krumboltz, H., Kushner, F., Lamas, G., et al. (2004). Management of patients with STEMI: Executive Summary. *Journal of the American College of Cardiology*, *44*, 671-719.
- Beck, A.T., Steer, R.A., & Garbin, M.G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review*, *8(1)*, 77-100.
- British Heart Foundation Guidelines. (2002). Psychological and Educational Interventions. Retrieved from the internet March 28, 2005 from <http://www.sign.ac.uk/guidelines/fulltext/57/section2.html>
- Buselli, E.F. & Stuart, E.M. (1999). Influence of psychosocial factors and biopsychosocial interventions on outcomes after myocardial infarction. *The Journal of Cardiovascular Nursing*, *13(3)*, 60-72.
- Bush, D.E., Ziegelstein, R. C., & Tayback, M. (2001). Even minimal symptoms of depression increase mortality after acute myocardial infarction. *American Journal of Cardiology*, *88*, 337-341.
- Carney, R.M., Freeland, K.E., & Stein, P.K. (2000). Change in heart rate and heart rate variability during treatment for depression in patients with coronary heart disease. *Psychosomatic Medicine*, *62*, 639-647.
- Carrieri, V.K., Lindsey, A.M., & West, C.M. (1986). The conceptual approach. In M. Brown & A. Sorkowitz (Eds.), *Pathophysiological phenomena in nursing: human responses to illness* (pp. 4-10). Philadelphia, PA: W.B. Saunders.

Consulting Psychologists Press, Inc. (2007). State Trait Anxiety Inventory. Retrieved March 10, 2007 from <http://cps.nova.edu/~cpphelp/STAI.html>

Daly, J., Elliot, D., Traub, E., Salamonson, Y., Davidson, P., Jackson, D., Chin, C., Wade, (2000). Health status, perceptions of coping, and social support immediately after discharge of survivors of acute myocardial infarction. *American Journal of Critical Care, 9(1)*, 62-70.

Davies, S., Jackson, P., Potokar, J., & Nutt, D. (2004). Treatment of anxiety and depressive disorders in patients with cardiovascular disease. *British Medical Journal, 328*, 939-943.

DiMatteo, M.R., Lepper, H.S., & Croghan, T.W. (2000). Depression is a risk factor for non-compliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. *Archives of Internal Medicine, 160*, 2101-2107.

Frasure-Smith, N., Lesperance, F., Gravel, G., Masson, A., Juneau, M. Talajic, M. & Bourassa, G. (2000). Depression and health care costs during the first year following myocardial infarction. *Journal of Psychosomatic Residency, 48*, 471-478.

Frasure-Smith, N., Lesperance, F., & Juneau, M. (1999). Gender, depression, and one-year prognosis after myocardial infarction. *Psychosomatic Medicine, 61*, 26-37.

Frasure-Smith, N., Lesperance, F., & Talajic, M. (1993). Depression following myocardial infarction. *Journal of the American Medical Association, 270*, 1819-1825.

Frasure-Smith, N., Lesperance, F., & Talajic, M. (1995). Depression and 18-month

prognosis after myocardial infarction. *Circulation*, 91, 99-105.

Guck, T., Michael, G., Elsasser, G., & Barone, E.J. (2001). Assessment and treatment of depression following myocardial infarction. *American Family Physician*, 64(4),

641-649.

Guiry, E., Conroy, R.M., Hickey, N., et al. (1987). Psychological response to an acute coronary event and its effect on subsequent rehabilitation and lifestyle change.

Clinical Cardiology, 10, 256-260.

Huffman, J., Smith, I., Blais, M., Beiser, M., Januzzi, J., & Fricchone, G. (2006)

Recognition and treatment of depression and anxiety in patients with acute myocardial infarction. *The American Journal of Cardiology*, 98, 319-324.

Huitt, W., Hummel, J., & Kaeck, D. (1999). Internal and External Validity: General

Issues. Retrieved May 23, 2005, from

<http://chiron.valdosta.edu/whuitt/col/intro/valdgn.htm>

Jiang, W., Alexander, J., Christopher, E., & Kuchibhatla, M. (2001). Relationship of depression to increased risk of mortality and re-hospitalization in patients with congestive heart failure. *Archives of Internal Medicine*, 161, 1849-1856.

Kim, K.A., Moser, D., Garvin, B., Riegel, B., Doering, L., Jadack, R., McKinley, S.,

Schueler, A., Underman, L., & McErlean, E. (2000). Differences between men and women in anxiety early after acute myocardial infarction. *American Journal*

of Critical Care, 9(4), 245-254.

Ladwig, K.H., Roll, G., Breithardt, G., Budde, T., & Borggrete, M. (1994). Post-

infarction depression and incomplete recovery 6 months after acute myocardial infarction. *The Lancet*, 343(8888), 20-23.

- Lane, D., Carroll, D., Ring, C., Beevers, D.G., & Lip, G.Y.H. (2000). Do depression and anxiety predict recurrent coronary events 12 months after myocardial infarction? *QJM*, *93*, 739-744.
- Lauson, C., Beck, C., Huynh, T., Dion, D., Racine, N., Carignan, S., Diodati, J., Charbonneau, F., Dupuis, R., & Pilote, L. (2003). Depression and prognosis following hospital admission because of acute myocardial infarction. *Canadian Medical Association Journal*, *168*(5), 547-553.
- Malach, M., & Imperato, P. (2004). Depression and acute myocardial infarction. *Preventive Cardiology*, *7*(2), 83-92.
- Markovitz, J.H., Shuster, J.L., Chitwood, W.S., May, & Tolbert. (2000). Platelet activation in depression and effects of sertaline treatment: an open-label study. *American Journal of Psychiatry*, *157*, 1006-1008.
- Martin, N. & Thompson, R. (2002). A psychometric evaluation of the hospital anxiety and depression scale in coronary care patients following acute myocardial infarction. *Psychology, Health, & Medicine*, *5*(2), 193-202.
- Mayou, Mayou, R., Gill, D., Thompson, D., Day, A., Hicks, N., Volmink, J., & Neil, A. (2000). Depression and anxiety as predictors of outcome after myocardial infarction. *Psychosomatic Medicine*, *62*, 212-219.
- Miller, N.H., Hill, M., Kottke, T., Ockene, I. (1997). The multi-level compliance challenge: recommendations for a call to action, a statement for healthcare professionals. *Circulation*, *95*, 1085-1090.
- Nease, D.E. & Malouin, J.M. (2003). Depression screening: a practical strategy. *The Journal of Family Practice*, *52*(2), retrieved from the internet April 6, 2005 from

http://www.jfponline.com/content/2003/02/jfp_0203_00118.asp

- O'Brien, J., Moser, D., Riegel, B., Frazier, S., Garvin, B., & Kim, K. (2001). Comparison of anxiety assessments between clinicians and patients with acute myocardial infarction in cardiac critical care units. *American Journal of Critical Care, 10*(2), 97-104.
- Polit, D.F., & Beck, C.T. (2004). Designs for nursing research. In M. Zuccarini & B. Cunningham (Eds.), *Nursing research: Principles and methods* (7th ed.), Philadelphia, PA: Lippincott Williams & Wilkens.
- Polit, D. F., & Hungler, B.P. (1991). Designs for nursing research. In D. Carroll & A. Stonehouse (Eds.), *Nursing research: Principles and methods* (4th ed., pp. 151-171). Philadelphia, PA: Lippincott Williams & Wilkens.
- Ross, & Cobb. (1990). *Family nursing: A nursing process approach*. Redwood City, California: Addison-Wesley Nursing.
- Ruo, B., Rumsfeld, J.S., Hlatky, M.A., & Liu, H. (2003). Depressive symptoms and health-related quality of life. The Heart and Soul Study. *Journal of the American Medical Association, 290*, 215-221.
- Taleff, M.J. (2001). A different kind of research. *Counselor*, February, 52-53.
- Taylor, D.K., Barber, K.R., McIntosh, B.A., & Khan, M. (1998). The impact of post acute myocardial infarction (AMI) depression on patient compliance and risk factor modification. *Psychology, Health, and Medicine, 3*(4), 439-443.
- Thornto, L. (2001). Depression in post-acute myocardial infarction patients. *Journal of the American Academy of Nurse Practitioners, 13*(8), 364-368.
- U.S. Department of Health and Human Services. (2000). *Healthy People 2010*:

Understanding and Improving Health. 2nd Ed. Washington D.C.: U.S.

Government Printing Office, November 2000.

Valentine, D., Byers, J., & Peterson, J. (2001). Depression as a risk factor for coronary heart disease: Implications for Advanced Practice Nurses. *Topics in Advanced Practice Nursing eJournal*, 1(3). Retrieved from the internet March 28, 2005, from <http://www.medscape.com/viewarticle/408416>

VanElderen, T, Maes, S., & VandenBroek, Y. (1994). Effects of a health education programme with telephone follow-up during cardiac rehabilitation. *British Journal of Clinical Psychology*, 33, 367-378.

Whitehead, D., Strike, P., Perkins-Porras, L., & Steptoe, A. (2005). Frequency of distress and fear of dying during acute coronary syndromes and consequences for adaptation. *American Journal of Cardiology*, 96, 1512-1516.

Yates, A., & Gill, D. (1998). Does psychiatric depression worsen cardiovascular outcome after myocardial infarction? A systematic review. Retrieved from the internet March 23, 2005 from <http://www.cochrane.org/colloquia/abstracts/baltimore/marylandB27.htm>

Ziegelstein, R.C., Fauerbach, J. A., Stevens, S.S., & Romanelli, J. (2000). Patients with depression are less likely to follow recommendations to reduce cardiac risk during recovery from a myocardial infarction. *Archives of Internal Medicine*, 160, 1818-1823.

Ziegelstein, R.C. (2001). Depression in patients recovering from a myocardial infarction. *Journal of the American Medical Association*, 286, 1621-1627.

Appendix A

Informed Consent

Appendix A: Informed Consent

Name of Investigator: Beth A. Sheridan, RN, BSN
Janet Barnfather, PhD, RN

Address: University of Michigan-Flint
Department of Nursing
2180 William S. White Building
Flint, MI 48502

Title: The Assessment of Depression and Anxiety after Heart Attack

Who I am and What the Study is About: I am a graduate nursing student doing a research project about adults who have had a heart attack. Please read this paper that tells you about the study and you give your permission to be in the study.

Your Part in the Study: While in the hospital, you will be asked if you want to take part in this study. If you want to take part in this study, I will ask you about health problems and operations you have had in the past. I will also ask you about your job, if you are married, and how many children you have. You will be asked to fill out two surveys, which will take about 30 minutes. You will fill out the surveys in your hospital room and later again in your own home, at a time that is good for you. These surveys will ask about any feelings of anxiety or depression you may be having. If a question makes you feel uncomfortable, you do not have to answer it. The second part of this study takes place after your discharge from the hospital. If you agree to take part in this study, you will be put in one of two groups: a control group (fill out the surveys) or intervention group (You will be called once a week for 6 weeks). The first person that signs up for the study will be put into the control group, the second person will be put into the intervention group, the third to the control group, and so on, until I have 30 people in each group. If you are in the intervention group, I will call you every week to ask you about any other times you are put in the hospital, or other procedures you may have had. I will also ask you about any feelings of anxiety or depression you may be having. You will have a chance to ask any questions you may have. Each of these phone calls will take about 20 minutes. If you are in the control group, you will not be called. At 6 weeks after you left the hospital the first time, **all** persons in the study will get by mail the same two surveys that they filled out in the hospital. Fill out and send me the surveys in the stamped envelope with my address.

How long you will be in the Study: Your part in the study will begin at the time you sign this consent form. Your part ends 6 weeks after you left from this hospital visit. Each of our visits together, whether while you are in the hospital or at home on the telephone, will last about 30 minutes. There will be a minimum of two visits, and a maximum of 6 visits.

Chances of Problems and Discomforts: There are no problems likely from being part of this study. If any of the questions I ask upset you, you do not have to answer them. There are no other health problems.

Rewards: There may be no reward to you for being part of this study. What we learn may help us to better treat patients with heart attacks in the future.

Costs: There will be no cost to you for taking part in the study.

Payment for Being Part of the Study: A coupon for \$10.00 in gas will be mailed to you after I receive the filled out surveys in the mail 6 weeks after you left the hospital. I will ask you where you would like the surveys and gas coupon mailed before you leave the hospital. No coupon will be mailed to persons who do not return the surveys.

How your information is kept private: If you agree to be part of the study, I will ask you these personal questions: your name, birth date, address, and phone number, about any health problems and operations you had; if you are married, widowed or divorced; if you have children; and if you have a job. I will not use your name on any study paper work. Your information will be kept as private as possible. But, the people who watch over studies at the University of Michigan-Flint and/or Covenant Healthcare may look at this study paper work at any time.

Your Choice to be Part of the Study: Taking part in this study is your choice. You may choose not to take part in this study. Even after you sign this consent, you may quit the study at any time. You will not be punished or lose any regular benefits. You may skip or refuse to answer any survey question that makes you feel uncomfortable and still be paid for your part in the study.

Who to Call for Questions: If you have any questions about this study, you may call my teacher or me. I can be called at the University of Michigan-Flint, Department of Nursing, 2180 William S. White Building, Flint, MI 48502, and (810) 762-3420. Dr. Janet Barnfather can be called at the University of Michigan-Flint, Department of Nursing, 2180 William S. White Building, Flint, MI 48502, and (810) 766-6861.

Also, you can call or e-mail Suzy Sikora, at the University of Michigan-Flint, Institutional Review Board, 530 French Hall, 303 E. Kearsley St., Flint, MI 48502, (810) 762-3383, email sgaia@umflint.edu.

You may also call Dr. Dennis Boysen, (who watches over studies done at Covenant Healthcare, Saginaw, MI 48602, and (989) 583-6000.

Record of Permission: One copy of this paper will be kept with the study records and you will be given a copy to keep.

Permission of the person: I have read and I know what this paper means. I have had the chance to ask questions. All of my questions were answered. I know that at any time I may ask other questions. I freely agree to take part in this study.

ADULT SUBJECT OF RESEARCH:

Printed Name

Signature DATE TIME

PERSON OBTAINING CONSENT:

Signature DATE TIME

Appendix B

Recruitment Poster

Appendix B

ATTENTION:

SEEKING ACUTE MI PATIENTS

*For potential enrollment in graduate program study looking at
depression and anxiety following myocardial infarction*

PLEASE CONTACT:

BETH SHERIDAN, RN, BSN

UNIVERSITY OF MICHIGAN-FLINT

GRADUATE PROGRAM

At

(989) 245-9905

Thank You!!

Appendix C

Beck Depression Inventory

Appendix C



Name: _____ Marital Status: _____ Age: _____ Sex: _____
 Occupation: _____ Education: _____

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

<p>1. Sadness</p> <p>0 I do not feel sad.</p> <p>1 I feel sad much of the time.</p> <p>2 I am sad all the time.</p> <p>3 I am so sad or unhappy that I can't stand it.</p> <p>2. Pessimism</p> <p>0 I am not discouraged about my future.</p> <p>1 I feel more discouraged about my future than I used to be.</p> <p>2 I do not expect things to work out for me.</p> <p>3 I feel my future is hopeless and will only get worse.</p> <p>3. Past Failure</p> <p>0 I do not feel like a failure.</p> <p>1 I have failed more than I should have.</p> <p>2 As I look back, I see a lot of failures.</p> <p>3 I feel I am a total failure as a person.</p> <p>4. Loss of Pleasure</p> <p>0 I get as much pleasure as I ever did from the things I enjoy.</p> <p>1 I don't enjoy things as much as I used to.</p> <p>2 I get very little pleasure from the things I used to enjoy.</p> <p>3 I can't get any pleasure from the things I used to enjoy.</p> <p>5. Guilty Feelings</p> <p>0 I don't feel particularly guilty.</p> <p>1 I feel guilty over many things I have done or should have done.</p> <p>2 I feel quite guilty most of the time.</p> <p>3 I feel guilty all of the time.</p>	<p>6. Punishment Feelings</p> <p>0 I don't feel I am being punished.</p> <p>1 I feel I may be punished.</p> <p>2 I expect to be punished.</p> <p>3 I feel I am being punished.</p> <p>7. Self-Dislike</p> <p>0 I feel the same about myself as ever.</p> <p>1 I have lost confidence in myself.</p> <p>2 I am disappointed in myself.</p> <p>3 I dislike myself.</p> <p>8. Self-Criticalness</p> <p>0 I don't criticize or blame myself more than usual.</p> <p>1 I am more critical of myself than I used to be.</p> <p>2 I criticize myself for all of my faults.</p> <p>3 I blame myself for everything bad that happens.</p> <p>9. Suicidal Thoughts or Wishes</p> <p>0 I don't have any thoughts of killing myself.</p> <p>1 I have thoughts of killing myself, but I would not carry them out.</p> <p>2 I would like to kill myself.</p> <p>3 I would kill myself if I had the chance.</p> <p>10. Crying</p> <p>0 I don't cry anymore than I used to.</p> <p>1 I cry more than I used to.</p> <p>2 I cry over every little thing.</p> <p>3 I feel like crying, but I can't.</p>
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Subtotal Page 1

Continued on Back

11. Agitation

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

13. Indecisiveness

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

14. Worthlessness

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

15. Loss of Energy

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern

- 0 I have not experienced any change in my sleeping pattern.
- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.
- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.
- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

17. Irritability

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

18. Changes in Appetite

- 0 I have not experienced any change in my appetite.
- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.
- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.
- 3a I have no appetite at all.
- 3b I crave food all the time.

19. Concentration Difficulty

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

20. Tiredness or Fatigue

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

NOTICE: This form is printed with both blue and black ink. If your copy does not appear this way, it has been photocopied in violation of copyright laws.

_____ Subtotal Page 2

_____ Subtotal Page 1

_____ Total Score

Appendix D

State Trait Anxiety Inventory

Appendix D: State/Trait Anxiety Inventory

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-1

Please provide the following information:

Name _____ Date _____ S _____

Age _____ Gender (Circle) M F T _____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

NOT AT ALL
 SOMEWHAT
 MODERATELY SO
 VERY MUCH SO

- | | | | | |
|--|---|---|---|---|
| 1. I feel calm | 1 | 2 | 3 | 4 |
| 2. I feel secure | 1 | 2 | 3 | 4 |
| 3. I am tense | 1 | 2 | 3 | 4 |
| 4. I feel strained | 1 | 2 | 3 | 4 |
| 5. I feel at ease | 1 | 2 | 3 | 4 |
| 6. I feel upset | 1 | 2 | 3 | 4 |
| 7. I am presently worrying over possible misfortunes | 1 | 2 | 3 | 4 |
| 8. I feel satisfied | 1 | 2 | 3 | 4 |
| 9. I feel frightened | 1 | 2 | 3 | 4 |
| 10. I feel comfortable | 1 | 2 | 3 | 4 |
| 11. I feel self-confident | 1 | 2 | 3 | 4 |
| 12. I feel nervous | 1 | 2 | 3 | 4 |
| 13. I am jittery | 1 | 2 | 3 | 4 |
| 14. I feel indecisive | 1 | 2 | 3 | 4 |
| 15. I am relaxed | 1 | 2 | 3 | 4 |
| 16. I feel content | 1 | 2 | 3 | 4 |
| 17. I am worried | 1 | 2 | 3 | 4 |
| 18. I feel confused | 1 | 2 | 3 | 4 |
| 19. I feel steady | 1 | 2 | 3 | 4 |
| 20. I feel pleasant | 1 | 2 | 3 | 4 |

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name _____ Date _____

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

ALMOST NEVER
SOMETIMES
OFTEN
ALMOST ALWAYS

- | | | | | |
|--|---|---|---|---|
| 21. I feel pleasant | 1 | 2 | 3 | 4 |
| 22. I feel nervous and restless | 1 | 2 | 3 | 4 |
| 23. I feel satisfied with myself | 1 | 2 | 3 | 4 |
| 24. I wish I could be as happy as others seem to be | 1 | 2 | 3 | 4 |
| 25. I feel like a failure | 1 | 2 | 3 | 4 |
| 26. I feel rested | 1 | 2 | 3 | 4 |
| 27. I am "calm, cool, and collected" | 1 | 2 | 3 | 4 |
| 28. I feel that difficulties are piling up so that I cannot overcome them | 1 | 2 | 3 | 4 |
| 29. I worry too much over something that really doesn't matter | 1 | 2 | 3 | 4 |
| 30. I am happy | 1 | 2 | 3 | 4 |
| 31. I have disturbing thoughts | 1 | 2 | 3 | 4 |
| 32. I lack self-confidence | 1 | 2 | 3 | 4 |
| 33. I feel secure | 1 | 2 | 3 | 4 |
| 34. I make decisions easily | 1 | 2 | 3 | 4 |
| 35. I feel inadequate | 1 | 2 | 3 | 4 |
| 36. I am content | 1 | 2 | 3 | 4 |
| 37. Some unimportant thought runs through my mind and bothers me | 1 | 2 | 3 | 4 |
| 38. I take disappointments so keenly that I can't put them out of my mind | 1 | 2 | 3 | 4 |
| 39. I am a steady person | 1 | 2 | 3 | 4 |
| 40. I get in a state of tension or turmoil as I think over my recent concerns
and interests | 1 | 2 | 3 | 4 |

Appendix E

Data Log

Appendix F

Demographic Log

Appendix G

Telephone Follow-up Questionnaire

Appendix G: Telephone Follow-up Questionnaire
(For use during telephone follow-up calls to intervention group)

Date: _____

Time: _____

“Hello. This is Beth Sheridan, the Nurse Practitioner student from the University of Michigan-Flint. I spoke to you in the hospital about being part of my research study. If you would still like to participate, I would like to ask you some brief questions. Is this a good time? If not, when would be a good time to call back?”

1. Have you been re-hospitalized for any cardiovascular reason since our last conversation?

2. Have you had any heart related procedures since our last conversation? If yes, please name the procedure.

3. In general, how are you feeling?

4. Have you had any feelings of depression or anxiety?

5. Do you have any questions or concerns that you would like to discuss with me now?

_____ No questions or concerns.

_____ Yes. Subject had the following question/concern.

Content of Beth’s response to subject:

Referral: _____ Comments: _____

Date and time of next follow-up phone call: _____

Signature: _____ Date: _____

Appendix H

Recruitment Script

Appendix H. Recruitment Script

“Hi. I’m Beth Sheridan. I’m interested in learning more about patients like you, who have suffered a heart attack. I am currently doing a study to see if depression and anxiety, sometimes experienced after a heart attack, can be reduced by follow-up phone calls after discharge. There are three parts to this study. First, I will ask you questions regarding your past medical and surgical history. I will also collect information regarding your marital and employment status, and the number of children you have. Secondly, I will ask you to complete two questionnaires, which will take about 30 minutes. After discharge from the hospital, half of the study participants will be contacted via telephone once weekly for 6 weeks. Each of these weekly phone calls will last approximately 10 minutes. During these 10 minute phone calls, I will ask you how you are feeling, particularly whether or not you are feeling anxious or depressed. I will also ask if you have been re-hospitalized for any reason. You will be given the opportunity to ask questions and voice concerns. The other half of study participants will not be contacted during these 6 weeks, instead, at 6 weeks following hospital discharge, the same two questionnaires that you completed in the hospital will be mailed to your home, to be completed and returned to me in a self-addressed stamped envelope. Participants who received weekly phone calls for 6 weeks will also have the questionnaires mailed to their homes 6 weeks after discharge. These questionnaires will be completed and returned to me in a self-addressed stamped envelope.”