Psychological Well-Being and Heart Disease: The Utility of Mental Health and Management Plans

By

Jennifer Anne Heath

Bachelor of Arts
Psychology
New England College
2010

Master of Arts
Clinical Psychology
Roger Williams University
2013

Master of Science
Psychology
Florida Institute of Technology
2015

Doctoral Research Project Submitted to the School of Psychology at
Florida Institute of Technology
In partial fulfillment of the requirements for the degree of

Doctor of Psychology

Melbourne, FL
November, 2016

We the undersigned committee
Hereby approve the attached doctoral research project

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Management Plans

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Jennifer Anne Heath

_____   _____
Linda Garcia-Shelton, Ph.D.   John Lavelle, Ph.D.
Former Program Chair   Associate Professor
School of Psychology   School of Arts and Communication
Committee Chair   Committee Member

_____   _____
Maria Lavooy, Ph.D.   Mary Beth Kenkel, Ph.D.
Associate Professor   Professor and Dean
School of Psychology   School of Psychology
Committee Member

Abstract

Title: Psychological Well-Being and Heart Disease: The Utility of Mental Health

and Management Plans

Author: Jennifer Anne Heath

Major Advisor: Linda Garcia-Shelton, Ph.D.

This paper explores the correlation between mental health and coronary heart disease (CHD) and the usefulness of including mental health treatment into disease management plans. Consistent with previous research and literature regarding the correlation between CHD and depression, results suggest individuals experiencing CHD experience more symptoms of depression, including feelings of hopelessness and worthlessness. Additionally, individuals with CHD also tend to experience more difficulty with relationships and completing household chores. Individuals who have management plans created by their healthcare providers experience less depressive symptoms than those without management plans. This suggests management plans are crucial in the treatment of mental health difficulties and CHD, and that treatment for mental health difficulties with those experiencing CHD should vary between men and women.

Keywords: depression, coronary heart disease, management plans

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Acknowledgements

I would like to express my sincere gratitude to the chair and committee members who worked tirelessly alongside me through this project. I have had the chance to learn and grow not only as a student, but as a researcher, and owe much credit to the knowledge and guidance of my committee. I would especially like to thank the chair of my research project, Dr. Linda Garcia-Shelton, who was a source of immense guidance through this project. I am thankful to have worked under such a patient and knowledgeable individual. I would also like to thank my committee members, Dr.'s Maria Lavooy and John Lavelle, who gave their time to help me achieve my goals and produce a piece of work I am truly proud of. I would also like to thank Dr. Lavooy for helping me find my interest and passion in psychology and healthcare, as I intend on using this knowledge and interest in future endeavors.

I would also like to thank my husband, Sameer Shah, who continuously encouraged my through difficulties, held my hand over hurdles, and never let me give up. I could not have done it without you! I would also like to include my mother, Lorraine Swislosky, and my three older brothers, Peter, James, and Daniel Swislosky, who have always been a source of support and encouragement.

Psychological Well-Being and Heart Disease: The Utility of Mental Health and

Management Plans

Heart disease is an ailment that affects men and women around the world.

Heart disease is defined as problems stemming from a process called

atherosclerosis, a condition that develops when plaque builds up in the walls of the

arteries. The buildup of plaque then narrows the arteries, making it more difficult

for blood to flow. This raises the risk of a blood clot forming, or the plaque

breaking from the wall of the artery and flowing into other arteries, potentially

stopping the flow of blood and leading to a heart attack or stroke ("What is a heart

attack?," 2015). Approximately every 25 seconds somebody in the United States

will have a heart attack (Go et al., 2013). According to the University of California

– San Francisco Medical Center (2015), approximately 35% of all deaths in the

United States are related to some form of cardiovascular disease. While many of

the medical interventions for heart disease focus on physiological changes such as

weight loss and diet changes, few interventions focus on psychological factors.

This study will explore psychological factors that may exacerbate the effects of

cardiovascular disease and explore ways to integrate psychological interventions

into overall cardiac treatment to reduce the risk of further complications, or worse,

death.

The following narrative will explore previously collected and explored

information regarding mental health difficulties and heart disease such as:

depression, anxiety, hopelessness, and quality of life; how heart disease and

psychological states interfere with daily activities such as employment, maintaining the home, and socialization; and literature surrounding the current use of heart disease management plans. Additionally, literature exploring gender differences will be included. Gender differences will be explored due to the prevalence of heart disease in women and research suggesting heart disease to be the leading cause of mortality in women in the United States (Go et al., 2013). Heart disease is responsible for approximately 292,000 female deaths each year ("Heart disease fact sheet," 2015). Within this study, the term "Coronary Heart Disease (CHD)" will be used throughout, but will be inclusive of the term "Coronary Artery Disease." Other cardiac events, such as heart attacks, will be identified separately.

Mental Health and Coronary Heart Disease

Much of the literature focuses on how depression correlates with heart disease. The prevalence of major depression in individuals with heart disease is approximately 15-23% (3-9% in a study by Ormel et al., 2007) even up to 40% in some studies (Frasure-Smith & Lesperance, 2008) as compared to the general population prevalence of 4.6%. Depression appears to be a powerful predictor of quality of life following a heart attack - a much more powerful predictor than even cardiac functioning following a heart attack (Lawton et al., 2014). Kent and Shapiro (2009) identified four observations between CHD and depression. First is that CHD and depression are the two leading causes of disease burden worldwide (Murray & Lopez, 1997). Second, depression often increases the risk of an

individual developing CHD. Third, individuals with CHD and depression are at an increased risk of subsequent morbidity and death. Fourth and last, depression occurs more frequently in individuals with CHD than expected by chance (Glassman & Shapiro, 1998). A disconnection between studies in terms of reporting more mild depression symptoms seems to exist (such as dysthymia or symptoms not severe enough to warrant a diagnosis of major depressive disorder), as some studies suggest lower incidence of minor depression than others. Lawton et al. (2014) found rates of minor depression to be approximately 5%, while Hance, Carney, Freeland, & Skala (1996) found the rate to be approximately 17% for minor depression.

Kent and Shapiro (2009) suggested a person with a recent diagnosis of heart disease, or any other major stressful life event for that matter, may experience some form of an adjustment disorder. However, persistent depression has been found to be common in individuals suffering from CHD. In a study by Hance, Carney, Freeland, & Skala (1996), 17% of people diagnosed with coronary heart disease were found to meet criteria for major depressive disorder, and 17% met criteria for minor depression. The study was conducted to determine if depression rates increased, decreased, or remained the same over a one-year period. With respect to full remission, results indicated that individuals who met criteria for major depression, 23% were in full remission after one year, and of the individuals who met criteria for minor depression, 50% were in full remission. With respect to partial remission, 27% of individuals who met criteria for major depression were in

partial remission, while none of the people who met criteria for minor depression were in partial remission. Lastly, of the individuals diagnosed with major depression, 31% reported persistent depression with zero individuals reporting persistent minor depression. Importantly, the study found 19% of individuals diagnosed with major depression and 8% of individuals diagnosed with minor depression had experienced a relapse of their depression within the one-year period.

With such high prevalence rates and variable remission rates it is important to better understand how depression can affect an individual diagnosed with heart disease. Kent and Shapiro (2009) found studies dating back to the 1950's that connected depression with higher death rates due to cardiovascular disease compared to the general population. Additionally, Anda, et al. (1993) found evidence that depressed affect or hopelessness increased the risk of fatal and nonfatal CHD, and that the risk of CHD increases as an individual's hopelessness increases. Anda et al. explained depression can affect the heart rate, which has been linked to the autonomic function that can increase the risk of ventricular fibrillation. In healthy male individuals, a depressed affect may be associated with the risk of ventricular arrhythmias. In general, anger, which is often a symptom of depression in men (Winkler, Pjerk, and Kasper, 2005) and psychological discomfort can be connected to ventricular arrhythmias and may produce cardiac events (Anda et al., 1993).

In an interesting study by Pennix et al. (2001), a comparison of adverse cardiac effects of depression on individuals who have been diagnosed with CHD

and those without, found no evidence of a stronger effect of depression on those with CHD and those without, suggesting the risk of mortality due to a heart problem is similar in people with and without heart disease who suffer from depression. However, the researchers did find a difference in the effect the level of depression has on cardiac mortality. The risk of cardiac death was found to be twice as high in individuals who have major depression than those with minor depression.

Additionally, individuals with or without CHD who have depression or depressive symptoms often have behaviors that make their mortality more likely. These behaviors include smoking, lack of exercise, and poor diet. In cardiac patients, depression is likely to interfere with health care recommendations and medication adherence, as well as interfere with suggested healthful behaviors such as diet and exercise. Recovering from depression or reducing depressive symptoms has been suggested to aid in adherence to medical recommendations. This leads to the next section of the literature that focuses on treatment of depression in individuals who have been diagnosed with heart disease (Rieckmann, et al., 2006).

Treating Depression Co-occurring with Coronary Heart Disease

Most research that is conducted on interventions for coronary heart disease (CHD) focuses primarily on physiological risk factors such as smoking, weight, and alcohol use. However, research continues to grow on ways that heart disease is linked to negative psychological factors as well. In a brief review of psychological interventions, Peterson and Kim (2011) identified several studies that were

conducted to determine the efficacy of different types of psychological interventions with individuals who had CHD. The Ischemic Heart Disease Study (Frasure-Smith & Prince, 1985) used a home-based stress reduction model and reported this model reduced stress and cardiac deaths by nearly 50%. Another study, The Recurrent Coronary Prevention Project (Friedman, et al., 1986), used a group therapy format focusing on behavioral therapy and making behavioral changes. This allowed individuals who struggle with Type A behaviors and negative affect to reduce mortality and the occurrence of non-fatal heart attacks. The Montreal Heart Attack Readjustment Trial (M-HART) (Frasure-Smith et al., 1997) and the Canadian Cardiac Randomized Evaluation of Antidepressant and Psychotherapy Efficacy (CREATE) (Jones & West, 1996) studies found no reliable changes when using interpersonal psychotherapy and clinical management, and found that depression medications (specifically selective serotonin reuptake inhibitors, or SSRI's) were effective. Interpersonal psychotherapy combined with clinical management seemed to work as well as basic clinical disease management alone, suggesting the addition of interpersonal psychotherapy rendered no additional changes to individuals with depression.

The Enhanced Recovery in Coronary Heart Disease Patients (ENRICHD) (ENRICHD Investigators, 2003) study looked at individuals who had previously had a heart attack and have depression and/or a low perceived social support system. In this study people were divided into a treatment group or a usual care group. The treatment group used cognitive behavioral therapy in a group format to

address the depression and/or the perceived lack of social support. In cases of more severe depression, individuals were given group therapy as well as a selective serotonin reuptake inhibitor. Follow-up analyses revealed no differences in terms of nonfatal heart attack, all-cause death, or cardiac death between treatment and usual care groups. It was later revealed that usual treatment providers were offering psychological therapies and cardiac rehabilitation programs, which the researchers hypothesized may have reduced the differences between the treatment group and usual care groups. Additionally, the researchers admitted they informed the participants they were placed in the treatment group due to psychological symptoms or lack of social support, which may have prompted the participants to seek outside psychological services. A follow-up study to the ENRICHD program found individuals who received individual therapy plus group therapy were at a 33% reduced risk of all-cause mortality and nonfatal heart attack compared to those who received only usual care (Peterson & Kim, 2011).

Peterson and Kim (2011) also identified The Stockholm Women's Intervention Trial for Coronary Heart Disease (Orth-Gomer et al., 2009), which took a sample of women with CHD and randomly placed them in either group-based psychological treatment or usual cardiac care group. Each psychological group had between four and eight women who met 20 times over the course of one year. At the one-year follow-up, the women in the treatment group had healthier levels of inflammatory markers, and at a seven-year follow-up, treatment group members had reduced their risk of mortality three-fold (Peterson & Kim, 2011).

Overall, Peterson and Kim (2011) found that mortality reduction occurred only when overall distress was reduced by the intervention. Additionally, psychological interventions were only useful in reducing mortality when started two months after the initial cardiac event. Starting treatment two months after the initial event reduced the mortality rate by approximately 72%. Psychological treatments that were started immediately following the cardiac event were found to be ineffective. Delaying psychological treatment by two months is likely better because depression following a major cardiac event can be either stable over time, can worsen, or can improve. Starting treatment too soon may not be effective for some people as the depressive symptoms may remit on their own.

Determinants of Cardiac Health and Cardiac Disease

The American Heart Association Strategic Impact Goals through 2020 (Lloyd-Jones et al., 2010) encouraged heart disease researchers to find and examine determinants of cardiac health beyond the absence of clinical disease. This means finding certain assets in an individual's life that contribute to cardiac health. Some suggestions for research of psychological health assets are optimism, positive affect, emotional vitality, life satisfaction, happiness, and a feeling of meaning or purpose in life. These psychological assets strengthen several domains of overall health including health behaviors, biological processes, the likelihood of morbidity, and longevity of life (Peterson & Kim, 2011).

Posttraumatic growth was also looked at in connection with heart disease and the presence of mental health difficulties. Posttraumatic Growth is defined as a

subjective experience of positive psychological change, which is generally reported by individuals who have successfully coped with trauma or challenging life experiences. Posttraumatic growth was explored in survivors of heart disease and was found to be associated with adaptive cognitive coping, ample social support, and extraversion. Additionally, posttraumatic growth was negatively associated with depression, suggesting the fewer posttraumatic growth skills and supports a person has, the more likely they are to have depressive symptoms. However, some research suggests that posttraumatic growth can co-exist with psychological distress, which alludes to mental illness and mental health being different conceptual models (Bluvstein, Moravick, Sheps, Schrieber, & Bloch, 2013).

Bluvstein et al. (2013) explored the relationship between posttraumatic stress disorder and posttraumatic growth within individuals who had a heart attack for the first time and acute coronary artery bypass grafting (CAB) six months or more after the first heart attack and CAB. The findings in the research sample were consistent with reports of posttraumatic stress disorder symptoms among individuals with CHD (17.1%) but were inconsistent with reports of posttraumatic growth levels in individuals with chronic illness and in heart disease survivor samples. Subjects in Bluvstein et al.'s (2013) sample had a mean posttraumatic growth score of 41.3. However, Cordova, Cunningham, Carlson, and Andrykowski (2001) found posttraumatic growth scores among women with breast cancer within five years of diagnosis ranged from 57.9 to 64.1, and Leung et al. (2010) found

posttraumatic growth levels to range from 50.3 to 58.3 in cardiac samples. The researchers suggest a reason for the lower posttraumatic growth levels was due to the amount of time that had passed between the assessment and the cardiac event, which was about six months. Similar to Peterson & Kim's (2011) study regarding psychological intervention following a cardiac event, giving time for the individual to process and begin gaining coping skills on their own and testing for posttraumatic growth later may bring about more desirable results.

Bluvstein et al.'s (2013) study also explored the presence of posttraumatic growth as a moderating factor between stress and mental health outcomes. The findings suggest posttraumatic growth acted as a protective factor - higher posttraumatic growth scores indicate a lower likelihood of distress caused by posttraumatic stress symptoms and overall psychological difficulties. Additionally, lower posttraumatic growth scores suggest lowered psychological well-being and lower mental health related quality of life.

Gender and Coronary Heart Disease

Women and men present different risk factors for heart disease. For example, diabetes is likely a stronger risk factor for heart attacks in women than it is in men (Mercuro, Zoncu, & Dragoni, 2003). Women who are diagnosed with heart disease have a poorer prognosis than men (Watanabe, Maynard, & Ritchie, 2001). The presentation of heart attack symptoms in women differ from men; symptoms found in women are typically nausea, back pain, and shortness of breath (Gidron, Levy, & Cwikel, 2007), while men typically experience chest pain,

sweating, and hiccups (Chen, Woods, & Puntillo, 2005). A study by Gidron et al.

(2007) focused on identifying psychosocial factors that affect inflammatory disease,

such as rheumatoid arthritis or urinary infections, in women, and found

comparisons of factors between sexes. The first factor explored was hostility, and

hostility was found to be correlated with self-reported hostility in men and

neuroticism in women (Davidson & Hall, 1995), and hostility was shown to predict

coronary heart disease in women (Barefoot, Larsen, von der Leith, & Schroll,

1995). Additionally, restraining anger may be a risk factor of coronary heart disease

in women (Lahad, Heckbert, Koepsell, Psaty, & Patrick, 1997), and low self-

esteem, which has received minimal attention in research, may be a strong indicator

of lower quality of life scores in women following a heart attack (Wingate, 1995),

and low self-esteem (Keith & Schafer, 1982), along with hopelessness

(Abrahamson, Metalsky, & Alloy, 1989), may be risk factors for developing

depression. Gidron et al.'s (2007) study identified low self-esteem as raising the

likelihood of heart disease in women by eight-fold compared to those without low

self-esteem, but were unable to determine if low self-esteem was due to the heart

disease or present prior to the heart disease.

Gidron et al.'s (2007) study also found that, when controlling for depression,

(as previously thought, depression may be a mediating factor between heart disease

and low self-esteem), there was still a significant correlation between heart disease

and low self-esteem in women. Among women who indicated they were

participating in a cardiovascular prevention program, low self-esteem was

identified as being a barrier to making lifestyle changes, and self-esteem was ranked as a more important factor for women than for men (Mosca, McGillen, & Rubenfire, 1998). This suggests that low self-esteem may inhibit motivation to making lifestyle changes or adhering to suggested healthy behaviors for preventing coronary heart disease, and also may play a role in poor prognosis in women who have already been diagnosed with coronary heart disease.

Additionally, Plach and Heidrich (2002) found depression in women who had undergone heart surgery was related to concerns about their social roles and the way women perceive their ability to meet the standards they set for themselves in those roles. This finding, along with Larsen, Vickers, Sampson, Netzel, and Hayes' (2006) findings, suggest depression in women was tied to aspects of their social roles and whether the women believe they are able to fulfill those roles adequately.

Sanjuan, Ruiz, and Perez (2011) explored the relationship between life satisfaction, positive coping, and emotional distress within men diagnosed with coronary heart disease. Using questionnaires and scales to determine anxiety, depression, adjustment, and life satisfaction among approximately 88 men, the researchers determined life satisfaction and positive adjustment played a role in the presence of anxious and depressive symptoms. Men who reported more satisfaction with their lives and experienced more positive coping, reported fewer anxious and depressive symptoms. Further, the researchers concluded that life satisfaction is predictive of whether symptoms of depression are likely to occur in the months following a cardiac event. Men with higher life satisfaction scores had reported less

depressive symptoms, and since life satisfaction tends to be a pervasive feature in a person, it is likely an individual's satisfaction with life can predict the occurrence of depressive symptoms later.

Sanjuan, Ruiz, and Perez (2011) also found that positive coping strategies in men are useful in reducing the emotional impact of a cardiac diagnosis, but positive coping strategies alone are likely not enough by themselves to prevent or lessen the long-term emotional symptoms that occur from the consequences of the disease. The utility of coping strategies is most beneficial when an individual is first diagnosed with a cardiac condition, as many of the emotions stem from uncertainty about future, potential threats to life, and the fear of another cardiac event, all of which are suggestive of anxious feelings. As time progresses, anxious feelings likely change to depressive feelings, such as hopelessness, having to give up on some life goals, and realizing the disease has caused permanent effects on life.

Social Support and Daily Living

Davis and Swan (1999) found that quality of social support as reported by women is a factor in coronary heart disease. The researchers found that "undermining social-ties," which were defined as negative behaviors toward a target individual, such as criticism and intrusiveness, were associated with heightened levels of fibrinogen, an important part of coagulation in thrombosis, which may suggest a link between little social support and coronary heart disease. A study by Lynch (1998) found women tend to prefer that their primary social

support come from their children, while men prefer their primary social support to come from their wives.

Orth-Gomer & Johnson (1987) conducted a study exploring social support and cardiovascular disease in men and women. In a six-year follow-up, the researchers found individuals with the lowest amount of social contacts had a fifty percent increased risk of death due to effects of coronary heart disease than those who had more social contacts. An additional study by Vogt, Mullooly, Ernst, Pope, and Hollis (1992) followed male and female participants for 15 years who were participating in a health-maintenance organization and used hospital records to determine incidence of heart attack. After controlling for risk factors such as hypertension and obesity, the researcher's found that individuals who reported many different types of social support were less likely to experience a heart attack than those who reported less social support.

Pryor, Page, Patsamanis, and Jolly (2012) used qualitative data collected from participants in a cardiac rehabilitation program. The researchers interviewed nine total participants: five women and four men. Not only did most of the participants indicate that surviving a cardiac event significantly impacted their lives, but that the immediate effects to daily routine were surprising. Individuals reported being too tired to properly tend to daily activities, being unable to complete tasks physically, and finding it difficult to psychologically handle being away from work and at home for extended periods of time, which was especially difficult for

individuals who had previously handled more responsibilities, such as working full-time and managing families.

A common theme among the participant's responses in the Pryor et al. (2012) study was that of social support. Many identified the support of family, friends, and their primary care doctor as important factors in navigating through difficult times surrounding their illness. Additionally, having social support was a factor in aiding the participants in adhering to new lifestyle changes, and was of the utmost importance when it came to adjusting to a new way of life. Furthermore, participants expressed a desire to learn ways to make and maintain lifestyle changes and, although support from family, friends, and doctors was useful, a need for ongoing support, such as follow-ups, and reinforcement in various recovery stages was desired.

As stated previously, women tend to have different symptoms during a heart attack than do men, including the absence of chest pain. Along those lines, women also tend to require more hospitalizations because symptoms are more persistent and occasionally vague, which can lead to misdiagnosis (National Institutes of Health, 2007), and women tend to experience lower self-ratings of well-being and are more limited in their ability to perform daily tasks (Olson at al., 2003). Therefore, heart disease in women becomes challenging for care providers due to symptom burden, reduced functionality, increase in healthcare needs, and poorer outcomes compared to male counterparts (Shaw, Bugiardini, & Merz, 2009). Knowing women have more difficulty with the symptoms of heart disease,

returning to work and daily activities becomes more burdensome and lengthier than for men. In a study by LaCharity (1999), 11 women were qualitatively interviewed who had been diagnosed with coronary heart disease. A common concern among the participants was their ability to return to work and family roles. While returning to work may not be as important to men as it is women (Kristofferzon, Lofmark, & Carlsson, 2003), women who do return to work tend to return approximately four months following a heart attack, even though women tend to encounter less functional ability at that time (Riegel & Gocka, 1995). This information is important for practitioners to have when management plans are negotiated or recommendations are made to women who hold employment are made to reduce the risk of another cardiac event.

Overall, social support is an important factor in recovery following a cardiac event, including the diagnosis of CHD. A lack of social support can increase the risk of a cardiac event in individuals diagnosed with heart disease and can also be part of the development and maintenance of depressive symptoms, which can lead to an even higher risk of a cardiac event.

Coronary Heart Disease Management Plans

The utility of disease management plans, for chronic disease and for heart disease specifically, has been explored in Australia and Canada. Australian findings indicate disease management plans that addressed lifestyle changes and medication interventions were beneficial to individuals living with heart disease. However,

where management of heart disease falls short is with the application of those interventions in clinical settings (Bhatt et al., 2006).

Chew, Carter, Rankin, Boyden, and Egan (2010) proposed a "General Practice-Based Coronary Heart Disease Initiative," in which heart disease patients would follow a cycle of practitioner assessment and recommendations to assist with maintaining lifestyle changes. As a means of getting practitioners involved, a proposal was included for reimbursement for the consultations, but also to include an additional financial incentive to encourage practitioners to be part of the initiative.

Chew et al., (2010) determined improved patient care and management plans for individuals with coronary heart disease could create a 16% reduction of hospital admissions, a 6% reduction of reoccurring heart attacks, and a 9% reduction in mortality, based on information gathered from McAlister, Lawson, Teo, and Armstrong (2001). For their study, as a means of offering a more moderate approximation of improvement, the researchers assumed 15% overall reduction of disability adjusted life years, premature deaths, and hospital readmissions. Cost was estimated by considering financial incentives to facilitate practitioners and rewards, payment for consultations, and effects of healthcare on improved quality of care. The researchers concluded that, depending on the percentage of individuals diagnosed with coronary heart disease who had access to the program, and assuming the program ran as it was intended to and to its full potential, disability adjusted life years could decrease anywhere from 7,500 (at

21% reduction) to 25,000 (at 65% reduction). According to Chew et al. (2010),

while the cost to implement the program is high (approximately AU$115 million),

implementing such management plans would likely prove to be far more cost

effective than other interventions.

Arthur et al. (2010) explored chronic disease management using the chronic

care model worldwide to offer recommendations for Canada's treatment of

cardiovascular disease and cardiac rehabilitation as it pertains to the country's

Canadian Heart Health Strategy and Action Plan. The chronic care model

incorporates six main elements: the health care system, delivery system design,

decision support, clinical information systems, self-management support, and the

community. Within this model, cardiac rehabilitation falls within different parts of

the chronic care model, including specialists, physicians, and family. While the

authors identified multiple cardiac rehabilitation plans in other countries, the

conclusion was that little evidence existed regarding the implementation of the

strategies or direct outcomes of the plan implementation. Even though cardiac

rehabilitation programs are widely in favor, they are only used 20-30% of the time

in North America and Europe (Suskin, Arthur, Swabey, & Ross, 2002; Kostev,

Wood, De Bacquer, Heidrich, & De Backer, 2004).

Arthur et al. (2009) recommended the Canadian Heart Health Strategy and

Action Plan include the factors of the chronic care model to enhance cardiac

rehabilitation. The recommendation included recognizing the importance of cardiac

rehabilitation and initiating rehabilitation as soon as possible (health systems);

providing care in places the patients reside (family), incorporating case

management, especially in more complex cases, and being flexible with delivery

and location of services to meet the needs of the patient (delivery system design).

Clinical care should incorporate best evidence and patient preference, and team

members should be educated in up-to-date clinical care information (decision

support). Electronic medical records, care algorithms, and resources centers should

be utilized and monitored (clinical information systems); information should be

provided to the family and patient and should be centered around the needs of the

patient, and patients should be engaged in their health care (self-management

support). Lastly, including the public in promoting shifts in the type of cardiac

rehabilitation system would be most useful, with workplaces and third-party

insurers becoming more active in cardiovascular health (community). While this

care model would be beneficial for addressing the physiological effects and risk

factors of cardiovascular disease, the study does not identify psychosocial or

psychological risk factors, and barely scratches the surface of social support by

including family members in the treatment of cardiovascular disease.

The California Heart Disease and Stroke Prevention and Treatment Task

Force (Nuno, 2007) released a master plan to combat heart disease and stroke in the

state. The master plan includes nine distinct goals for the state to treat and prevent

heart disease and stroke, including acute management, chronic disease management,

public education, healthcare professional education, legislation and policy, priority

populations, research, and monitoring. The 176-page document includes

explanations of each of the 9 goals, time-sensitive strategies for communities, school, workplaces, and healthcare systems, and potential partners within each goal. While the document is extensive and informational, and outlines a detailed plan to lessen the burden of heart disease and stroke, mental health interventions remain absent, save for the inclusion of patient education on the effects of mental health difficulties on heart disease risk.

The research surrounding the connection between depression and heart disease is vast, and connections have been made between mental health difficulties, social support, and the risk of continued cardiovascular difficulties, including heart attack. The literature recognizes the importance of this connection, but much of the research reports lack suggestions and recommendations on how to address these factors in patients who suffer from mental health difficulties as well as heart disease. This current study will further explore the connection between mental health and cardiovascular disease and recommend ways in which mental health issues can be addressed in individuals who suffer from cardiovascular diseases.

Study Hypotheses

Not only does this study aim to bolster the current data on depression and heart disease, but it also aims to answer additional questions that may be useful to implement in healthcare settings with cardiac patients. Additionally, this study hopes to encourage the inclusion of psychological services in chronic illness management plans.

Hypothesis 1: Depression will be significant within individuals diagnosed with heart disease compared to those without heart disease, which would be congruent with the current literature.

Hypothesis 2: Feelings of hopelessness and worthlessness, both found within depression, will be significant in individuals with heart disease compared to those without heart disease.

Hypothesis 3: A diagnosis of heart disease will have an effect on the individual's social relationships, work performance, and ability to maintain the home compared to individuals without heart disease.

Hypothesis 4: Individuals who were given management plans for their heart disease diagnosis will have fewer mental health difficulties, less social distress, and less interference with work and home requirements than those without management plans.

Method

Participants

Participants in this study include individuals who successfully completed the California Health Interview Survey during the 2013 – 2014 interview periods. In 2013, the total number of adult participants who completed the interview was 20,724. In 2014, the total number of adult participants who completed the interview was 19,516. The total number of adult participants over the span of two years was 40,240.

Materials and Procedure

The data used in this study were collected by the University of California,

Los Angeles (UCLA, 2012) through the California Health Interview Survey (CHIS).

UCLA (2012) describes the CHIS as:

> The largest state health survey in the nation. It is a random-dial telephone
>
> survey that asks questions on a wide range of health topics. CHIS is
>
> conducted on a continuous basis allowing the survey to generate timely one-
>
> year estimates. CHIS provides representative data on all 58 counties in
>
> California and provides a detailed picture of the health and health care
>
> needs of California's large and diverse population (About CHIS section,
>
> para. 2).

The CHIS covers various health-related topics, such as health conditions, behaviors,

disabilities, sexual health, health insurance, and mental health, and includes an

array of demographic information (UCLA, 2012).

The hypotheses of this current study were addressed using 13 questions

from the 2013 – 2014 CHIS. A list of the specific questions, as well as the

Institutional Review Board Application, can be viewed in Appendix A. The

participants answered using a one to seven Likert-type scale provided to them by

CHIS. For this study, answers falling within "Refused" and "Don't Know" were

omitted from analyses. The items were scored using the following method: 1 = All

of the time, 2 = Most of the time, 3 = Some of the time, 4 = A little of the time, and

5 = Not at all. Additionally, responses to questions QA13_B37 "Has a doctor ever

told you that you have any kind of heart disease?" and QA13_B42 "Have your

doctors or other medical providers worked with you to develop a plan so that you

know how to take care of your heart disease?" were both answered using 1 = Yes

and 2 = No, which were included in this analysis. Analyses were conducted on each

year's data set separately for this study due to having two separate data sets.

However, this may have acted as a limitation of the study, and will be further

explained in the limitations section.

Results

Sample Demographics

CHIS collected demographic information from each participant in the study.

The results are summarized in Appendix B (Tables 1 and 2). Of the 20,724

participants in the 2013 sample, 41.2% were male and 58.8% were female; 17.4%

were between the ages of 18 and 39 years, 32.7% between the ages of 40 and 59

years, 44.7% between the ages of 60 and 84 years, and 5.2% 85 years or older;

76.8% were Caucasian, 5.6% African American, 20.3% Hispanic/Latino, 10.5%

Asian/Other Asian Group, and 18.4% reported Other ethnicity; 39.6% reported

holding full-time (21 or more hours per week) employment, 7.9% part-time

employment, .4% other employment, 4.8% unemployment but looking for work,

and 47.4% reported unemployed and not looking for work.

Of the 19,516 participants in the 2014 sample, 40.4% were male and 59.6%

were female; 15% were between the ages of 18 and 39 years, 30.9% between the

ages of 40 and 59 years, 48.1% between the ages of 60 and 84 years, and 6% were

85 years or older; 75.3% were Caucasian, 4.7% African American, 19.4% Hispanic/Latino, 16.2% Asian/Other Asian Group, and 20.7% reported Other ethnicity; 37% reported holding full-time (21 or more hours per week) employment, 7.8% part-time employment, .3% other employment, 3.8% unemployment but looking for work, and 51% reported unemployed and not looking for work.

Mental Health and Heart Disease

Independent samples t-tests were performed comparing scores between individuals diagnosed with heart disease to those without the diagnosis on multiple survey items in the 2013 and 2014 data sets (see Tables 3 and 4).

Hypothesis 1: Depression will be significant within individuals diagnosed with heart disease compared to those without heart disease, which would be congruent with the current literature.

Within the 2013 data set, on the survey item *QA13_F4 How often did you feel so depressed that nothing could cheer you up (last 30 days)?,* which asks participants to rate their feelings of depression in the last 30 days on a 1 (all the time) to 5 (not at all) scale, individuals diagnosed with heart disease ($M = 4.68$, $SD = .74$, $N = 2,193$) reported feeling depressed more than those without a heart disease diagnosis ($M = 4.74$, $SD = .67$, $N = 18,397$, $t(2636.25) = -3.31$, $p < .05$. On the survey item *QA13_F5 During the past 30 days, about how often did you feel that everything was an effort?,* using a 1 (all the time) to 5 (not at all) scale, individuals diagnosed with heart disease ($M = 4.16$, $SD = 1.13$, $N = 2193$) reported feeling more effort was needed to complete daily tasks than those without a heart

disease diagnosis (*M* = 4.30, *SD* = 1.06, *N* = 18,397), *t*(2669.2) = -5.37, *p*

< .05.On the survey item *QA13_F12 (one month in the past 12 months you were at*

your worst emotionally) How often did you feel that everything was an effort?,

which asks participants to rate their emotions during the worst month in the last 12

months on a 1 (all the time) to 5 (not at all) scale, individuals diagnosed with heart

disease (*M* = 2.92, *SD* = 1.25, *N* = 372) reported feeling more effort was needed to

complete daily tasks than those without a heart disease diagnosis (*M* = 3.13, *SD* =

1.27, *N* = 3,440), *t*(3810) = -3.07, *p* < .05.

Within the 2014 data set, on the survey item *QA13_F4 How often did you*

feel so depressed that nothing could cheer you up (last 30 days)?, which asks the

participant how often he or she has felt depressed in the last month, individuals

diagnosed with heart disease (*M* = 4.66, *SD* = .79, *N* = 2,246) reported feeling

depressed more often than those without a heart disease diagnosis (*M* = 4.74, *SD*

= .67, *N* = 17,156), *t*(2692.16) = 4.5, *p* < .05. On the survey item *QA13_F5 During*

the past 30 days, about how often did you feel that everything was an effort?, which

asks the participants how often he or she felt daily tasks were worth an effort,

individuals diagnosed with heart disease (*M* = 4.13, *SD* = 1.16, *N* = 2,246) reported

feeling everything is an effort more than those without a heart disease diagnosis (*M*

= 4.33, *SD* = 1.05, *N* = 17,156), *t*(2748.05) = 7.98, *p* < .05. This suggests

individuals who have a heart disease diagnosis found daily tasks to require more

effort in the last month than those without heart disease. On the survey item

QA13_F12 (one month in the past 12 months you were at your worst emotionally)

How often did you feel that everything was an effort?, individuals diagnosed with heart disease ($M = 3.01$, $SD = 1.27$, $N = 395$) reported feeling everything is an effort more than those without a heart disease diagnosis ($M = 3.14$, $SD = 1.26$, $N = 2,958$), $t(3351) = 1.98$, $p < .05$. This suggests individuals diagnosed with heart disease experienced more difficulty with daily tasks during their worst month emotionally in the last 12 months than those without heart disease.

Hypothesis 2: Feelings of hopelessness and worthlessness, both found within depression, will be significant in individuals with heart disease compared to those without heart disease.

Within the 2013 data set, on the survey *item QA13_F2 During the past 30 days, about how often did you feel hopeless?*, which asks participants to rate their feelings of hopelessness in the last 30 days on a 1 (all the time) to 5 (not at all) scale, individuals diagnosed with heart disease ($M = 4.61$, $SD = .80$, $N = 2,193$) reported feeling more hopeless in the last 30 days than people without heart disease ($M = 4.66$, $SD = .72$, $N = 18,397$), $t(2633.43) = -3.12$, $p < .05$. On the survey item *QA13_F6 During the past 30 days, how often did you feel worthless?,* which asks participants to rate their feelings of worthlessness in the last 30 days on a 1 (all the time) to 5 (not at all) scale, individuals diagnosed with heart disease ($M = 4.68$, $SD = .81$, $N = 2,193$) reported feeling worthless more than those without a heart disease diagnosis ($M = 4.77$, $SD = .65$, $N = 18,397$), $t(2545.85) = -5.44$, $p < .05$.

Within the 2014 data set, on the survey item *QA13_F2 During the past 30 days, about how often did you feel hopeless?,* which asks the participant how often

in the last 30 days the participant has felt hopeless, individuals diagnosed with heart disease ($M = 4.61$, $SD = .80$, $N = 2,246$) reported feeling hopeless more than those without a heart disease diagnosis ($M = 4.68$, $SD = .71$, $N = 17,156$), $t(2722.37) = 4.1$, $p < .05$. This finding suggests individuals with heart disease experience more feelings of hopelessness than those without heart disease. On the survey item *QA13_F6 During the past 30 days, how often did you feel worthless?,* which asks the participant how often in the last 30 days the participant has felt worthless, individuals diagnosed with heart disease ($M = 4.65$, $SD = .84$, $N = 2,246$) reported feeling worthless more than those without a heart disease diagnosis ($M = 4.77$, $SD = .67$, $N = 17,156$), $t(2721.31) = 3.15$, $p < .05$.

Hypothesis 3: A diagnosis of heart disease will have an effect on the individual's social relationships, work performance, and ability to maintain the home compared to individuals without heart disease.

Within the 2013 data set, on the survey item *QA13_F15 (one month in the past 12 months you were at your worst emotionally) Did your emotions interfere a lot, some, or not at all with your household chores?,* which asks individuals to rate if their emotions interfered with their ability to complete chores during the worst month in the last 12 months on a 1 (a lot) to 3 (not at all) scale, individuals diagnosed with heart disease ($M = 1.72$, $SD = .75$, $N = 313$) reported their emotions interfered with their ability to complete chores during their worst month in the last 12 months than those without a heart disease diagnosis ($M = 1.82$, $SD = .75$, $N = 2,508$), $t(2819) = -2.17$, $p < .05$.

Interestingly, on two survey items, individuals who did not have a diagnosis of heart disease reported more distress in the areas of emotions interfering with work and emotions interfering with relationships. On the survey item *QA13_F14 (one month in the past 12 months you were at your worst emotionally) Did your emotions interfere a lot, some, or not at all with your performance at work?,* which asks individuals to rate how much their emotions interfered with employment during the worst month in the last 12 months on a scale of 1 (a lot) to 4 (do not work), individuals who did not have a heart disease diagnosis ($M = 2.68$, $SD = 1.15$, $N = 2,297$) reported their emotions interfered with work more often than individuals with a heart disease diagnosis ($M = 3.13$, $SD = 1.17$, $N = 210$), $t(2487) = 5.42$, $p < .05$. On the survey item *QA13_F17 Did your emotions interfere a lot, some, or not at all with your relationship with friends and family?,* individuals who did not have a heart disease diagnosis ($M = 1.84$, $SD = .71$, $N = 2,508$) reported their emotions interfered with relationships more often than individuals with a heart disease diagnosis ($M = 1.93$, $SD = .73$, $N = 313$), $t(2819) = 2.02$, $p < .05$.

There were no significant results in the 2014 dataset in terms of social relationships, work performance, or ability to maintain the home.

Mental Health and Heart Disease Management Plans

Independent samples t-tests were performed comparing scores between individuals diagnosed with heart disease whose medical provider developed a heart disease management plan and those with heart disease whose medical provider did

not develop a heart disease management plan on multiple survey items in the 2013 and 2014 data sets (see Tables 5 and 6).

Hypothesis 4: Individuals who were given management plans for their heart disease diagnosis will have fewer mental health difficulties, less social distress, and less interference with work and home requirements than those without management plans.

Within the 2013 data set, on the item *QA13_F2 During the past 30 days, about how often did you feel hopeless?,* individuals who did not have management plans ($M = 4.46$, $SD = .84$, $N = 559$) reported more feelings of hopelessness than those who had management plans ($M = 4.66$, $SD = .75$, $N = 1,634$), $t(834.48) = 4.63$, $p < .05$. On the item *QA13_F4 How often did you feel so depressed that nothing could cheer you up (last 30 days)?,* individuals who did not have management plans ($M = 4.57$, $SD = .84$, $N = 559$) reported feeling more depressed than those who had management plans ($M = 4.72$, $SD = .70$, $N = 1,634$), $t(836.54) = 3.84$, $p < .05$. On the item *QA13_F5 During the past 30 days, about how often did you feel that everything was an effort?,* individuals who did not have management plans ($M = 4.07$, $SD = 1.20$, $N = 559$) reported daily tasks required more effort than those who had management plans ($M = 4.19$, $SD = 1.11$, $N = 1,634$), $t(901.34) = 2.02$, $p < .05$. On the item *QA13_F6 During the past 30 days, how often did you feel worthless?,* individuals who did not have management plans ($M = 4.56$, $SD = .92$, $N = 559$) reported feeling more worthless than those who had management plans ($M = 4.72$, $SD = .76$, $N = 1,634$), $t(832.34) = 3.57$, $p < .05$.

Within the 2014 data set, on the item *QA13_F2 During the past 30 days, about how often did you feel hopeless?,* individuals who did not have management plans ($M = 4.38$, $SD = .99$, $N = 528$) reported more feelings of hopelessness than those who had management plans ($M = 4.68$, $SD = .72$, $N = 1,718$), $t(705.45) = 6.36$, $p < .05$. On the item *QA13_F13 (one month in the past 12 months you were at your worst emotionally) During that same month, how often did you feel worthless?,* individuals who did not have management plans ($M = 3.24$, $SD = 1.32$, $N = 115$) reported more feelings of hopelessness than those who had management plans ($M = 3.67$, $SD = 1.28$, $N = 280$), $t(393) = 2.99$, $p < .05$. On the item *QA13_F4 How often did you feel so depressed that nothing could cheer you up (last 30 days)?,* individuals who did not have management plans ($M = 4.47$, $SD = .95$, $N = 528$) reported feeling more depressed than those who had management plans ($M = 4.72$, $SD = .72$, $N = 1,718$), $t(720.19) = 5.66$, $p < .05$. On the item *QA13_F11 (one month in the past 12 months you were at your worst emotionally) During that same month, how often did you feel so depressed that nothing could cheer you up?,* individuals who did not have management plans ($M = 3.47$, $SD = 1.22$, $N = 115$) reported feeling more depressed than those who had management plans ($M = 3.83$, $SD = 1.25$, $N = 280$), $t(393) = 2.61$, $p < .05$. On the item *QA13_F5 During the past 30 days, about how often did you feel that everything was an effort?,* individuals who did not have management plans ($M = 3.93$, $SD = 1.26$, $N = 528$) reported daily tasks requiring more effort than those who had management plans ($M = 4.19$, $SD = 1.12$, $N = 1,718$), $t(800.64) = 4.31$, $p < .05$. On the item *QA13_F6 During the past 30*

days, how often did you feel worthless?, individuals who did not have

management plans ($M = 4.44$, $SD = 1.06$, $N = 528$) reported feeling more worthless

than those who had management plans ($M = 4.72$, $SD = .75$, $N = 1,718$), $t(697.65) =$

5.71, $p < .05$. On the item *QA13_F13 (one month in the past 12 months you were at*

your worst emotionally) During that same month, how often did you feel worthless?,

individuals who did not have management plans ($M = 3.45$, $SD = 1.42$, $N = 115$)

reported feeling worthless more often than those who had management plans ($M =$

4.07, $SD = 1.25$, $N = 280$), $t(189.99) = 4.05$, $p < .05$.

Independent samples t-tests were performed comparing scores between

individuals diagnosed with heart disease whose medical provider developed a heart

disease management plan and who had a written copy of the plan in their

possession and those with heart disease whose medical provider developed a heart

disease management plan but did not have a written copy of the plan in their

possession on multiple survey items in the 2013 and 2014 data sets. While both the

2013 and 2014 datasets utilized the same questions, significant t-test results were

only obtained in the 2013 dataset (see Table 7).

On the item *QA13_F4 How often did you feel so depressed that nothing*

could cheer you up (last 30 days)?, individuals who had written copies of their

management plans ($M = 4.65$, $SD = .81$, $N = 539$) reported feeling more depressed

than those who did not have written copies of their management plans ($M = 4.76$,

$SD = .64$, $N = 1,095$), $t(882.93) = -2.76$, $p < .05$. On the *item QA13_F13 (one*

month in the past 12 months you were at your worst emotionally) During that same

month, how often did you feel worthless?, individuals who had written copies of

their management plans (*M* = 3.64, *SD* = 1.41, *N* = 107) reported feeling worthless

more often than those who did not have written copies of their management plans

(*M* = 3.99, *SD* = 1.33, *N* = 160), *t*(265) = -2.11, *p* < .05. Lastly, on the item

QA13_F17 Did your emotions interfere a lot, some, or not at all with your

relationship with friends and family?, individuals who had written copies of their

management plans (*M* = 1.83, *SD* = .73, *N* = 80) reported feeling their emotions

interfered with relationships more than those who did not have written copies of

their management plans (*M* = 2.03, *SD* = .73, *N* = 132), *t*(210) = -1.99, *p* < .05.

Discussion and Implications

Extensive research has been conducted on heart disease and psychological

distress, and the connection between the two is evident in many studies. While the

purpose of this study was to further explore the relationship between heart disease

and psychological distress, it was also aimed to elaborate on the importance of

managing the chronic illness and the psychological distress together to improve

overall health. The decision to include a comparison between psychological distress

in individuals with heart disease and whether or not the individual was given a

management plan for their chronic illness was an important aspect of this study, as

it aimed to identify if psychological distress was experienced less often, or less

severely, when an individual has a disease management plan.

The results of this study were interesting, and occasionally unexpected. As

expected, individuals diagnosed with heart disease reported more psychological

distress than did those without heart disease. Specifically, individuals with heart disease reported increased feelings of hopelessness, worthlessness, and overall depression within the last 30 days of the survey, and individuals with heart disease reported daily tasks were more of an effort within the last 30 days of the survey. Additionally, individuals with heart disease reported their emotions interfered with their ability to complete household chores more than individual's without heart disease.

On two particular items, individuals without heart disease reported more distress than those with heart disease. Those two items looked at emotions interfering with work and with relationships. Individuals who do not have heart disease reported their emotions interfered with work and relationships more than those with heart disease. While this is an interesting finding, it may be explained by several factors. Individuals with heart disease or other chronic illnesses may not work, or work only part time, limiting the effect their emotions have on their employment. Additionally, individuals with heart disease tend to get the disease at an older age when relationships have already formed and stabilized, whereas younger individuals without the disease may still be in the process of forming their relationships.

Another important component of this study was an attempt to determine the usefulness of disease management plans on the psychological well-being of individuals with heart disease. Findings from various t-tests suggest individuals who have management plans created for them tend to experience less psychological

distress than do those without management plans. Specifically, individuals without management plans reported increased feelings of hopelessness, worthlessness, and overall depression than those with management plans, and reported feeling as though daily tasks were an effort more than those with management plans.

The effect of having a copy of the management plan on psychological well-being was also explored in this study. Individuals who indicated they had management plans were also asked if they had a written copy of the management plan. Surprisingly, individuals who did have a copy of their management plans reported increased feelings of worthlessness and overall depression than those who did not have a copy of their management plan. Additionally, individuals who held copies of their management plans reported their emotions interfered with their relationships more than those without a copy of their plan. It could be speculated that having a copy of the management plan could put extra stress on the individual, in that it is a reminder of their illness and a reminder of the limitations they may have in life. Individuals who have a plan but no copy may feel more relief knowing their physicians and other medical professionals are managing their care.

Limitations

Some limitations were present in this study. One limitation was the data stem from only one part of the country, California, and may not be representative of the whole nation. Second, the data are limited to just the questions provided and offer minimal opportunity to explore aspects of mental health other than the basic

questions asked in the CHIS survey. Another limitation is the simplicity of the answers, in that the answers do not allow the researcher to explore the timeline of the development of the disorder and the mental health difficulties. Additionally, the data sets were analyzed separately by year, but combining them may have led to stronger results. This leads to some areas of interest for future studies.

Suggestions for Further Research

Future studies may benefit from exploring the etiology of heart disease and mental health difficulties. It would be interesting to determine which came first, the heart disease or the mental health difficulties. This would involve questions aimed at determining the times in which the symptoms of both started to see if one preceded the other and attempt to make a connection between the two in terms of potential causation.

More research on mental health and chronic illness can assist medical staff and psychologists to better treat the chronic illness as well as the psychological impact the illness has on an individual. While this study has shown that having a management plan is important in reducing the psychological effects, it is strongly suggested that management plans include a mental health aspect, either by recommending individual therapy, a psychology or psychiatry consult, or screening for mental health concerns during follow-ups to ensure the mental health of individuals with chronic illness is adequately addressed. This would include collaboration by mental health professionals with cardiac specialists and primary care physicians. Additionally, as social relationships have been connected to

cardiac events, in that individuals with less social support have a higher risk of another event, it might be beneficial to collaborate with social workers who can assist with connecting the cardiac client with community resources and acting as additional social support.

Additionally, because psychosical risk factors differ between men and women, further research should include treatments specific to men and women based on the findings of research specified in the literature. Specific to women, an increase in risk for additional cardiac events occurs when women experience more emotional distress, such as restraining anger, low self-esteem, hostility, and hopelessness. However, men tend to have higher risk of additional cardiac events when they are unsatisfied with their overall life and are lacking in positive coping strategies. Therefore, it may be beneficial to consider research regarding the efficacy of emotional regulation therapy for women and coping and life satisfaction improvement for men.

To better address the efficacy of mental health treatment on depression following a cardiac event, following the suggestion of Peterson and Kim (2011), withholding mental health treatment for two months may be beneficial in determining appropriate treatment modalities for mental health difficulties. This is because symptoms of depression may reduce naturally in that time, and two months is adequate time to determine if diagnostic criteria is met to better determine treatment of mental health disorders. Some studies mentioned earlier, such as the Ischemic Heart Disease Study (Frasure-Smith & Prince, 1985), The Recurrent

Coronary Prevention Project (Friedman et al., 1986), the Montreal Heart Attack

Readjustment Trial (Frasure-Smith et al., 1997), and the Canadian Randomized

Evaluation of Antidepressant and Psychotherapy study could be re-evaluated and

reformed to take into account the new information regarding treatment of

depression and other mental health difficulties in heart disease. Additionally, other

future studies may benefit from including other treatment modalities, such as

cognitive-behavioral models or existential-humanistic models, to alleviate

psychological distress as a result of, or that may have been exacerbated by, a

cardiac event.

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Appendix A

California Health Interview Survey (CHIS) list of questions used in analyses:

1. QA13_B37 Has a doctor ever told you that you have any kind of heart disease?

2. QA13_B42 Have your doctors or other medical providers worked with you to develop a plan so that you know how to take care of your heart disease?

3. QA13_B43 Do you have a written or printed copy of this plan?

4. QA13_F4 How often did you feel so depressed that nothing could cheer you up (last 30 days)?

5. QA13_F5 During the past 30 days, about how often did you feel that everything was an effort?

6. QA13_F2 During the past 30 days, about how often did you feel hopeless?

7. QA13_F6 During the past 30 days, how often did you feel worthless?

8. QA13_F11 (one month in the past 12 months you were at your worst emotionally) During that same month, how often did you feel so depressed that nothing could cheer you up?

9. QA13_F9 (one month in the past 12 months you were at your worst emotionally) During that same month, how often did you feel hopeless?

10. QA13_F12 (one month in the past 12 months you were at your worst emotionally) How often did you feel that everything was an effort?

11. QA13_F13 (one month in the past 12 months you were at your worst emotionally) During that same month, how often did you feel worthless?

12. QA13_F14 (one month in the past 12 months you were at your worst emotionally) Did your emotions interfere a lot, some, or not at all with your performance at work?

13. QA13_F15 (one month in the past 12 months you were at your worst emotionally) Did your emotions interfere a lot, some, or not at all with your household chores?

14. QA13_F16 (one month in the past 12 months you were at your worst emotionally) Did your emotions interfere a lot, some, or not at all with your social life?

15. QA13_F17 Did your emotions interfere a lot, some, or not at all with your relationship with friends and family?

Appendix B

Table 1.
Demographic Characteristics of CHIS Participants - 2013

Characteristic	*n*	%
Gender		
Male	8529	41.2
Female	12195	58.8
Age		
18 – 39	3623	17.4
40 – 59	6794	32.7
60 – 84	9234	44.7
85+	1071	5.2
Ethnicity*		
Caucasian	15911	76.8
African American	1161	5.6
Hispanic/Latino	4203	20.3
Asian/Other Asian Group	2178	10.5
Other	3797	18.4
Employment Status		
Full-time	8204	39.6
Part-time	1630	7.9
Other	76	0.4
Unemployed – looking for work	985	4.8
Unemployed – not looking for work	9829	47.4

*Some participants likely claimed more than one race, making the total higher than the *n* of 20,724

Table 2.
Demographic Characteristics of CHIS Participants - 2014

Characteristic	*n*	%
Gender		
Male	7889	40.4
Female	11627	59.6
Age		
18 – 39	2916	15
40 – 59	6033	30.9
60 – 84	9402	48.1
85+	1165	6
Ethnicity*		
Caucasian	14694	75.3
African American	917	4.7
Hispanic/Latino	3793	19.4
Asian/Other Asian Group	3167	16.2
Other	4032	20.7
Employment Status		
Full-time	7217	37
Part-time	1531	7.8
Other	60	0.3
Unemployed – looking for work	748	3.8
Unemployed – not looking for work	9960	51

*Some participants likely claimed more than one race, making the total higher than the *n* of 19,516

Table 3.
Mental Health and Heart Disease t-Tests – 2013

	With Heart Disease		Without Heart Disease		
	M	SD	M	SD	*t*-test
Feel depressed last 30 days	4.68	.74	4.74	.67	-3.31
Feel everything is an effort worst month	2.92	1.25	3.13	1.27	-3.03
feel everything is an effort last 30 days	4.16	1.13	4.30	1.06	-5.37
Feel worthless last 30 days	4.68	.81	4.77	.65	-5.44
Feel hopeless last 30 days	4.61	.80	4.66	.72	-3.12
Emotions interfere with chores worst month	1.72	.75	1.82	.75	-2.17
Emotions interfere with work worst month	3.13	1.17	2.68	1.15	5.42
Emotions interfere with relationships worst month	1.93	.73	1.84	.71	2.02

Table 4.
Mental Health and Heart Disease t-Tests – 2014

	With Heart Disease		Without Heart Disease		
	M	SD	M	SD	*t*-test
Feel depressed last 30 days	4.66	.79	4.74	.67	-4.5
Feel everything is an effort last 30 days	4.13	1.16	4.33	1.05	-7.98
Feel everything is an effort worst month	3.01	1.27	3.14	1.26	-1.98
Feel hopeless last 30 days	4.61	.80	4.68	.71	-4.1
Feel worthless last 30 days	4.65	.84	4.77	.67	-6.31

Table 5.
Mental Health and Heart Disease Management Plans t-Tests – 2013

	Did Not Have Plan		Did Have Plan		
	M	SD	M	SD	*t*-test
Feel hopeless last 30 days	4.46	.91	4.66	.75	4.63
Feel worthless last 30 days	4.56	.92	4.72	.76	3.57
Feel depressed last 30 days	4.57	.84	4.72	.70	3.84
Feel everything is an effort last 30 days	4.07	1.20	4.19	1.11	2.01

Table 6.
Mental Health and Heart Disease Management Plans t-Tests – 2014

| | Did Not Have Plan | | Did Have Plan | | |
	M	SD	M	SD	*t*-test
Feel hopeless last 30 days	4.38	.99	4.68	.72	6.36
Feel hopeless worst month	3.24	1.32	3.67	1.28	2.99
Feel worthless last 30 days	4.44	1.06	4.72	.75	5.71
Feel worthless worst month	3.45	1.42	4.07	1.25	4.05
Feel depressed last 30 days	4.47	.95	4.72	.72	5.66
Feel depressed worst month	3.47	1.22	3.83	1.25	2.61
Feel everything is an effort last 30 days	3.93	1.26	4.19	1.12	4.31

Table 7.

Mental Health and Heart Disease Management Plans – With and Without Copies t-Tests – 2013

	Copy of Plan		No Copy of Plan		
	M	SD	M	SD	*t*-test
Feel depressed last 30 days	4.65	.81	4.76	.64	-2.76
Feel worthless worst month	3.64	1.41	3.99	1.33	-2.11
Emotions interfere with relationships worst month	1.83	.73	2.03	.73	-1.99