SOCIAL SUPPORT, DEPRESSION, AND CARDIOVASCULAR DISEASE IN MARRIED, MIDDLE-AGED/OLDER ADULTS

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This study examined the relationship between physical health, social support, and depression in a married, middle-aged/older adult sample in which at least one partner has heart disease. The data was obtained from a national longitudinal study the Health and Retirement Survey (HRS) and is composed of selected respondents and their spouses. The HRS Wave 1 data that was used for these analyses was collected in 1992 and 1993. This study tested a stress buffer model predicting the relationship between physical health, social support, and depression.

For study inclusion, participants must have been diagnosed with cardiovascular disease and received treatment in the last year. A heart disease construct was developed by calculating the level of disease by the number of conditions and medical treatments received within the last year. A second health category for other chronic health conditions included diabetes, arthritis, cancer, and chronic pain. These constructs were combined into a total disease construct, which provided a broad measure of health problems typical of an older adult population. Social support was determined by respondents' satisfaction with friends, neighbors, family, their marriage, and enjoyable time spent with their spouse. Social support was subdivided into two constructs separating spousal support from social support sources outside the marriage. The Center for Epidemiological Studies Depression short-form (CES-D) calculated depression scores.

Findings support a stress-buffering model among older married adults with chronic diseases. Hierarchical multiple regressions found the following main effects

predicted Depression: Total Disease (Beta=. 03, p<. 000), Exercise (Beta=-.11, p<. 000), Smoking (Beta=. 04, p<. 001), General Support (Beta=-.21, p<. 000), Spousal Support (Beta=-.19, p<. 000). The Total Diseases by Spousal Support interaction was a significant predictor of Depression for men and women (Beta= -.04, p<. 000) and Total Disease by Spousal Support was also a significant predictor for men and women (Beta=-.03, p<. 000). For men with Heart Disease, Total Disease by Spousal Support was a stronger predictor (Beta=-.03) than it was for women with Heart Disease (Beta=-.10). These results may partially explain gender differences in heart disease patients and suggests several psychological interventions that could be beneficial.

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INTRODUCTION

Social Support, Depression and Cardiovascular Disease in Married, Middle-Aged/Older Adults

Cardiovascular disease has been the leading cause of death in the United States since 1930 (Jenkins, 2002). There are more than 450,000 deaths related to cardiovascular disease each year. Over $100 billion dollars is spent in costs each year on medical treatment, disability, and lost wages due to heart disease (Itkowitz, Kerns, & Otis, 2003; Smith & Ruiz, 2002). The impact of cardiovascular disease is widespread effecting occupational, psychological, and social functioning. The diagnosis strongly affects one's quality of life and can cause permanent changes in independent functioning (Shwartzman & Glaus, 2000). The clinical manifestations of the disease will be identified before discussing the impact of cardiovascular disease on physical, social, and psychological functioning.

Cardiovascular disease is composed of three distinct clinical diagnoses of coronary heart disease, valvular heart disease, and cardiomyopathy angina pectoris. Coronary heart disease is the most common diagnosis among people with heart related diagnoses. Coronary heart disease consists of three clinical syndromes; angina pectoris, acute myocardial infarction and ventricular arrhythmia (Uchino, Cappioppo, & Kiecolt-Glaser, 1996). Angina pectoris describes a temporary discomfort in the chest that may follow stress or physical exertion. Acute myocardial infarction, or a heart attack, occurs when the heart is deprived of oxygen and part of the muscle dies. Myocardial infarction places a great stress on the heart and can have significant long-lasting effects on heart functions (Kamarck & Jennings, 1991). Ventricular arrhythmia occurs when myocardial ischemia, a loss of oxygen in the heart muscle, disrupts the heart's rhythm. Myocardial ischemia occurs when there is a decrease in the blood flow to the heart and body

tissue, which increases the demands on the heart and the force at which blood is expelled from the heart (Gatchel & Oordit, 2003).

Researchers suggest that these diagnoses are the result of the same underlying condition caused by an accumulation of lipids and other cells in the artery walls. These lipids grow and become more visible and dense with increasing age. They continue to grow larger and calcify until the opening of the artery is blocked and blood flow is interrupted, reducing the flow of oxygen to the heart (Guyton & Hall, 1996; Smith & Ruiz, 2002). The blocking of arteries caused by the accumulation of lipids places a great stress on the heart, promoting a disturbance in the heart rhythm that may result in heart beat irregularities, myocardial ischemia, myocardial infarction or in the most severe cases sudden cardiac death (Smith & Ruiz, 2002). Multiple studies suggest that the coronary heart disease diagnoses are not the result of a single variable but are related to a combination of variables that are interrelated and together influence the development and progression of cardiovascular disease. Examples of these factors include a high fat diet, family history of heart disease, and a sedentary lifestyle.

Multiple risk factors have been linked to the development and progression of cardiovascular disease. Cardiovascular disease is associated with older age. For men, the risk increases after age 40 and the risk for women increases after the onset of menopause. After the age of 40, men have a higher rate of cardiovascular disease and are more likely to die from cardiovascular disease than are women (Kamarck & Jennings, 1991). Lower socioeconomic status and lower education have also been identified as risk factors. It is hypothesized that the risk associated with lower socioeconomic class and education may be related to increased rates of obesity, poor dietary habits, cigarette smoking, sedentary lifestyle and less access to adequate medical care (Shwartzman & Glaus, 2000; Uchino, et al., 1996).

Cigarette smoking is strongly correlated with cardiovascular disease, with those smoking more than 20 cigarettes a day having more than twice the risk of developing cardiovascular-related problems (Thompson & Heller, 1990). Cigarette use increases blood pressure and heart rate, constricting peripheral arteries and increases the circulation of cholesterol in the bloodstream. Studies report that about one out of every five coronary heart disease deaths can be attributed to cigarette use (Gatchel & Oordit, 2003). Smoking cessation can have significant effects on coronary heart disease. The American Heart Association (2001) reports that the risk of heart disease is reduced by 50% one year after stopping smoking. This reduction becomes even more significant after fifteen years of not smoking and is comparable to non-smokers risk of developing heart disease.

Obesity, high blood pressure, and heavy alcohol consumption are significant risk factors with those at the highest end of use having the highest risk of developing cardiovascular disease (Jenkins 1988). National Institute on Alcohol Abuse and Addiction (1995) suggest physicians advise all patients to drink in moderation. They define moderate drinking as two drinks or less a day for men and one drink or less a day for women and for people over the age of 65. Research has shown that drinking a single glass or red wine does have some heart benefit; however, heavy drinking has been linked with increased risk of developing heart disease and other health problems (Gatchel & Oordit, 2003). A sedentary lifestyle influences heart disease and health. The American Heart Association (2001) reports that physical inactivity is one of the top risk factors for developing heart disease. Many sedentary adults do not know about the risks of sedentary lifestyle on the development of heart disease (Gatchel & Oordit, 2003).

Several social and psychological factors are believed to protect against cardiovascular disease such as social support, active coping strategies, and psychological well-being. These

protective factors are associated with lessened chance of developing heart problems, decreased mortality, and fewer subsequent health problems following a myocardial infarction (Shwartzman & Glaus, 2000). It is likely that the protective factors are interrelated and they dually influence cognitions and behaviors that in turn, affect an individual's current health status, health-related behaviors and future cardiovascular health problems (Thompson & Heller, 1990). In addition to the behavioral factors associated with cardiovascular disease, social support plays an important role in cardiovascular disease.

Personality Factors

Although personality factors are not directly assessed in the HRS data, these factors are discussed for comprehensiveness, and to provide background about the relationship between personality and heart disease. Suls and Rittenhouse (1990) suggest that an individual's personality style influences the likelihood of contracting an illness and as well as the course of the illness. Styles of interacting have been linked to engaging in positive health maintenance behaviors such regular doctor visits and exercise as well as health risk behaviors such as smoking, drinking alcohol, and poor dietary habits (Somerfield, Stefanek, Smith, & Padberg, 1999). Ingledew and Brunning (1999) suggest that personality traits mediate the relationship between stressful events and physical and psychological functioning (i.e., a stress buffer). Optimistic individuals tend to cope more effectively with a stressful situation than did others. Conversely, those who report a high level of negative emotions such as anger and hostility report less effective coping when faced with a stressor. Extensive research has demonstrated a significant relationship between anger, hostility and cardiovascular-related problems (Frasure-Smith, Lesperance, & Talajic, 1995).

Stone and Costa (1990) found that hostility was an important component contributing to the development of cardiovascular disease and was linked to cardiovascular disease deaths. Carels and colleagues (1999) reported that hostility is associated with heightened cardiovascular reactivity in several populations. Evidence suggests that transient and frequent changes in blood pressure and heart rate may be linked with the development of cardiovascular disease (Guyton & Hall, 1996). Changes that are large and prolonged have particularly negative effects on the heart by decreasing the activation of the parasympathetic nervous system and increasing the sympathetic nervous system, which increases heart activity. This activation results in greater cardiac output and increased peripheral resistance of the blood vessels in the heart. Over time, these changes place greater stress on the heart and can lead to inflammation and damage to the heart muscle, which may serve to further promote the progression of cardiovascular disease (Smith & Ruiz, 2002). These physiological changes are likely related to both the development of and the progression of cardiovascular disease (Itkowitz et al., 2003). Certain negative emotions are believed to be particularly damaging and are linked with prolonged cardiovascular activation.

The emotional component of anger, hostility and verbal and physically aggressive behaviors was significantly predictive of cardiovascular disease (Dembroski, McDougall, Costa, & Grandits, 1989). Smith and Ruiz (2002) suggest that this hostility is manifested in emotional, behavioral and cognitive components that have a widespread impact on cardiovascular health. Hostile people tend to view others with cynicism, mistrust, and are more likely to interpret them as having aggressive intentions. Given these interpretations, hostile people often do not seek out social support in times of stress. Research comparing those high in hostility to others showed a significant difference in the reaction to friends and family members when in a stressful situation. When hostile people were in the presence of friends of family members there was no decrease in

their cardiovascular functioning. However, those low in hostility had a decrease in blood pressure and cardiovascular reactivity when friends or family members were present during a stressful situation (Uchino et al., 1996). These findings suggest that hostile people exhibit higher and more prolonged physiological reactions of those low in hostility and these reactions persist regardless of the support of friends and family members. Studies comparing hostile people to others found differences in the closeness of relationships, availability of social support, and their perception of the social support received. Hostile individuals tend to have smaller social support networks, which serves to further limit the available social support. Hostile people are less likely to benefit from social support and report more negative perceptions of the social support they do receive (Smith & Ruiz, 2002). Hostile people report higher levels of stress and negative emotions, which further contributes to the relationship between hostility and cardiovascular disease.

Stress and negative emotions often precede a myocardial infarction and heart rate irregularities in people with cardiovascular disease (Smith & Ruiz, 2002). Further, heightened physiological reactivity has been linked to higher emotional and blood pressure response to even minor stressors (Carels, Sherwood, Babyak, Gullette, & Coleman, 1999). These individuals had a stronger emotional and physiological response to actual situations as well as imagined stressful situations. In addition to the physiological changes, people with heightened reactivity do not manage stress as effectively as do those with low reactivity. Schewchuk and colleagues (1999) report that high emotional reactivity was associated with poorer coping efforts among individuals with a chronic illness.

Research has shown that hostile people are more physiologically reactive even in the presence of supportive friends and family members and that their reactivity is not significantly

impacted by social support. Smith and Ruiz (2002) suggest that hostile people are likely to alienate themselves from others and are less likely to receive support. Consequently, others are less likely to offer support in times of stress. Highly reactive people reported less social support, more anxiety, depression, and increased emotional reactivity than did others (Carels et al., 1999).

These findings are particularly interesting given that men report higher hostility than do women. Dembroski et al. (1989) reports than hostile men are more likely to engage in verbal and physical aggression and this significantly contributes to health problems. In general, those who reported higher emotional and physiological responses were more than three times more likely to evidence a cardiac ischemia in both laboratory and in real life stressful situations. These findings may partially explain the differences in the size of men's social support network and their tendency not to rely on support during times of stress. Together these factors suggest that men with heart disease who are high in hostility are at a considerable risk for future heart disease events.

Social Support

Holahan and colleagues (1995) define social support "as the perception of emotional sustenance, informational guidance, and tangible assistance (p. 153)." Researchers have demonstrated a strong relationship between physical health, social support, and psychological problems in healthy populations as well as in a number of populations with chronic health conditions such as cardiovascular disease, cancer, diabetes and chronic pain (Hagedoorn, Kuijer, Buunk, DeJong, Wobbles, & Sanderman, 2000). Social support may directly affect health or may work to buffer the effects of prolonged stress associated with managing a chronic illness (Cohen & Willis, 1985). Social support may increase one's coping resources, which in turn increase their beliefs about their control over the situation. It may also effect physiological arousal, immune

functioning, as well as health maintaince behaviors (Fuhrer & Stansfeld, 2002). Previous studies have identified numerous ways to define and measure social support and there is no clear consensus for how to measure social support. However, most studies have shown that satisfaction with social support and perception of social support are very important in the relationship between physical health and depression.

Fuhrer and Stansfeld (2002) identify two separate ways to measure social support. The structure of social support evaluates social support network in terms of size, closeness, number of friends and family, frequency of contact, and marital status. Social support can also be measured in its function, referring to actual or perceived support and the frequency that support is provided. This definition is consistent with that proposed by Cohen and Willis (1985). They state that social support is composed of structural support and functional support. However, they differ in how they define the components of social support. Structural support refers to the quality of social support received and functional support describes the type of support provided. They describe four types of support. Esteem support describes support that increases the recipient's self esteem. Informational support describes the acquisition of important information needed for decisions about health care or treatment options. Social companionship refers to support received from participating in social activities. Instrumental support describes physical help from family or friends such as driving to doctor's appointments if patient can no longer drive themselves (Gatchel & Oordit, 2003). Cohen and Willis (1985) suggest that functional support must match the needs of the individual and the needs of the stressor (Forjaz 2000). That is, when facing a chronic health problem, people may rely more on informational support and effective support is that the matches the need of the individual. However, structural support may have the strongest impact on one's satisfaction with the support they receive. Barrera (1986)

defines social support in a different manner examining social embeddeness. Social embeddeness refers to the depth of one's social support network, which may include contact with spouse, friends, and family. Social embeddeness assesses one's satisfaction with the support received from the individuals in one's social support network (Forjaz & Guarnaccia, 1999). Forjaz and colleagues (1999) found that the amount of social support provided was less important than was one's satisfaction with their social support, which may also contribute to the relationship between hostility and social support. Although researchers differ on some defining qualities of social support, they both suggest that one's satisfaction with social support is an important determinant in the relationship between social support and stress. Using a dataset from the HRS Wave 1, Forjaz (2000) found that satisfaction with social support was related to health and depression in a female cancer population. Satisfaction with social support has been linked to improved cardiovascular health, less functional impairment, and less mortality in a population with heart disease (Greenwood, Packham, Muir, & Madeley, 1995; Newsome & Schultz, 1996). Social support was linked with improved quality of life and more adaptive coping mechanisms (Holahan et al., 1995). Higher social support has been associated with lower blood pressure and decreased cardiovascular reactivity in response to a stressful situation. Conversely, socially isolated individuals had a higher mortality rate, higher incidence of depression and emotional distress, and greater mortality (Thompson & Heller, 1990). Socially isolated men and women had a 3.7 times higher risk for mortality related to cardiovascular disease compared to others in a six-year follow-up study (Brezinka & Kittel, 1995). One source of social support that is often overlooked in the literature is one's relationship with co-workers.

Sherbourne and colleagues (1995) found that employment was related to improved physical and psychological functioning, regardless of the level of depression or health

impairment. Similar research found those who returned to work following a myocardial infarction reported significantly better physical and psychological health compared to those who stayed home (Jenkins 1988). These differences were significant even after accounting for socioeconomic status and educational attainment (Brezinka & Kittel, 1995; Uchino et al., 1996). In addition to the improved physical health, people who return to work report a lower incidence of depressive symptoms and other psychological symptoms at subsequent examinations (Schwartzman & Glaus, 2000). However, researchers caution that these samples may be skewed, because those who return to work are likely in better physical health and are less disabled than are those that do not work (Lewinsohn, Hoberman, & Rosenbaum, 1988). Additionally, returning to gainful employment likely has a significant impact on self-esteem and depression, which may then impact other related factors, such as health maintenance behaviors and social functioning. As the population ages past the age of retirement, research will need to examine the impact of personal relationships on health. Studies show a significant relationship between marital status and health. It is hypothesized that spousal support has an even greater impact on physical and psychological health.

Spousal Support

Marriage provides a number of protective factors to both spouses. Married people tend to be more financially stable, engage in healthier behaviors, and have larger social support networks. They tend to have more emotional support and rely more on social support to cope with a stressor (Ren 1997). Sherbourne and Hays (1990) assert that married people have improved well-being, better physical and mental health, and less functional impairment than do unmarried, divorced or separated people. Further, married individuals have a lower mortality risk, use health care services less frequently, and have an improved survival rate following a

myocardial infarction (Ren 1997). Pienta and colleagues (2000) using the HRS data from Wave 1, also analyzed in this study, reported that marriage was related to better health, lower mortality rates related to physical diseases, less functional impairment and less disability. They found that widows and divorced individuals had the poorest health of all the groups analyzed with higher incidences of physical and psychological health problems, higher utilization of health care services, and greater functional impairment.

Cutrona (1996) suggests that marriage is a significant protective factor for older adults for several reasons. As individuals age, their social support network decreases, children marry and begin their own family, and after retirement a person has significantly fewer social contacts that they had when they were younger (Shye, Mullooly, Freeborn, & Pope, 1995). Due to the smaller social support network, older individuals depend on their spouse more heavily to meet their needs. Spousal support is often critical in the treatment and care of many chronic health conditions (Cutrona 1996; Depner & Ingersoll-Dayton, 1988). Research reports that the quality of the marital relationship can predict physical health and depression at a one-year follow. Further studies found that marital conflict was a significant predictor of future depression and health problems (Frasure-Smith et al., 1995). Since older adults tend to rely more heavily on their spouse for social support, they may likely be at a greater risk of developing subsequent problems if their spousal support is inadequate (Swindle, Cronkite, & Moos, 1989). Older adults who were satisfied with their spousal support had improved physical health, fewer psychological problems, and increased sense of well-being (Tijhuis et al, 1995).

Spouses are crucial in the adjustment of patients with a chronic illness and their support has significant impact patient's ability to cope their illness (Sherbourne & Hays, 1990). Baker and colleagues (2003) report that marital support is related to physiological changes and the

progression of heart disease. Those with high marital satisfaction were significantly less likely to have a left ventricular mass at a 3-year follow-up. Individuals with higher perceived spousal support has lower heart rate, less suppressed anger, and improved emotional health compared to those in less supportive marriages (Sullivan, LaCroix, Russo, Walker, 2001). People who are reported a high marital satisfaction reported higher levels of spousal support and they were more satisfied with the social support they received (Cutrona, 1996). These findings suggest a possible physiological connection between satisfaction with spousal support and cardiovascular health.

Gender Differences in Social Support

There are some significant differences between the social support systems of men and women. Women tend to have more social relationships and more intimate relationships outside the marriage than do men. Women are more likely to report having a closest friend who is not their husband. However, men report their wife as their closest friend (Fuhrer & Stansfeld, 2002). Women report receiving significantly more support from their husbands, family members, friends and neighbors (Thompson & Heller, 1990). One possible explanation for these findings is that women tend to spend more time involved with these friends and are more emotionally intimate with their friends than are men (Antonucci, 1994). Further, women may feel more comfortable talking about their problems and thus receive more support.

Alternate explanations for these gender differences have been suggested. First, there are different expectations for how men and women deal with stress and men are less likely to ask for help when in a crisis (Hooker, Monahan, Shifren, & Hutchison, 1992). Second, women are often the nurturers of outside relationships and when they are unable to sustain these relationships, these relationships may end. If women are unable to maintain these relationships due to their illness, the husband also loses his social support (Stroebe et al., 2001). Since women have higher

social support and are more likely to receive support during times of stress, multiple studies report that women with heart disease benefit less form support than do men (Fuhrer & Stansfeld, 2002). This finding suggests that women have a higher baseline of social support and therefore benefit less from additional support. However, men have a lower baseline level of support and do show benefit from increased support.

There may also be differences in the amount and type of social support that is provided by the social support network of men and women. Studies suggest that women are offered social support when faced with a stressful situation more often than are men. Newsom and Schultz (1996) report that widows receive more social support than do widowers and this support acts as a buffer against future psychological and physical problems. Widowers reported significantly more health and psychological problems than did their female counterparts, even after previous health status were taken into account.

Inadequate social support has some significant effects on the physical and psychological health of men and women. For example, social isolation was predictive of the development of cardiovascular disease and death from cardiovascular disease (Brezinka & Kittel, 1995). Social isolation was a significant predictor of mortality in men and women with cardiovascular disease (Matt & Dean, 1993). However, more men report being socially isolated and it appears that socially isolated men are at a much higher risk than are socially isolated women. Subsequent studies report that divorced and separated men have a heightened risk of mortality related to cardiovascular disease and a higher risk of death following treatment for cardiovascular-related event (Baker et al., 2003). Men tend to have fewer sources of social support and fewer intimate relationships outside the marital relationship and these differences appear to be consistent in later adulthood (Cutrona, 1996; Depner, & Ingersoll-Dayton, 1988). Men report having less social

support and they benefit less from the social support they receive (Thompson & Heller, 1990). Conversely, older women reported having more intimate friends, more supportive relationships, and receiving greater emotional and instrumental support than did older men (Depner & Ingersoll-Dayton, 1988).

Studies suggest that these differences in social support between men and women may become more pronounced in older adulthood. Depner and colleagues (1988) states that older people tend to have a smaller social support network and rely more heavily on friends and neighbors for support (Tower & Kasl, 1995; Tower & Kasl, 1996). Their support network is truncated and they may not rely on others when coping with a stressor. Utilization of social support has been associated with the ability to effectively manage a stressor, better physical and psychological functioning and better prognosis for people diagnosed with a chronic illness (Billings & Moos, 1984; Valentiner, Holahan, & Moos, 1994). Conversely, diminished current physical functioning, poorer future physical health, and decreased psychological functioning have been associated with depression (Sherbourne & Hays, 1995).

Psychological Symptoms

Depression is a reliable predictor of the onset and progression of cardiovascular disease among men and women. Further, a diagnosis of depression is associated with increased risk of mortality independent of cardiac disease severity (Frasure-Smith et al., 1995). Those with depression are a greater risk of future cardiovascular and psychological problems (Tijhuis et al., 1995). Holahan and colleagues (1995) reviewed numerous studies and found that about half of all cardiac patients met criteria for major depression one week following a cardiac event and one-third met criteria for depression at a three-month follow-up. Depression has been used as a reliable predictor of cardiovascular disease outcome and is associated with increased health

problems and mortality related to cardiovascular disease (Frasure-Smith et al., 1995; Smith & Ruiz, 2002). The level of depression and anxiety reported while hospitalized following a cardiac event was predictive of future health and psychological problems among men and women diagnosed with cardiovascular disease after controlling for health status (Frasure-Smith et al., 1995; Smith & Ruiz, 2002). Chronic negative emotions and depression increase the risk of developing cardiovascular disease and can predict future cardiac events (Holahan, Moos, Holahan, & Brennan, 1997).

Schwartzman and Glaus (2000) suggest that depression and cardiovascular disease may have similar underlying mechanisms. During a depressed episode, people have a heightened stress response, higher levels of cortisol in the brain, higher levels of epinephrine released into the bloodstream, enhanced cardiovascular reactivity (Guyton & Hall, 1996; Jenkins, 1998). These factors result in the chronic activation of the sympathetic nervous system related to a continuous stress response and can lead to stress on the heart and cause significant damage to the heart muscles. These finds about the physiological factors are preliminary and is unclear if their relationship is correlative or causative in nature (Baker et al., 2003). Depression can be characterized by a number of behaviors that impact cardiovascular disease. Smith and Ruiz (2000) report that depressed patients are less likely to be compliant with treatment and are less likely to complete a treatment regime. Depression is linked with greater physical pain, increased physical disability, and the use of less effective coping strategies (Bodenmann, Charvoz, Widmer, & Bradbury, 2004). Depressed individuals tend to view themselves and their situation in a more negative manner and are less likely to engage in self-care behaviors. Conversely, individuals with less depression report better physical health, better prognosis, less pain, and reduced utilization of medical care related to their cardiovascular disease (Thompson & Heller,

1990). Individuals who are not depressed tend to cope more effectively with stress and report a higher level of social support (McCaul, Sandrgren, King, & O'Donnell, 1999). Recent studies report among men and women with cardiovascular disease women are more than twice as likely to be diagnosed with depression as are men (Brezinka & Kittel, 1995). These differences are similar to those found in the population and may represent differences in symptom manifestation or that women are more likely to seek out psychiatric treatment (Swindle et al., 1989).

Gender and Psychological Symptoms

There are significant gender differences related to the development of cardiovascular disease and prognosis following a cardiovascular-related event. For example, mortality following a myocardial infarction is higher for women regardless of depression. Women have a significantly higher risk of depression in the hospital and at a six-month follow-up (Holahan et al., 1995). Women report more pain, greater depression, and are less compliant with rehabilitation programs following a myocardial infarction. Women also reported lower quality of life, greater somatic symptoms and more sexual dysfunction than did males (Brezinka & Kittel, 1995; Schwartzman & Glaus, 2000). Current depressive symptoms and a history of depression have also been linked with a poorer prognosis for both physical and psychological functioning (Holahan et al., 1991). Depression is a reliable predictor of cardiovascular disease, particular in women. Severity of depression is related to onset of cardiovascular disease, reported chest pain, and other behavioral risk factors such as smoking and physical inactivity among women (Schwartzman & Glaus, 2000). Together these findings suggest that depression is a more significant risk factor for women with cardiovascular disease.

Tower and Kasl (1996) report some interesting findings about depression in older married couples. A spouse's level of depression had a significant effect on the other spouse's depression

level. Further, these effects were significant even after controlling for other risk factors such as poor health, loss of a loved one, and financial concerns. That is, if a husband reported depression his wife was more likely to also report depression regardless of their current stressors. These findings were consistent for both men and women. There are several possible explanations for the similarities between husbands and wives depressions cores. First, if one partner is depressed they will be less able to provide support and engage in fewer social activities. This would significantly decrease the not only the amount of social support they receive but also the social support provided to their partner. Second, this loss of support is compounded by the smaller social networks characteristic of older adults. As individuals age, their available social support lessen and they rely more heavily on the marital relationship to meet their needs (Depner & Ingersoll-Dayton, 1988; Russell & Cutrona, 1991). Spousal support become even more important for older adults with chronic problems because they have a greater need for prolonged social support and may have fewer available resources (Hagedoorn et al., 2000; Thompson & Heller, 1990). Older adults coping with a chronic illness have greater need for social support and the spouse is their primary support, so if their spouse is depressed, they also face a significant risk of developing depression. Depression impacts one's ability to provide support as well as one's ability to effectively manage a stressor, such as coping with a chronic illness. Depressed individuals use less adaptive coping strategies and are less effective at managing stress (Thompson & Heller, 1990). These ineffective coping efforts further contribute to their depression by providing depressed people with a sense of helpless over managing stress (Holahan et al., 1997).

Models of Social Support

Research has consistently demonstrated the relationship between physical health, social support, and depression (Holahan et al., 1995; Swindle et al., 1989). However, studies have not determined the exact nature of the relationship between physical health, social support, and depression. It should be noted that the concepts of social support and depression are not entirely distinct entities; rather, they interact and mutually influence each other. In this model, having a chronic illness is conceptualized as a prolonged stressor that requires diverse coping strategies and adaptive behavior over a prolonged period of time. Cohen and Willis (1985) suggest a stress buffering model to explain the association between physical health, social support, and depression.

Stress-Buffering Model

The stress-buffering model suggests that social support protects people against the negative impact of stress. This model states that social support is related to a person's sense of well-being when facing with a stressful situation (Tijhuis et al., 1995). There are several factors that impact social support such as personality traits, size of social support network, number of intimate friends, and the type of support they received from these individuals (Holahan et al., 1995). As the demands of a stressor increase, a greater level of social support is needed for the individual to cope effectively. Chronic illness can be conceptualized as a recurrent stressor that requires increasing personal and social resources to be managed effectively. When a stressor is chronic and requires prolonged coping efforts, an individual's resources may be depleted over time and increase their susceptibility to psychological problems such as depression (Valentiner et al., 1994). At low levels of stress, the need for resources is small and thus social support does not have a strong impact on depression. However, as stress increases, social support becomes increasingly important in protecting against the development of depression.

People with higher social support can cope with a stressful situation more effectively than those with less social support. Research supporting this model has defined social support by measuring one's social support network and the satisfaction with the amount of support received (Cohen & Willis, 1985). According to this model, social support is related to psychological distress in persons currently experiencing a high level of stress (Forjaz & Guarnaccia, 2000). At low levels of stress, the need for social support is low, psychological distress is minimal and the availability of support is not that important. However, as stress increases, individuals with less social support will have increased psychological distress because they do not have the necessary social support to deal with the stressor effectively (Newsom & Schulz, 1996). Research findings have provided strong evidence for the stress buffer model (Tijhuis et al., 1995). Greenwood and colleagues (1995) report that patients with a high level of stress and a low level of social support had four times greater risk of mortality during a three-year study of cardiac patients. They state that patients who did not attend social events, had no spouse, and had low social support had a significantly worse prognosis than did others.

Wortman (1984) suggests that social support works as a stress buffer in several ways. Individuals who have more social support are more likely to engage in health maintenance behaviors such as regular doctor visits and taking prescribed medications. These behaviors in turn impact the likelihood to developing health problem and the severity of health problems that are developed. People with more social support tend to view situations are as more manageable and use more effective coping strategies than do others (Swindle et al., 1989). Individuals with more social support report less depression and are less emotionally reactive to stressful events (Carels et al., 1999). There may also be differences related to those who have a high level of social support. Cutrona (1996) suggests a slightly different perspective on the stress buffering

model. She states that the stress-buffer model predicts a strong correlation between mental and physical health related to the level of social support. However, she suggests that social support has a buffering effect on mental and physical health regardless of health status. That is, that social support is beneficial on psychological functioning regardless of a person's current stress related to their physical illness. Research has traditionally tested the theory with those at a high stress level; however, other studies report that social support is related to improved physical and psychological functioning even in a healthy population (Russell & Cutrona, 1991).

Research on cardiovascular disease has included primarily men. Some studies have included women with heart disease; however, few studies have compared men and women with heart disease. These studies have found significant differences between men and women diagnosed with cardiovascular disease. Women tend to have a larger social support network and more intimate relationships than do men. Women benefit more from the emotional support they receive from friends and family (Brezinka & Kittel, 1995). However, the prognosis for women is with heart disease is much worse, they are less likely to comply with medical treatment, and have a higher incidence of mortality following a myocardial infarction than do men (Jacobs & Sherwood, 1996). Women report higher levels of distress and depression and poorer coping than do men (Holahan et al., 1991). Jacobs and Sherwood (1996) suggest that the there is a similar relationship for social support and depression among men and women with heart disease but women are more impacted because of the demand of multiple role obligations. Women who reported significant stress related to fulfilling family and work roles were more likely to have heart disease. In addition to the stress of fulfilling multiple roles, women often provide emotional support to others and help to maintain social connections. When these demands are added to the stress of managing a chronic illness, women's resources may not sufficient and they have greater

distress and depression (Jacobs & Sherwood, 1996; Schwartzman & Glaus, 2000). These findings provide one possible explanation for the gender differences in cardiovascular disease.

The Present Study

This study examined the relationship between physical health, social support, and psychological functioning in patients diagnosed with cardiovascular disease and their spouses. Many studies have demonstrated a relationship between health, social support, and psychological functioning; however, the exact nature of the relationship is unclear. This study tested the stress buffer model. A chronic health condition is conceptualized as a stressor that requires prolonged social support to effectively manage and inadequate social support results in an increased risk of depression. We hypothesized that as illness stress increases, greater social support will be needed to cope effectively. That is, those with a high level of illness stress and low social support will have increased depression. We also examined the effect of spousal support versus other forms of social support of depression among men and women with heart disease. Spousal support has been shown to be the primary source of social support among older adults and is critical in their spouse's adjustment to a chronic health problem (Baker et al., 2003; Sherbourne & Hays, 1990). We hypothesized that spousal support will have a significant impact on the relationship between cardiovascular disease and depression. This study also explored gender differences related to heart disease, social support and depression. We predicted significant differences between men and women with heart disease. The use of cigarettes, alcohol, and exercise were also examined, as they directly impact heart disease and physical health.

CHAPTER II

Method

Procedure

The Health and Retirement Study (HRS) is a nationally representative study of individuals from 51-61 years old and their spouses. Each respondent was paid $10.00 for their individual participation and $30.00 for each couple. If participants refused initially, they were approached a second time and offered $20.00 for their individual participation and $60.00 for the participation of them and their spouse. The second request resulted in 503 more cases accepted. For those who refused the second request, they were mailed a letter offering $100.00 for their individual participation and $299.00 for the participation of them and their spouse. The third request resulted in an additional 612 cases. Overall, these attempts resulted in 12,654 participants and an 82% response rate among these participants (Juster & Suzman, 1995). Each interview required approximately 130 minutes to be completed. The Demographics, Physical Health and Functions, and Family Structure and Transfers Sections were completed by each spouse (HRS Study Wave 1, 1992).

Participants and Study Characteristics

The participants of this study were obtained from the HRS (Juster & Suzman, 1995). The HRS is a longitudinal study examining the interactions between health, economic status, and behavior and work status in an older adult sample. The National Institute on Aging and the Institute for Social Research of the University of Michigan has funded this study. The HRS data is composed of three waves. Wave 1 was collected in 1992 and 1993. Wave 2 was collected in 1994 and 1995. Wave 3 was collected in 1996. Additional information was collected in 1998, 2000 and 2002 concerning activities of daily living, cognitive status, health and retirement

planning, alcohol consumption, pain disorders, stress and social support and education and financial decisions made in later life. This study will focus on data collected from Wave 1, which was collected in 1992 and 1993. The data analyzed was limited to a cross-sectional analysis as the focus of this study was to provide clinical information about the impact of social support on depression in a middle-aged/older adult population.

The sample is composed of a national sample of 7,600 households with the primary respondent born between 1931 and 1941 and their spouse if available. The sample was composed of about 12,600 interviews. The selected respondent was aged 51-61 at the initial interview. Each interview involved the selected respondent and their spouse, regardless of the spouse's age. Demographic information for all participants is shown in Table 1.

The HRS study was designed by economist to provide information about financial resources and measure very specific domains of current income/financial support. In some cases, respondents were asked which partner knew more about finances and this person was selected as the primary respondent. These questions assessed financial resources of the calendar year 1991. The items were listed in Section D Housing and included wages/salary, money from property, stocks/mutual funds, IRAs, bonds, other assets, and other forms of support (i.e. support from family members). This information was gathered from the "person most knowledgeable about financial matters," which consisted of a single individual from each household. Information was reported for 7607 individuals. The mean income from all the sources in 1991 was $45,099 (SD= $53,386). The range of income was $10,000 to $1,377,867 (HRS Study Wave 1, 1992).

Study sample. A subsample of the HRS Wave 1 participants was used for the current analyses. The sample is composed of married participants and their spouses aged 51 to 71. Participants and spouses that were not within this age group were excluded. The participant or

their spouse must have cardiovascular disease, congestive heart failure, a recent myocardial infarction, or other chronic heart-related conditions. The HRS study arbitrarily chose one partner as the respondent and one partner as the spouse; therefore, either participants or their spouses who have cardiovascular disease were included in our analyses. Given that the participant or their spouse may have cardiovascular disease and we were primarily interested in the marital unit, we designed the database to examine the relationship between participant and spouse as well as the relationship between spouse and participant. Participants must have completed the survey themselves and must be currently residing with their spouse.

These analyses were conducted using respondents and spouses as both members of a couple, so each was included as both a participant and as a spouse. This was done because the determination of participant versus responding spouse was made arbitrarily. To have both partners appear as participants, the data was arranged in a somewhat atypical manner with each couple listed two times. They were listed first as participant data with their spouse's data within the same case, and then a second time with their participating spouse observations being switched. In this second listing, the spouse became the reporting participant and the original participant became the reporting spouse in this dataset. To avoid double counting at any time, care was always taken to never include the same individuals two times in any single analysis. Additionally, since the primary focus was the marital relationship between middle age/older adults, this allowed men and women to appear as participants in equal number.

The study consisted of 2857 married couples, composed of 5714 individual participants. Both participants' and spouses' ages were selected to be in the range from 51 to 71 years old with a mean age of 57.7 years (SD= 4.3). Participants were composed of 79.3% Caucasians, 11.1% African Americans, 8.2% Hispanic Americans, 0.8% Asian and Pacific Islanders, and

0.7% American Indian and Alaskan Natives. 53% were high school graduates, 8.4% had earned a GED, and 38.6% had not graduated high school.

For the analyses of people with heart disease, further cuts were made so at least the participant or the spouse or both had some level of heart disease (possibly as minor as high blood pressure). An example of calculating the level of heart disease is given for high blood pressure. If high blood pressure was controlled by medication, participants would receive a single point. However, if they had high blood pressure that was not controlled by medication, they would receive another point contributing to their level of Heart Disease.

The subsample of only participants with some level of heart disease totaled 2859 (Men= 1433, Women= 1156). The mean age of participants was 58.31 years (SD= 4.35). The mean age of men was 59.61 years (SD= 4.51) and for women the mean age was 56.90 years (SD= 3.52). There was a significant difference between the age of men and women with heart disease (t= 18.38, p=. 000). Participants were composed of 75.9% Caucasians, 21.9% African Americans, 0.8% Hispanic Americans, 0.8% Asian and Pacific Islanders, and 0.7% American Indian and Alaskan Natives. The mean level of education completed was 11.87 (SD= 3.28).

Materials

The HRS Wave 1 study includes the core survey that is given to each household and ten experimental modules that are given to a limited number of participants. The core survey consists of fourteen sections. This study will use data collected from the following core survey sections: Demographics, Physical Health and Functioning, Family Structure and Transfers. The Demographics section reports participant's marital status. The Physical Health and Functioning section was used to determine physical health, physical and occupational functioning and level of impairment. The Family Structure and Transfers section was used to assess social support from

spouse, family members, friends, and neighbors and satisfaction with social support. The Housing section was used to assess mean income level from wages, stocks/mutual funds, IRA, and other assets.

Cardiovascular Disease Construct.

Cardiovascular disease was conceptualized as a disease continuum with the number of heart related diagnoses and treatments being counted once, providing a total cardiovascular disease score. A high score indicates a high level of cardiovascular disease and poorer health. Specific diagnoses such as congestive heart failure were counted twice, as this disease is associated with poorer health and represents a higher level of cardiovascular disease.

Specific health criteria were used to obtain a sample that was experiencing current stress related to their heart problems and to separate them from others who had previous heart problems but were not receiving current treatment. The criteria for participants was that they received medical treatment in the past year for a heart condition such as doctor visits, medication, surgery, were hospitalized due to heart problems, or had a myocardial infarction in the past year. Each treatment received was counted once and added to the total cardiovascular disease score. The questions used to determine each construct is provided in Appendix A.

Other Disease Construct

A separate construct was composed of various health problems to further assess health and current disease status not related to cardiovascular disease. This construct was designed as a health continuum with each disease counting once and each treatment received in the last year counted once with a total score calculated. A higher score indicates a higher level of disease and poorer health. The following diseases were included in this construct: cancer, lung disease, stroke, asthma, arthritis, back problems, feet and leg problems, kidney and bladder problems,

stomach ulcers, high cholesterol, and chronic pain. The questions used to determine this construct were obtained from the HRS Health Status questionnaire and are listed in Appendix A.

Social Support Measure

This data is archival and a standardized measure of social support was not used in the original HRS data collection. Therefore, social support was constructed from several questions from the Family Structure and Transfers core survey. Previous research using this data sample found that satisfaction with social support was strongly correlated to psychological health and we will use a similar model to determine the relationship between satisfaction with social support, physical health and psychological functioning (Forjaz & Guarnaccia, 1999). The items included the following questions; satisfaction with friendships, satisfaction with family life, satisfaction with their marriage, and the amount of time spent with their spouse engaging in enjoyable activities. It should be noted that the subsample included only participants that are married, as previous research has demonstrated a strong link between spousal support and physical functioning among older adults (Koskenvuo et al., 1981). Social support was determined the HRS Family Structure and Transfers questionnaire items provided in the Appendix A.

Psychological Distress Measure

Psychological distress was measured using the Center for Epidemiological Studies Depression short-form (CES-D). The CES-D is a reliable measure of depression that has adequate discriminatory ability and has adequate reliability (Wallace & Herzog, 1995). The HRS study used an abbreviated version of the CES-D that included 11 items compared to their original 20 items. Participants are asked to rate the symptoms they have experienced in the last week on a 4-point Likert-type scale. The scores range from 1 to 4 with 1 indicating a symptom was present “all or most of the time” and 4 indicating that a symptom was present “none or

almost none of the time." The CES-D was reverse scored so a higher score would indicate greater depression.

Wallace and Herzog (1995) report that the CES-D is a reliable measure of depression in the HRS Wave 1 sample. They report that reliability coefficients were .84 among the 11 items and adequate concurrent, discriminant and construct validities. Construct validity was supported by the correlation between depression and self-reported psychiatric problems among participants in the HRS sample (Wallace & Herzog, 1995).

Self-reported psychiatric problems, treatment of psychiatric problems in the last year, current treatment or medication for psychiatric problems, and self-reported emotional health were included in the measure of psychological health. Self-reported psychiatric problems, treatment in the past year, and current treatment or medication for psychiatric problems was counted once for each statement endorsed. Self-reported emotional health was rated on a Likert-type scale with 1 indicating "Excellent" emotional health and 5 indicating "Poor" emotional health. Participants also ranked their subjective quality of life by answering items about their health (1= "excellent" to 5 = "poor") and a comparison between their current health and their health the previous year (1= "much better" to 5 = "much worse"). These items are listed in Appendix A.

Heart disease/Depression Related Behaviors Measure

The HRS data did not include a standardized measure of related behaviors that directly impact heart disease. However, research has demonstrated a clear relationship between some behaviors and the progression and development of heart disease. Studies have also found a link between these behaviors and depression. Exercise has been linked with decreased risk of developing heart disease and a slower progression of disease. Specifically, the amount and

frequency of exercise has been linked to decreased heart disease diagnosis and improved physical functioning among those with heart disease. Exercise has been associated with less depression and studies suggest that exercise may provide protection against depression (American Heart Association, 2001). The frequency and type of weekly exercise activities was assessed by three questions about light exercise, vigorous exercise and heavy housework. Responses ranged from 1 indicating that the activity is engaged in "3 or more times a week" to 5 indicting that the activity was engaged in "never." These items were reverse scored so a higher score indicated engaging in exercise more frequently. Depression scores were assessed by the CES-D.

The excessive use of alcohol and cigarettes has been linked with increased risk of a heart disease diagnosis, increased functional impairment, and increased mortality among those with cardiovascular disease (Jenkins 1988). Excessive use of alcohol and cigarettes has been linked to increased depression and greater psychological distress (Swindle et al., 1989). Items assessing the current use of alcohol and the number of cigarettes smoked each week were calculated. These questions were obtained from the Health Status section and are shown Appendix A.

Hypotheses

This study tested the Stress Buffer Model. We predicted that participants with a high level of heart disease and low social support would have higher levels of depression. We also hypothesized that there would be differences in the relationship between disease, social support and depression between men and women with cardiovascular disease.

CHAPTER III

RESULTS

Descriptive Statistics for All Participants

The sample with all respondents with and without heart disease totaled 5714 individuals (2857 married couples). Among this sample, the mean age was 56.21 years (SD= 3.50). As seen in Table 2, there was a significant age difference between men and women (*t*= 19.70, *p*= 000). These married men were older (mean age= 59.16, SD= 4.50) than the couples-matched married women (mean age= 56.21, SD= 3.50), which is representative of overall gender differences in the population. The mean number of psychiatric problems reported by men was 2.78 (SD= 1.51) and the mean for women was 2.53 (SD= 1.31). Women reported more depression (mean= 1.43, SD= .40) than did men (mean= 1.35, SD= 34). Women were significantly more depressed than were men (*t* = -7.97, *p*=. 000). Women reported more psychiatric problems that did men (*t*= -6.62, *p*=. 000). This finding was expected given the higher incidence of women with psychiatric diagnoses and the higher number of women who seek treatment.

The overall mean for cigarette packs smoked a week was .22 (SD= .42). The mean number of cigarettes smoked by men was .26 (SD= .57) and the mean cigarette packs smoked by women was .20 (SD= .45). The number of cigarette packs smoked by men was significantly higher than the number smoked by women (*t*= 19.16, *p*= .000). The overall mean for alcohol use was .82 (SD= .84). A score of 0 indicates a response of less than 1 drink a day and a response of 1 indicates 1 to 2 drinks a day. The mean for men's alcohol use was .97 (SD= .93) and the mean for women's alcohol use was .66 (SD= .70). There was a significant gender difference in alcohol use with men drinking more alcohol than did women (*t*= 58.12, *p*= .000). However, there were few heavy drinkers in this sample.

Comparing all Participants to Participants with Heart Disease

These results are shown in Table 5. Participants with no heart disease totaled 3125 and those with some level of heart disease totaled 2589. Men and women with heart disease had a higher level of other disease and a greater variability (mean= 4.22, SD= 3.77) than did those without heart disease (mean= 2.76, SD= 3.00). There was a significant difference between level of other disease in those with and without heart disease (t= -15.95, p= .000). These findings indicate that those with heart disease have a higher incidence of other diseases and thus had a higher level of illness stress. This is consistent with previous studies finding that those with heart disease had worse overall health and greater physical impairment (American Heart Association, 2001).

Descriptive Statistics for Participants with Heart Disease

The analyses of only men and women with heart disease were composed of 2859 individuals, 1433 men and 1156 women. These results are listed in Table 3. Among men and women with heart disease, the mean age was 58.32 (SD= 4.34). The mean age of men was 59.59 (SD= 4.52) and the mean age of women was 56.72 (SD= 3.51). There was a significant age difference between men and women (t= 17.54, p= 000). Men were older than women, which is consistent with overall trends in gender differences in the population. There were no significant differences in education levels of men and women (t= 1.17, p= .240).

The overall mean level of heart disease was 2.94 (SD= 2.16, Range= 1-14). The mean level of heart disease for men was 3.23 (SD= 2.42) and for women was 2.58 (SD= 1.73). Men had a higher level of heart disease than did women (t= 1.53, p= .000). This finding is consistent with studies reporting that more men are diagnosed with heart disease than women. The mean level of other disease among men and women was 3.82 (SD= 3.21, Range= 1- 21). The mean

level of other disease for men was 3.76 (SD= 3.21) and the mean for women was 3.90 (SD= 3.22). Women reported a higher level of other disease than did men (*t*= -5.31, *p*= .000). The higher score of other disease among women suggests they also have significant illness stress but that stress is not directly related to a heart disease diagnosis.

The overall mean for self-reported psychiatric problems among people with heart disease was a mean of 2.72 (SD= 1.44), which is higher than that of sample with and without heart disease (*t*=-11.39, *p*= .000). Women reported more other psychiatric problems (mean= 2.78, SD= 1.51) and than did men (mean= 2.53, SD= 1.30). Women had significantly more psychiatric problems than did men (*t*= -4.71, *p*= .000). The higher incidence of womens' psychiatric problems is consistent with expected findings that more women are diagnosed with psychiatric problems and they seek treatment for these problems. Men reported higher total social support (mean= 21.77, SD= 2.21) than did women (mean= 21.46, SD= 2.46). Men reported significantly more social support than did women (*t*= 5.14, *p* = .000). Men reported significantly higher support from their wives (*t*= 5.31, *p*= .000), satisfaction with their family life (*t* =3.38, *p*= .000), and satisfaction with the time they spend with their spouse (*t*= 7.87, *p*= .000).

Men smoked significantly more cigarette packs a week than did women (*t*= 2.94, *p*= .003). The overall mean for alcohol use was .81 (SD= .87). A response of 0 indicates less than 1 drink a day and a response of 1 indicates 1 to 2 drinks a day. The average alcohol use for men was .96 (SD= .95) and the average alcohol use for women was .61 (SD= .70). Men drank alcohol more than did women (*t*= 10.46, *p* = .000). However, there were few heavy drinkers in the sample. Gender differences in scaled scores are listed in Table 4.

Comparing men and women with heart disease. Men and women with heart disease smoked and average of .20 (SD= 49) cigarette packs a week. Those with heart disease smoked

significantly less than did those without heart disease (t= 3.85, p= .000). However, there were fewer smokers among men and women with heart disease. This study did not ascertain participant's smoking history and thus no information is known about how much a participant smoked in the past. Those with heart disease exercised less than those without heart disease (t= 4.16, p= .000). Differences in exercise may have been impacted by physical impairment related to heart disease or this may represent a true lifestyle difference between those with and without heart disease.

Those with heart disease had higher scores on the CES-D than did those without heart disease (t= -19.37, p = .000). Those with heart disease also reported significantly more other psychological problems than did those without heart disease (t= -11.39, p= .000). These findings are consistent with previous studies suggesting that health problems are related to increased psychological problems and depression. The results suggest that people with a higher level of illness stress either related to heart disease or other disease, were significantly more depressed than were others. This suggests that illness stress is significantly related to depression in married middle aged/older adults.

Men and women with heart disease reported significantly less other social support (t= 3.81, p = .000) and less spousal social support (t = 3.31, p= .001) than did those with no heart disease. These results are consistent with previous studies and indicate that those with high illness stress/disease report less social support. This finding is consistent with the stress buffer model and suggests that individuals with a high illness stress who have less social support will have higher levels of depression. Overall these findings are consistent with the researcher's expectations and those reported by previous studies.

Inferential Statistics

Correlations for all Participants

This first analysis consisted of 5714 individuals (2857 married couples) with and without heart disease. These results are shown in Table 6. The CES-D correlated significantly with other self-reported psychiatric problems (r= .585, p=. 000). The CES-D correlated with total social support (r= -.403, p= .000), indicating that lower levels of depression were related to higher social support. Since marital relationships are the focus of this study, the social support construct was subdivided into spousal support and other social support. The CES-D correlated with spousal support (r= -.353, p= .000) and other social support (r= -.351, p= .000). Low social support was related to higher levels of depression. The CES-D correlated with level of heart disease (r=. 160, p=. 000) and level of other disease (r=. 392, p= .000), indicating that depression was related higher disease levels. Spousal support correlated with level of heart disease (r= -.053, p= .004) and level of other disease (r= -.102, p= 000). Less spousal support was related to higher levels of heart disease and other disease. Spousal support correlated with other social support (r= .422, p=. 000). Other social support correlated with level of heart disease (r= -.051 p=. 007) and level of other disease (r= -.137, p= .000). Less other social support was related to higher level of heart disease and other disease. Initial review of psychological distress had included measures of current psychological treatment, self-rated emotional health, and current psychotropic medications; however, these were discarded because they were not psychometrically sound. The CES-D was use as the primary instrument to assess depression and psychological distress.

Correlations for participants and their spouses. The correlation table for participants matched with their spouses examined the interrelationship between married spouses. These results are listed in Table 7. Participant's CES-D score correlated with their spouse's CES-D score (r= .243). Participants' reported depression was related to their spouse's reported depression. Participant's CES-D correlated with their level of heart disease (r= .134) and their level of other disease (r= .394), indicting that depression was linked to greater illness. Participant's CES-D correlated with their spouse's level of heart disease (r= .067) and their spouse's level of other disease (r= .206). Participant's depression score was related to their spouse's level of heart disease and other disease. Participants CES-D score correlated with spousal support (r= -.325) and with other social support (r= -.343). These scores suggest that decreased spousal and other social support is associated with increased levels of depression. Spouse's CES-D score correlated with their level of heart disease (r= .162) and their level of other disease (r= .335), suggesting that depression is linked to greater health problems. Spouse's CES-D score correlated with spousal support (r= -.338) and other social support (r= -.346). These scores indicate that spouse's depression was related to low levels of social support from spouse and from others.

Participants with Heart Disease

Men with heart disease. These results are shown in Table 9. The correlation table for men heart disease consisted of 1433 men. The CES-D correlated with spousal support (r= -.288) and other social support (r= -.336), indicating depression was linked to less support. The CES-D correlated with level of heart disease (r= .179) and level of other disease (r= .390). Depression was related to increased heart disease and other disease. Among men with heart disease, their CES-D score correlated with their spouses CES-D score (r= .260), indicating similarities in

depression levels in married couples. This finding is consistent with those reported by Tower and Kasl (1996) who found similar trends between depression scores among older married adults.

Participant's CES-D scores was correlated with their spouse's level of heart disease (r = .089) and their spouse's level of other disease (*r*= .231). Participant's depression was related to their spouse's level of heart disease and other disease. This finding supports the importance of spousal support in older couples. Spouse CES-D score was correlated with their reported spousal support (*r*= -.328), indicating that low spousal support was related to increased depression among men with heart disease. Spouse CES-D score was correlated with their participant's reported level of other disease (*r*= .350). Wives' depression was related to increased other disease problems only men with heart disease. Men's report of the spousal support they receive correlated with the spousal support they provide their spouses (*r*= .382) and to their level of other social support (r = .468). Level of heart disease was correlated to level of other disease (*r*= .288).

Women with heart disease. These results are shown in Table 10. Among women with heart disease, their CES-D score correlated with heart disease (*r*= .134) and other disease (*r*= .394), indicating that depression was linked with more disease. Their CES-D score correlated with spousal support (*r*= -.325) and other social support (*r*= -.343), indicating depression was liked with less social support. CES-D score correlated with exercise (*r*= -.222), suggesting that depression is linked with less exercise. Women's CES-D score correlated with their husband's CES-D score (*r*= .243).

Spouses of Participants with Heart Disease

Wives of men with heart disease. The results for participants with heart disease matched with their spouses in listed in Table 7. Among the wives of men with heart disease, spousal support correlated with their CES-D score (*r*= -.328). Low spousal support was associated with

increased depression. Spousal support correlated with their spouse's reported spousal support (*r*= .460) and the wives report of other social support (*r*= .421). These scores suggest a consistency about reported social support between husbands with heart disease and their wives. Wives level of other disease correlated with their CES-D score (*r*= .390), indicating that higher disease was associated with depression. Wives CES-D score was correlated with their husband's CES-D score (*r*= .350), indicating some similar trends in depression scores in married couples. These results are consistent with those reported for all participants, men with heart disease and their spouses. These data demonstrate a clear relationship between disease, less social support and depression among married middle aged/older adults.

Husbands of women with heart disease. Among the husbands of women with heart disease, spousal support correlated with their CES-D score (*r*= -.214). Depression was linked to less social support. Spousal support correlated with their wife's reported spousal support (*r*= .421). Spousal support correlated with other social support (*r*= .438), indicating similarities across support domains. Husbands' level of other disease correlated with their CES-D score (*r*= .335) and their level of heart disease (*r*= -.346). Depression was correlated with increased disease level. Overall these scores are consistent across groups and indicate a strong relationship between depression, support and health. Further, this relationship was found in groups with and without physical health problems suggesting that social support may impact depression even in absence of significant health problems. There were similarities between married couples in their heart disease, other disease, depression, and reported levels of social support.

Initially, this study examined heart disease and other disease as separate constructs. However, the analyses indicated that both heart disease and other disease were significantly related to depression in married couples. Originally, the heart disease construct was developed to

provide a specific measure of heart disease related variables. Where as, the other diseases construct was designed as a broad measure of various health related variables. The analyses were first attempted using only heart disease but further analyses revealed that total disease was a more meaningful construct, as it included a broader range of disease items. This broader range of disease items is believed to provide a more accurate picture of middle aged/older married adults with a chronic health problem. The focus of this study was to provide clinically meaningful information to assist in identifying appropriate therapeutic interventions for these individuals. It became apparent that focusing on a broad disease construct that was typical of many middle aged/older adults would be more beneficial than to focus on a single diagnostic category such as heart disease. Using a broad diseases construct allows us to gain valuable information that is generalizable to a middle aged/older adult married population. This information can be used to identify appropriate interventions and work to address health within the family system.

We combined the constructs of heart disease and other diseases into a total disease construct. Total disease was developed by performing Z-score transformations on the heart disease and other disease constructs and added the products. Although total disease is a more broad health construct than is heart disease, the items in total disease have a large percentage of heart disease items (i.e. 14 heart disease questions out of 35 total questions). The items included on the total disease construct included all the items from the heart disease construct and all the items from the other disease construct. These questions are provided in Appendix A.

Regression

As outlined in Aiken and West (1991) in order to correctly calculate interaction terms in these regression models, first the Z-score of each variable with a potential interaction was computed and the these Z-scores were multiplied together to form the interaction term. Main

effects are entered first as the Z-score transformed source variables. The interaction is next entered as the Z-score products. They advise this procedure in order to accurately calculate the magnitude of the interaction effects. Z-test for differences in standardized Beta was calculated between men and women for the entire sample and for those with heart disease. All of these Z-tests were nonsignificant, with the largest one being for all participants the difference on the impact of other disease for men versus women (z= 1.40, NS).

In this study, two aspects of the determination of dependence between men and women were evaluated. The first elevational difference, evaluated with a series of T-test comparisons. The second and more complex comparison, compared predictor models for married men and women with heart disease. For this model, a regression model was first established for all participants. A regression model was then established for men and women with some level of heart disease. This was repeated splitting the entire sample separating by heart disease and by gender. The regressions split on gender were then used to compare the association levels (Standardized Beta) with depression. In these analyses, there were no significant gender differences.

Regression Model for all Participants

The first regression model analyzed all 5714 participants with and without heart disease. These results are listed in Table 11. The first step was entered as total disease, as it was a more comprehensive model of health status among men and women with heart disease. Total disease was associated with increased depression (F= 853.57, Beta= .286). The next step was entered as total disease, exercise and cigarette pack. In step two, exercise was associated with less depression (Beta= -.112) and cigarette packs smoked per week was linked to a higher depression (Beta= .042). The third step was entered as total disease, exercise, cigarette pack, other social

support and spousal support. Other social support was associated with less depression (Beta= -.214). Spousal social support was linked to a less depression (Beta= -.187). The final step was entered as total disease, exercise, cigarette pack, other social support, spousal support, and the interactions of Total Disease by Other Social Support and Total Disease by Spousal Support. The interaction between total disease and other social support was related to less depression (Beta= -.036) and the interactions between total disease and spousal social support was associated with less depression (Beta= -.033). Each of the steps in this regression model demonstrated a significant F change.

For the following regression models, the steps were entered in the same order as they were for all participants. These results were stable among all participants, all men, all women, men and women with heart disease, men with heart disease, and women with heart disease. For all the models listed below, each step demonstrated a significant F change. The second regression model included male participants with and without heart disease (N= 2857). The results are shown in Table 12. A third regression model that included women with and without heart disease (N= 2857). These results are shown in Table 13. The fourth regression model included only men and women with some level of heart disease (N= 2589). These results are shown in Table 14. The next regression model included only men with some level of heart disease (N= 1433). These results are listed in Table 15. The final regression model included only women with some level of heart disease (N= 1156). These results are shown in Table 16. The regressions split on gender were used to compare the association levels (Standardized Beta) with depression, which demonstrated no significant gender differences.

CHAPTER IV

DISCUSSION

In the course of running analyses, both path analytic and structural equation models (SEM) were attempted, neither resulted in meaningful results. SEM analyses that modeled both the social support constructs as mediating the impact of disease on depression outcome never successfully ran to completion. Similar difficulties were found in related path analytic models, with nonsensical path coefficients resulting. In the course of understanding these analytic difficulties, the importance of the focus of this project on current circumstances (i.e., as modeled in these cross-sectional analyses) became clear. As mentioned later in the discussion on clinical implications, this work primarily concerns couples current functioning, and is not concerned with longitudinal predictors. Within this cross-sectional focus, the analytic relationships between social support and total disease were found to be in the form of a statistical interaction and not in the form of an intervening relationship with disease affecting social support.

This study tested a stress buffer model and predicted that those with a high level of disease or illness stress and low social support would have increased depression. Those living with a chronic disease have increased stress related to coping with their illness, multiple doctor visits, medications, and medical procedures. The findings support the stress buffer model among men and women with heart disease. The interaction indicates that social support buffered the impact of disease on depression. Social support, besides having a main effect, reduced the effect of disease on depression as the interaction of disease and social support. Among those with heart disease, the set of significant predictors for men, women, and men and women was extremely stable and every case included total disease, exercise, other social support, and spousal support. The findings are shown in Figure 1.

The focus of this study was to provide clinically meaningful information to guide in the selection of appropriate therapeutic interventions for individuals presenting for treatment. Therefore, it became apparent that focusing on a broad disease construct that was typical of middle aged/older adults would be more beneficial than to focus on a single, narrow diagnostic category such as heart disease. The constructs of heart disease and other diseases were combined into a total disease construct. The total disease construct was biased in the direction of heart disease. The total disease was developed to provide a more accurate estimate of health functioning that could be applied more readily in clinical practice. This study attempted to identify relevant factors that could guide clinical interventions with older adults with health problems. Among an older population it is not uncommon for individuals to have multiple health problems rather than one very severe problem. The use of total disease allows this study to provide guidance and recommendations for treatment implications in older, married adults with chronic health problems.

The total disease included heart disease related items and other disease related items. The heart disease was designed as a continuum ranging from very mild (i.e. high blood pressure) to very severe (i.e. congestive heart failure, recent surgery, and recent myocardial infarction). Other disease was also designed as a continuum of various diseases that a person had received treatment for in the past year. However, the range of the other disease construct was higher than was the heart disease construct. It is believed that heart disease was a less powerful predictor due to this restriction in range. There were significant differences between men and women's level of heart disease and other disease that also factored into to the decision to combine heart disease and other disease into a single construct, total disease. The total disease construct includes multiple chronic illnesses such as heart disease, congestive heart failure, arthritis, chronic pain,

cancer, lung disease, stroke, asthma, arthritis, back problems and other disorders. Given the larger number of diagnoses included in this construct, those with a higher score likely have more functional impairment and have more illness stress related to multiple diverse health problems. People who have multiple health problems likely have more complicated health regimes, more frequent doctor's appointments, and increased medical procedures.

Analyses that included all participants with and without heart disease had an increased range. Heart disease was an additional but weak predictor for all participants and for men; however, heart disease was not a predictor for women. Although level of heart disease was a less strong predictor than other disease, this may have been due to the population being purposely limited to a sample where at least one member of a couple had some level of heart disease. As noted in the results section, men had a higher level of heart disease than did women. This may have been due to women having some level of heart disease that has not been discovered or that women have better health maintenance behaviors than do men. Additionally, there may be some individuals who have heart disease and have not been diagnosed or are not currently receiving medical treatment.

The preliminary analyses were attempted with heart disease alone but total disease was found to be a more meaningful construct for men and women. Total disease was the strongest predictor of depression, followed by other social support and spousal social support. Exercise and cigarette use were also significantly related to depression. This pattern was consistent across all regression models including those with only men, only women, men and women with heart disease, men with heart disease and women with heart disease.

The findings are consistent with previous studies demonstrating a strong relationship between health, social support and depression. Smith and Ruiz (2002) report depression predicts

future coronary events, even after controlling for disease state and health maintaince behaviors. Depression has been associated with increased current health problems and greater functional impairment among heart disease patients (Bodenmann et al., 2004). This association becomes more important, as approximately half of all heart disease patients have depression (Holahan et al., 1995). It is unclear the exact directionality of the relationship between heart disease and depression and which diagnosis may precede the other. However, these findings indicate the importance of performing depression screen on all cardiac patients and providing them with education about the impact of depression on heart disease. For those with moderate to severe levels of depression psychotropic medication and brief individual psychotherapy may be beneficial. Schwartzman and Glaus (2000) report that antidepressant medications may be beneficial to both psychological and physical functioning in that they reduce heart rate, reduce heart rate variability, and enhance parasympathetic tone.

Spousal Support

This study hypothesized that spousal support would have a significant impact on the relationship between cardiovascular disease and depression. The findings suggest that spousal support and other social support are protective factors against depression. Both spousal support and other social support measures were entered as the third step in the regression models, even though they were entered third, their betas were second and third behind the measure of total disease. These findings on social support are more significant when considering that by dividing the social support construct we restricted the range. Social support was divided into two scales, calculating spousal support and other social support. Dividing this scale into two constructs did restrict the range; however, we still found a strong relationship between social support and depression. These findings along with the limited number of items on the social support measure

suggest that if a full range of items, which covered the domain more completely, were used; social support may have had an even stronger impact on depression. These findings support the importance of spousal and other social support for individuals with a broad array of chronic diseases such as heart disease.

This study separated the impact of other social support from spousal social support. Both forms of social support were more important than exercise for both men and women with heart disease. Men and women with heart disease reported significantly less spousal support and other social support than did men and women with no heart disease. This is an interesting finding that may have several possible explanations. People with heart disease have a higher rate of depression, engage in fewer social activities, and receive less social support. A past or current diagnosis of depression is correlated with increased risk of heart disease (Smith & Ruiz, 2002). Therefore, these individuals may have been depressed before their diagnosis of heart disease and likely had poor social support network before their diagnosis. Research has been unable to specify which is the initial diagnosis depression or heart disease; however, given their correlational relationship there does appear to be a connection between heart disease and depression.

The results are consistent with previous studies reporting that social support has a significant effect on depression among people with chronic diseases (Hagedoorn et al., 2000). This relationship becomes more important as individuals age. As people grow older, the size and closeness of their social support network changes. The social support network decreases with increased age due to children leaving the home and retirement. Older adults tend to rely more heavily on their spouse for support (Cutrona, 1996; Shye et al., 1995). Spousal support is crucial in patients adjusting to a physical illness and has been linked to improved physiological and

psychological functioning (Sherbourne & Hays, 1990). Since older adults rely more on their spouse, this relationship becomes more important in buffering the effects of stress, such as coping with a chronic disease.

Spousal support has been associated with improved psychological and physiological functioning. Studies report that the quality of the spousal relationship can predict physical functioning and depression at a one-year follow-up (Frasure-Smith et al., 1995). Further research states that the marital relationship is associated with significant physiological changes that promote the development and progression of heart disease. That is those who report being less satisfied with their marriage was more likely to evidence heart disease progression and increased heart blockage at follow-up exams than were those who were satisfied with their marriage (Baker et al., 2003; Carels et al., 1999).

These findings provide further support for the stress buffering relationship between health, social support, and depression in an older adult population. Matt and Dean (1993) suggest that older adults are more vulnerable to depression and thus social support has a greater impact. Together these results indicate the importance of interventions aimed at educating patients and their spouses about the impact of support on depression, early signs of depression, and how depression can impact heart disease. Patient should be encouraged to identify their current support sources, alternate support sources, and to continue to stay as actively connected with their current support sources as possible. Continued involvement in church, community, volunteer activities, or a support group for people with chronic health problems could also be beneficial.

Gender Differences

This study explored differences between men and women with heart disease. Among people with heart disease, men had a higher level of heart disease and greater variability than did women. This finding is consistent with research findings that men are more frequently diagnosed heart disease than are women (Jacobs & Sherwood, 1996). Women had a higher level of other disease and an increased variability along this domain than did men. Although women had a lower heart disease score, they had a higher other disease score, suggesting that men and women had a comparable level of illness stress related to health problems. The total disease construct was developed to provide a broad disease construct that is typical of many middle aged/older adults.

Total disease was the strongest predictor of CES-D scores and social support for men and women with heart disease. Total disease was a better predictor of overall health status for both men and women than was heart disease or other disease. For men with heart disease, neither spousal social support nor other social support changed the form of the relationship between level of disease and depression. For women with heart disease, spousal social support impacted/changed the form of the relationship between level of disease and depression. The main effect of spousal social support on depression is similar for men and women with heart disease in the form of the relationship. That is, for both men and women with heart disease spousal support was a protective factor against depression.

Overall, people with heart disease reported more depression and increased other psychological problems than did those with no heart disease, indicating a possible relationship between illness stress and depression. Women with heart disease reported more depression and other psychological problems than did men with heart disease. This finding is expected and is

consistent with general trends in the population of women having an increased rate of depression. Men with heart disease smoked more cigarettes each week than did women. Men reported higher rates of alcohol use than did women. However, there were few heavy drinkers in the sample.

Correlational analyses suggest that women with heart disease benefit more from exercise than do men. Analyses between men and women show that women exercise more than men do, as this may partially explain this increased correlation. Women with heart disease had a higher level of other disease than did women with no heart disease. This suggests that women with heart disease have more general chronic health problems and this may additionally explain the higher incidence of depression and psychological distress among women with heart disease. Women reported a lower level of spousal social support than did men and women also reported a higher level of depression. This finding supports the stress buffer model and is consistent with our expectations about the differences in support provided by men and women.

Previous research reports that women generally have more friends and a closer social support network than do men. They are more likely to rely on others for support during times of stress and generally are more satisfied with their social relationships than are men (Fuhrer & Stansfeld, 2002; Tijhuis et al., 1995). Many of the studies on the social support among women report an increased reliance on sources outside of the marriage. However, as individual age, their social support systems diminish and they tend to rely more heavily on their spouse for support (Cutrona, 1996). If their spouse does not provide adequate support during a time of stress, these individuals are more likely to develop depression. These findings are further impacted by this data being composed of middle aged/older adults. This sample has an increased likelihood of having multiple health problems and having a spouse with health problems. Together these

factors suggest that older women with health problems who have low spousal support may be at significant risk for developing depression. Interventions aimed at increasing their spousal support, social support network, encouraging them to participate in social activities could be beneficial.

There were no differences between the other social support reported by men and women with heart disease. There was a difference between the spousal support provided to men and women with heart disease. Women reported significantly less spousal support than did men. This finding combined with the previously mentioned higher rate of depression among women with heart disease may provide one possible explanation for women's poorer disease outcome, worse treatment compliance and increased mortality rates following a heart related event (Jacobs & Sherwood, 1996).

Women do not receive adequate spousal support for several reasons. Women tend to be the caretakers in relationships and may spend time caring for their husband and family and neglect their own needs. This pattern becomes especially problematic when the wife has chronic health problems. Appels and Mulder (1989) coined the term "vital exhaustion" to describe the debilitated emotional state that results from caring for everyone's needs to the exclusion of your own. They describe this as an emotional and physical state of exhaustion that is characterized by feelings of helplessness and hopelessness. When women reach this state, they feel overwhelmed and have increased psychological distress and physical impairments. For women with health problems, this may have a significant impact on disease onset and progression. Feelings of hopelessness and helplessness have been associated with poorer coping efforts and increased chance of depression (Frasure-Smith et al., 1995). Another explanation is differences in the size and composition of social support networks. Fuhrer and Stansfeld (2002) report that women are

more likely to describe their closest friend as someone outside the marriage where as men described their wife as their closest friend. Throughout their lifetime, women have more close friendships outside the marriage and rely on these friends for support during times of stress (Stroebe et al., 2001). However, with increasing age, these supports become smaller and their support system may become inadequate. Women's decreased spousal support may also be related to men's adherence to gender roles. Men stereotypically function in the role of provider and may have little experience in a caretaker role. As a result, men may be uncertain how to take care of their sick wife and would not be able to provide adequate support to their wives.

Stroebe and colleagues (2001) suggest that gender differences may be related to differences in coping efforts of men and women. They report that men tend to use problem-focused coping efforts that are more effective at managing a stressor. Where as, women tend to use emotion focused coping, which is less effective. Although coping was not directly assessed in this study, previous research has found that coping efforts mediate the relationship between social support and depression (Holahan & Moos, 1995). The use of active and direct coping strategies have been associated with improved psychological and physical functioning in healthy populations and chronic illness populations (Penninx, Tilburg, Boeke, Deeg, Kriegsman, 1998; Thompson & Heller, 1990). As stress increases, these coping deficits become more pronounced and there is am increased chance of depression (Stroebe et al., 2001). Future studies should evaluate differences in coping efforts between men and women and determine how they influence health maintenance behaviors such as regular doctor visits, taking prescribed medications, and regular exercise. These studies should assess participants coping style, beliefs about coping, and health locus of control to gain a full picture of an individuals coping resources. If coping deficits are found, interventions aimed at improving coping efforts and increasing

patients' beliefs about the controllability of the situation could have significant effects on depression as well as physical health.

Study Limitations

This data is archival in nature and has some limitations. The Health and Retirement Study (HRS) is a national representative sample of adults age 51-61. The subsample used for this study consisted of married adults aged 51-71 who were currently residing with their spouse. These exclusions did restricted range; however, the focus of this study was specifically to examine the impact of some level of heart disease/total disease on depression in the context of marital functioning. Additional studies are required to elucidate the stress buffer model on unmarried individuals and with stressors unrelated to physical health. Unmarried individuals have a different social support network than married people and this would directly influence the stress buffer model. This study did not include a measure of other social support resources such as involvement in religious organizations, volunteer activities, and other community events. These activities could be significant sources of social support for unmarried middle aged/older adults. This study had a restricted age range, which may not be representative of all patients with heart disease. There are likely some significant differences between younger adults with heart disease compared to the middle aged/older adult sample used in this study.

This data was cross sectional and provided information about health, social support, and depression in a single time-period. This study was designed to provide information about the current relationship between health, support and depression and identify appropriate clinical interventions. Researchers interested in the dynamic interaction between these factors over time may use a longitudinal dataset. This type of data would allow researchers to establish a baseline of disease, social support, and depression and track changes over time. This type of study could

provide information about the changes in social support over time and how they relate to change in physical and psychological health.

The constructs of heart disease, other disease, and social support were not assessed using a validated instrument. However, steps were taken to evaluate the validity of each instrument and each was found to be an adequately valid measure. The dependent variable for this study, CES-D score, has been shown to have adequate validity and reliability in various populations (Juster & Suzman, 1995). One possible bias was that all measurements were reported by the respondents and were not independently verified by an examiner. As previously noted, participants may have health problems that were not been diagnosed and were not receiving treatment. Future studies could use medical records to independently verify participant's health status to ensure that participant's reported health problems are accurate. However, if a patient was unaware of their health problems, it is likely that they would not experiencing a great deal of illness stress and thus these results likely do provide an accurate representation of participants' illness stress.

Study Strengths

There are several strengths of this study. First, the HRS data included 7600 households and included a much larger sample size than is seen in many heart disease studies. This population was gathered as a national probability sample, with an oversample of African American and Hispanic older adults. This larger sample size enables researchers to better estimate real differences between individuals with severe health problems and others. Given the magnitude and diversity of this sample, there is greater generalizability to the overall population. Further, this sample was gathered to accurately represent an ethnically diverse population. This is a particular strength given the high number of African American individuals diagnosed with heart disease and that many studies are heavily composed of Caucasian participants. The

complete HRS Wave 1 sample consisted of 16.3% African American participants. Our sample of only married participants and their spouses where at least one partner had some level of heart disease, resulted in 11.1% African American individuals included in the sample. When the sample was further divided to include only men and women with heart disease, this resulted in 21.9 % African Americans included in the sample. These findings are consistent with previous studies. Our sample was composed of individuals who had received treating for a heart disease condition or other disease condition in the last year. People who had an undiagnosed heart disease condition and not currently receiving treatment were, by selection, excluded from the analyses involving those with heart disease. This explanation may account for the moderate number of African American participants. Schwartzman and Glaus (2000) suggests a partial explanation for the higher incidence of heart disease among African Americans is inadequate health care and engaging in fewer health maintenance behaviors than do Caucasians. Further research should be done to determine the exact nature of the relationship between health, social support, and depression among different ethnic groups.

Treatment Implications

This study has several indicators for the treatment of those with chronic health problems both at for the individual and for the marital couple. For the individual, specific education aimed at reducing high-risk behavior among individuals with preexisting risk factors or who those who have heart disease. Education about the risk factors related to heart disease such as cigarette use, heavy alcohol consumption, high fat diet, and sedentary lifestyle could significantly influence the onset and progression of heart disease. Individuals should be educated about the impact of how modifying these risk factors can significantly reduce their risk of heart disease onset and slow the progression of heart disease (Gatchel & Oordit, 2003).

Education about the role of depression in heart disease should be provided to individuals who have multiple risk factors for developing heart disease and those in the early stages of heart disease. Patients with heart disease should receive an assessment for depression by either their primary care physician or a psychologist (Shwartzman & Glaus, 2000). Specific depression symptoms of hopelessness and depressive affect are independent predictors of survival in a middle-aged heart disease population (Gatchel & Oordit, 2003). After depressed patients are identified, they could be referred to a psychoeducational group or to individual psychotherapy. Linden and colleagues (1996) performed a meta-analysis of recent studies and found that psychosocial treatments were related to significant improvements in heart disease patients. Further, they report that patients who did not receive psychosocial treatment had an increased mortality rate and higher rate of cardiac events at a two-year follow-up.

Gatchel and Oordit (2003) suggest that all heart disease patients could benefit from participation in a psychoeducational group as part of a cardiac rehabilitation treatment regime. Groups should educate patients on stress management techniques, relaxation strategies, communication skills, assertiveness training, cognitive behavioral techniques, and modification of problematic behaviors (i.e., smoking cessation, dietary changes, and exercise). Patients should be educated about the relationship between stress and heart disease and how becoming angry over small things can significantly impact on heart disease progression and fatalities related to heart disease (Kamarck & Jennings, 1991). Cognitive behavioral group treatments have been shown to be effective at reducing hostility and blood pressure in male patients with heart disease. However, additional studies are needed to assess the long-term effects of these interventions as well as their applicability to female heart disease patients (Gidron, Davidson, & Bata, 1999).

Another intervention site should be with individuals that present for psychological treatment of depression. These individuals should be educated about the symptoms of heart disease. Research indicates that a history or past depression or current depression increases the risk for developing heart disease. This becomes a more salient point when assessing women who present for the treatment of depression (Shwartzman & Glaus, 2000). Assessment of behavioral risk factors such as smoking and high fat diet as well as education about the symptoms of heart disease such as fatigue, dizziness, and fainting could be beneficial (Gatchel & Oordit, 2003). Women are often unaware of their risk of heart disease and instead believe that cancer is their greatest health risk (Jacobs & Sherwood, 1996). Many women do not seek treatment immediately for their heart disease symptoms because they are unaware of their potential risk for heart disease. When women do present for treatment, they are less likely to be diagnosed with heart disease and those who are diagnosed are less likely to receive invasive treatments or surgical procedure than are male patients (Shwartzman & Glaus, 2000). Education about the risk of heart disease in women could help women more readily identify their symptoms and seek medical treatment earlier, which could significantly impact disease progression and heart disease related mortality (Gatchel & Oordit, 2003).

These findings demonstrate a strong connection between social support and depression. Heart disease patients should be encouraged to continue to participate in social activities. Early interventions about the role of social support and spousal support in preventing depression among those with chronic health problems could be beneficial. Patients should be educated about the relationship between heart disease, social support and depression. This understanding could assist in the immediate and long-term management of depression related to heart disease. The spouses and family members of patients with heart disease could potentially benefit from

understanding this and could provide additional support. Social support groups on cardiac rehabilitation units or other similar support groups could be beneficial for both heart disease patients and their spouses.

The findings indicate treatment implications for married couples. There were strong similarities between the health behaviors of married participants and their spouses. There were similarities in broad health constructs such as heart disease and other disease levels and in specific health related behaviors such as cigarette use and exercise. Involving spouses in treatment planning and encouraging them to join spouses in healthy behavior changes likely will increase patient compliance. For example, the level of exercise among men with heart disease was correlated with their wife's level of exercise. This suggests that interventions aimed at educating spouses of people with heart disease about the potential benefits of exercise and damage associated with a poor diet, cigarette use, and excessive alcohol use could have significant effects on patient's behavior change. Given the similarities in disease trends among husbands and wives, it is likely the spouses would also benefit from these healthy behavior changes.

Tower and Kasl (1996) report similarities between depression among older husbands and wives. They suggest that the spouses of heart disease patients should also be assessed for depression. Interestingly, those in close and cohesive marital relationships appear to be at the greatest risk for depression (Baker et al., 2003). People in a close marriage likely will have a stronger reaction to their spouse's health problem and they rely more on the support received from their spouse (Tower & Kasl, 1995). Providing education to the spouses about the course of heart disease and the relationship between caregiver strain and depression could be helpful. The encouragement of both the patient and the spouse's involvement in social activities and support

groups could also be beneficial. Individual or marital counseling may be appropriate to help partners adjust to changes in their relationship related to heart disease. Therapy could also assist in adjusting to other life changes related to heart disease such as loss of income or loss of independence.

This study provides clear treatment recommendations for psychologists and medical providers treating patient with heart disease and their family. The inclusion of related psychosocial and psychoeducational treatments would provide a more comprehensive treatment for cardiovascular rehabilitation patients. Screening current heart disease patients for depression could assist in identifying those who need additional treatment such as a psychoeducational group or individual psychotherapy. Providing depressed heart disease patients with education could significantly reduce their future physical and psychological problems, which would also reduce their future utilization of medical services. Involving spouses in treatment planning will likely increase treatment compliance with behavioral changes such as diet, exercise, smoking and increased social activities. Implementation of these treatment recommendations would assist heart disease patients significantly and provide them with a more complete treatment. This type of treatment could significantly improve the psychological, physical, and marital functioning for patients with heart disease. Future studies should assess the long-term effects of this type of cardiovascular rehabilitation program as well as the effects of early depression screenings and education about heart disease risk factors.

Table 1

Gender and race distribution for all participants in the complete HRS Wave

	Married Couples		Non-Married Participants		Total	
	N	%	N	%	N	%
Gender						
Male	5125	49.9%	741	31.2%	5866	48.4%
Female	5149	50.1%	1632	68.8%	6781	53.6%
Race						
Caucasian	8022	78.0%	1394	58.7%	9416	74.4%
African American	1328	12.9%	736	31.0%	2064	16.3%
Hispanic American	931	9.1%	243	10.2%	1174	9.3%
Total	10281	100.0%	2373	100.0%	12654	100.0%

Adapted from Juster & Suzman, 1995 and Forjaz, 2000.

Table 2

Gender differences of continuous variables

Demographics	All Participants (N = 5714)		Men (n = 2857)		Women (n = 2857)		Gender Differences	
	Mean	SD	Mean	SD	Mean	SD	t	p
Age (yrs) (range= 51-71)	57.68	4.28	59.16	4.50	56.21	3.50	17.54	.000
Highest Education (range= 8- 17 years)	12.06	3.20	12.05	2.90	12.06	3.50	1.17	.240
Level of Heart Disease (range= 0-14)	1.33	2.06	1.61	2.35	1.04	1.67	10.68	.000
Level of Other Disease (range= 0-21)	3.24	3.06	3.19	3.31	3.65	3.57	.44	.664
Self-reported Psychiatric Problems (range= 0-9)	2.66	1.41	2.53	1.31	2.78	1.51	-6.62	.000
Cigarette packs a day (range= 0- 5 packs a week)	.22	.42	.26	.57	.20	.45	2.70	.007
Alcohol Use (range= 0 - 5 drinks or more a day)	.82	.84	.97	.93	.66	.70	14.59	.000

Note: All items are self-report.
[1] Calculations of these measures is described in method section and are item means.

Table 3

Continuous variables for men and women with heart disease

Demographics	All Participants (N = 2859)		Men (n = 1433)		Women (n =1156)		Gender Differences	
	Mean	SD	Mean	SD	Mean	SD	t	p
Age (yrs) (range= 51-71)	58.32	4.34	59.59	4.52	56.72	3.51	17.91	.000
Highest Education (range= 8- 17 years)	11.89	3.24	11.96	3.42	11.80	3.01	1.03	.304
Level of Heart Disease (range= 0-14)	2.94	2.16	3.23	2.42	2.58	1.72	7.72	.000
Level of Other Disease (range= 0-21)	4.21	3.77	3.87	3.61	4.66	3.92	-5.31	.000
Self-reported Psychiatric Problems (range= 0-9)	2.89	1.51	2.77	1.40	3.05	1.61	-4.71	.000
Cigarette packs a day (range= 0 – 5 packs a week)	.20	.49	.22	.53	.17	.43	2.94	.003
Alcohol Use (range= 0 to 5 drinks a day)	.81	.87	.96	.95	.61	.70	10.46	.000

Note: All items are self-report.
[1] Calculations of these measures is described in method section and are item means.

Table 4

Gender differences of for all participants scale scores

Scale	All Participants			Men			Women			Gender Differences	
	Mean	SD	Alpha	Mean	SD	Alpha	Mean	SD	Alpha	t	p
CES-D	1.39	1.51	.82	1.35	.68	.79	1.43	.67	.84	-7.97	.000
Social Support	21.61	2.33	.69	21.77	2.21	.68	21.46	2.46	.69	5.14	.000
Exercise	6.23	4.86	.47	4.86	6.40	.45	6.07	2.18	.48	5.58	.000

Table 5
Differences between Participants with and without Heart Disease

	Participants without Heart Disease (N= 3125)		Participants with Heart Disease (N= 2589)		Differences	
	Mean	SD	Mean	SD	t	p
Other Disease	2.76	3.00	4.22	3.77	-15.95	.000
Cigarette Use	.25	.53	.20	.49	3.85	.000
Alcohol Use	.83	.81	.80	.87	1.05	.293
Exercise	3.17	1.09	3.05	1.11	4.16	.000
CES-D	1.35	.35	1.44	.39	-9.37	.000
Other Psychological Problems	2.46	1.31	2.89	1.51	-11.39	.000
Total SS	21.74	2.26	21.47	2.43	4.24	.000
Other SS	13.80	1.61	13.64	1.67	3.81	.000
Spousal SS	7.93	1.07	7.83	1.16	3.31	.000

Note: All items are self-report.
[1] Calculations of these measures is described in method section and are item means.

Table 6
Correlational Table for All Participants (N= 5714)

	Other Psych.	SS	SS Other	SS Spous	Heart Disease	Other Disease	Exer.	Alcohol Use	Cigarette Packs
CES-D Correlation Sign	.585 .000	-.403 .000	-.353 .000	-.327 .000	.160 .000	.392 .000	-.211 .000	-.069 .000	.084 .000
Other Psychiatric Correlation Sign		-.330 .000	-.293 .000	-.262 .000	.180 .000	.336 .000	-.187 .000	-.108 .000	.065 .001
Social Support Correlation Sign			.896 .000	.781 .000	-.061 .001	-.144 .000	.128 .000	.016 .392	-.034 .065
SS Other Correlation Sign				.422 .000	-.051 .007	-.137 .000	.124 .000	.002 .910	-.028 .128
SS Spousal Correlation Sign					-.053 .004	-.102 .000	.087 .000	.030 .112	-.030 .106
Heart Disease Correlation Sign						.312 .000	-.108 .000	-.075 .000	.029 .127
Other Disease Correlation Sign							-.194 .000	-.106 .000	.066 .000
Exercise Correlation Sign								.130 .000	-.095 .000
Alcohol Correlation Sign									.137 .000

Table 7

Correlational Table for Participants and Spouses (N= 5714)

	CES-D	Spouse CES-D	Spousal Support	Spouse's report of SP	SS Other	Spouse's report of OS	Heart Disease	Sp Heart Disease
CES-D	1.00	.227	-.302	-.127	-.351	-.119	.122	.048
Sp CES-D	.227	1.00	-.066	-.021	-.047	-.032	.190	.088
Sp Support	-.302	-.210	1.00	.418	.398	.207	-.010	-.038
Sp report of SP	-.344	-.127	.418	1.00	.446	.166	-.015	-.038
SS Other	-.351	-.199	.398	.166	1.00	.367	-.033	.013
Sp report of OS	-.345	-.119	.446	.207	.372	1.00	-.010	.002
Heart Disease	.122	.049	-.010	-.038	-.033	.002	1.00	.114
Sp Heart Disease	.190	.048	-.015	-.038	-.010	-.013	.049	1.00
Other Disease	.403	.103	-.090	-.033	-.130	-.049	.259	.110
Sp Other Disease	.361	.218	-.077	-.079	-.105	-.081	.337	.114
Exercise	-.225	-.074	.063	.054	.043	.016	-.113	-.122
Sp Exercise	-.197	-.097	.053	.054	.089	.043	-.103	-.090
Cigarette Use	.085	.058	-.021	-.066	-.032	-.047	.024	.078
Sp Cigarette Use	.044	.062	-.007	-.059	-.002	-.007	-.029	.023

Table 8

Correlational Table for Respondents with Heart Disease

	CES-D	Spouse CES-D	Spousal Support	Spouse's report of SP	SS Other	Spouse's report of OS	Heart Disease	Sp Heart Disease
CES-D	1.00	.243	-.325	-.332	-.343	-.138	.134	.067
Sp CES-D	.243	1.00	-.332	-.175	-.182	-.346	.087	.162
Sp Support	-.325	-.214	1.00	.421	.448	.212	-.009	-.025
Sp report of SP	-.175	-.338	.421	1.00	.206	.180	-.042	-.038
SS Other	-.343	-.182	.448	.206	1.00	.438	.036	-.028
Sp report of OS	-.138	-.346	.212	.438	.375	1.00	-.005	-.008
Heart Disease	.134	.087	-.009	-.025	-.036	-.028	1.00	.033
Sp Heart Disease	.067	.162	-.038	-.028	.008	-.005	.033	1.00
Other Disease	.394	.119	-.099	-.082	-.112	-.101	.265	.288
Sp Other Disease	.206	.335	-.066	-.057	-.061	-.052	.121	.097
Exercise	-.222	-.093	.057	.065	.061	.066	-.106	-.090
Sp Exercise	-.106	-207	.045	.041	.027	.024	-.060	-.056
Cigarette Use	.084	.054	-.039	-.051	-.030	-.038	.015	-.016
Sp Cigarette Use	.070	.073	-.045	-.071	-.035	-.032	.044	.044

Table 9

Correlational Table for Men with Heart Disease (N= 1433)

	CES-D	Spouse CES-D	Spousal Support	Sp report of SP	SS Other	Spouse's report of OS	Heart Disease	Sp Heart Disease
CES-D	1.00	.260	-.288	-.328	-.336	-.338	.179	.150
Sp CES-D	.260	1.00	-.207	-.189	-.183	-.161	.071	.089
Sp Support	-.288	-.328	1.00	.460	.468	.421	-.038	-.039
Sp report of SP	-.189	-.207	.382	1.00	.202	.229	-.046	-.030
SS Other	-.336	-.338	.468	.202	1.00	.384	-.049	.307
Sp report of OS	-.189	-.183	.229	.421	.384	1.00	-.001	-.004
Heart Disease	.179	.150	-.038	-.039	-.004	-.010	1.00	.077
Sp Heart Disease	.089	.071	-.038	-.046	.049	-.001	.077	1.00
Other Disease	.390	.350	-.053	-.093	-.070	-.093	.288	-.010
Sp Other Disease	.231	.119	-.056	-.078	-.027	-.048	.123	.077
Exercise	-.192	-.214	.010	.073	.004	.108	-.124	-.103
Sp Exercise	-.066	-.113	.043	.044	.016	.038	-.057	-.066
Cigarette Use	.120	.046	-.039	-.025	-.057	-.013	.003	-.020
Sp Cigarette Use	.024	.064	-.046	-.073	-.013	-.038	.052	.037

Table 10

Correlational Table for Women with Heart Disease

	CES-D	Spouse CES-D	Spousal Support	Spouse's report of SP	SS Other	Spouse's report of OS	Heart Disease	Sp Heart Disease
CES-D	1.00	.243	-.325	-.332	-.343	-.138	.134	.067
Sp CES-D	.243	1.00	-.332	-.175	-.182	-.346	.0	.162
Sp Support	-.325	-.214	1.00	.421	.448	.212	-.009	-.025
Sp report of SP	-.175	-.338	.421	1.00	.206	.180	-.042	-.038
SS Other	-.343	-.182	.448	.206	1.00	.438	.036	-.028
Sp report of OS	-.138	-.346	.212	.438	.375	1.00	-.005	-.008
Heart Disease	.134	.087	-.009	-.025	-.036	-.028	1.00	.033
Sp Heart Disease	.067	.162	-.038	-.028	.008	-.005	.033	1.00
Other Disease	.394	.119	-.099	-.082	-.112	-.101	.265	.288
Sp Other Disease	.206	.335	-.066	-.057	-.061	-.052	.121	.097
Exercise	-.222	-.093	.057	.065	.061	.066	-.106	-.090
Sp Exercise	-.106	-207	.045	.041	.027	.024	-.060	-.056
Cigarette Use	.084	.054	-.039	-.051	-.030	-.038	.015	-.016
Sp Cigarette Use	.070	.073	-.045	-.071	-.035	-.032	.044	.044

Table 11

Regression Models for All Participants with and without Heart Disease Predicting CES-D (N= 5714)

Model	R	Adjusted R^2	R^2 change	dfs	F	Sig. F Change	Standardized Beta
1 Total Disease	.361	.130	.130	1, 5713	853.57	.000	.286
2 M1+ Exercise + Cigarette Packs	.390	.151	.022	3, 5710	340.48	.000	-.112 .042
3 M2 + Other SS+ Spousal SS	.520	.270	.119	5, 5708	423.76	.000	-.214 -.187
M4 M3 + Interactions TD X Other SS TD X Spousal SS	.523	.273	.003	7, 5706	307.65	.000	-.036 -.033

Model 1: Total Disease
Model 2: Total Disease, Exercise, Cigarette Pack
Model 3: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support
Model 4: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support, Interactions (Total Disease X Other SS, Total Disease X Spousal SS)

Note: R^2 change and significant F change is comparison with the model above. Standardized Betas shown are all from final model, Model 6, and are shown next to model where related variables were entered. For Total Disease, Other Social Support, and Spousal Support variable entered was the z-score transformations, which were then multiplied to form the four interaction terms.

Table 12

Regression Models for All Men with and without Heart Disease Predicting CES-D (N= 2857)

Model	R	Adjusted R^2	R^2 change	df's	F	Sig. F Change	Standardized Beta
1 Total Disease	.379	.144	.144	1, 2855	479.60	.000	.312
2 M1+ Exercise + Cigarette Packs	.403	.161	.018	3, 2853	184.20	.000	-.102 .050
3 M2 + Other SS+ Spousal SS	.522	.272	.111	5, 2851	214.01	.000	-.222 -.164
M4 M3 + Interactions TD X Other SS TD X Spousal SS	.526	.274	.003	7, 2849	155.34	.000	-.047 -.020

Model 1: Total Disease
Model 2: Total Disease, Exercise, Cigarette Pack
Model 3: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support
Model 4: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support, Interactions (Total Disease X Other SS, Total Disease X Spousal SS)

Note: R^2 change and significant F change is comparison with the model above. Standardized Betas shown are all from final model, Model 6, and are shown next to model where related variables were entered. For Total Disease, Other Social Support, and Spousal Support variable entered was the z-score transformations, which were then multiplied to form the four interaction terms.

Table 13

Regression Models for All Women with and without Heart Disease Predicting CES-D (N= 2857)

Model	R	Adjusted R^2	R^2 change	dfs	F	Sig. F Change	Standardized Beta
1 Total Disease	.355	.126	.126	1, 2855	411.65	.000	.275
2 M1+ Exercise + Cigarette Packs	.387	.149	.024	3, 2853	167.41	.000	-.108 .049
3 M2 + Other SS+ Spousal SS	.518	.267	.118	5, 2851	208.59	.000	-.213 -.188
M4 M3 + Interactions TD X Other SS TD X Spousal SS	.521	.269	.003	7, 2849	151.42	.000	-.028 -.041

Model 1: Total Disease
Model 2: Total Disease, Exercise, Cigarette Pack
Model 3: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support
Model 4: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support, Interactions (Total Disease X Other SS, Total Disease X Spousal SS)

Note: R^2 change and significant F change is comparison with the model above. Standardized Betas shown are all from final model, Model 6, and are shown next to model where related variables were entered. For Total Disease, Other Social Support, and Spousal Support variable entered was the z-score transformations, which were then multiplied to form the four interaction terms.

Table 14
Regression Models for All Men and Women with Heart Disease Predicting CES-D (N= 2589)

Model	R	Adjusted R^2	R^2 change	dfs	F	Sig. F Change	Standardized Beta
1 Total Disease	.369	.136	.136	1, 2587	406.66	.000	.291
2 M1+ Exercise + Cigarette Packs	.397	.157	.022	3, 2585	161.27	.000	-.128 .037
3 M2 + Other SS+ Spousal SS	.528	.277	.121	5, 2583	199.20	.000	-.202 -.162
M4 M3 + Interactions TD X Other SS TD X Spousal SS	.532	.281	.004	7, 2581	145.23	.000	-.026 -.063

Model 1: Total Disease
Model 2: Total Disease, Exercise, Cigarette Pack
Model 3: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support
Model 4: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support, Interactions (Total Disease X Other SS, Total Disease X Spousal SS)

Note: R^2 change and significant F change is comparison with the model above. Standardized Betas shown are all from final model, Model 6, and are shown next to model where related variables were entered. For Total Disease, Other Social Support, and Spousal Support variable entered was the z-score transformations, which were then multiplied to form the four interaction terms.

Table 15

Regression Model for All Men with Heart Disease Predicting CES-D (N= 1433)

Model	R	Adjusted R^2	R^2 change	dfs	F	Sig. F Change	Standardized Beta
1 Total Disease	.376	.141	.142	1, 1431	235.64	.000	.313
2 M1+ Exercise + Cigarette Packs	.397	.156	.016	3, 1429	89.39	.000	-.101 .068
3 M2 + Other SS+ Spousal SS	.520	.268	.112	5, 1427	105.71	.000	-.215 -.140
M4 M3 + Interactions TD X Other SS TD X Spousal SS	.523	.269	.003	7, 1425	76.46	.000	-.040 -.032

Model 1: Total Disease
Model 2: Total Disease, Exercise, Cigarette Pack
Model 3: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support
Model 4: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support, Interactions (Total Disease X Other SS, Total Disease X Spousal SS)

Note: R^2 change and significant F change is comparison with the model above. Standardized Betas shown are all from final model, Model 6, and are shown next to model where related variables were entered. For Total Disease, Other Social Support, and Spousal Support variable entered was the z-score transformations, which were then multiplied to form the four interaction terms.

Table 16

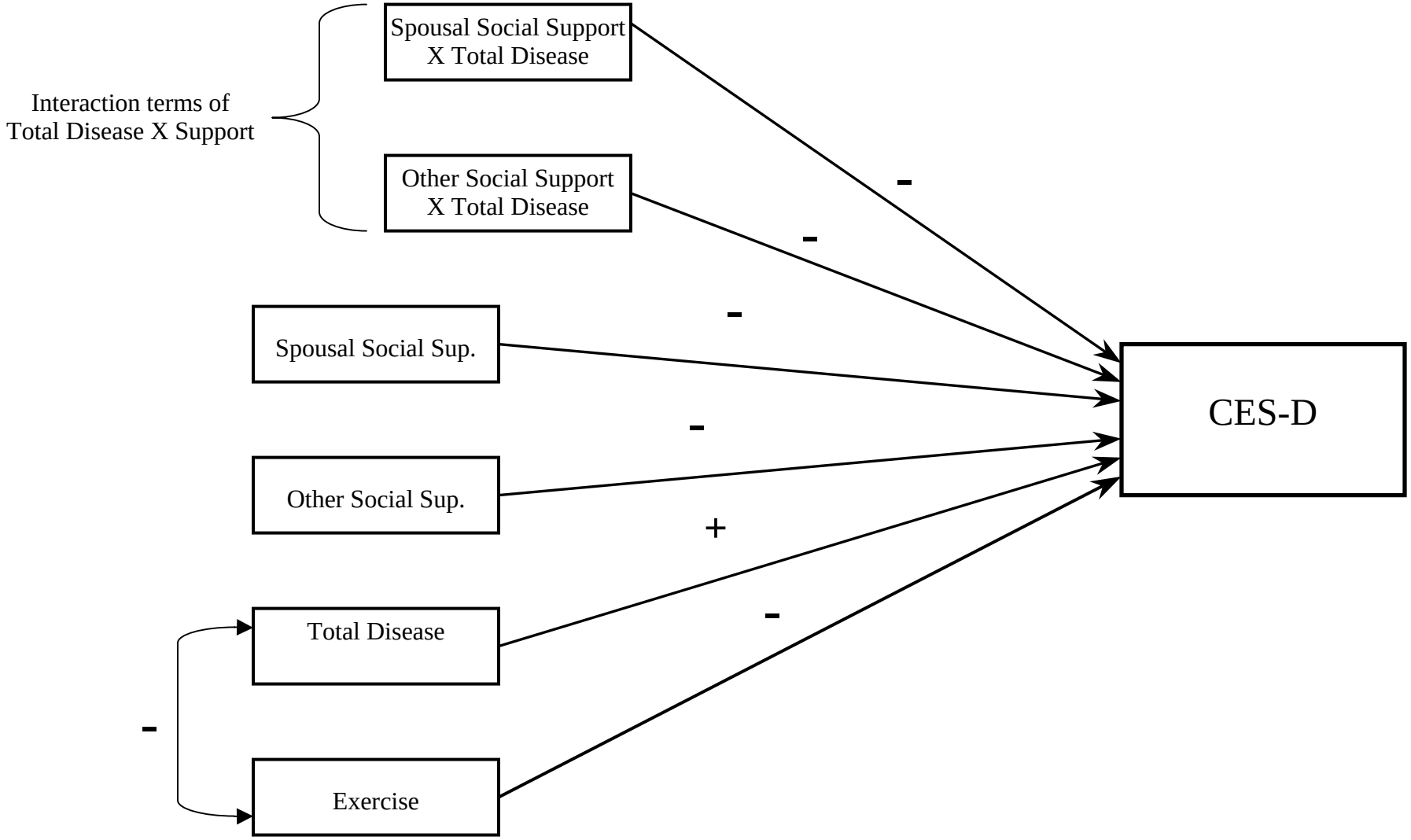
Regression Models for All Women with Heart Disease Predicting CES-D (N= 1156)

Model	R	Adjusted R^2	R^2 change	dfs	F	Sig. F Change	Standardized Beta
1 Total Disease	.366	.133	.134	1, 1154	178.10	.000	.275
2 M1+ Exercise + Cigarette Packs	.403	.160	.029	3, 1152	74.55	.000	-.140 .014
3 M2 + Other SS+ Spousal SS	.529	.277	.118	5, 1150	89.49	.000	-.195 -.156
M4 M3 + Interactions TD X Other SS TD X Spousal SS	.536	.283	.007	7, 1148	65.98	.000	-.008 -.098

Model 1: Total Disease
Model 2: Total Disease, Exercise, Cigarette Pack
Model 3: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support
Model 4: Total Disease, Exercise, Cigarette Pack, Other Social Support, Spousal Support, Interactions (Total Disease X Other SS, Total Disease X Spousal SS)

Note: R^2 change and significant F change is comparison with the model above. Standardized Betas shown are all from final model, Model 6, and are shown next to model where related variables were entered. For Total Disease, Other Social Support, and Spousal Support variable entered was the z-score transformations, which were then multiplied to form the four interaction terms.

Figure 1 – Path Model Showing Main Effects and Interactions



APPENDIX A

HRS WAVE 1 SURVEY:

QUESTIONS USED FOR THIS STUDY

DEMOGRAPHIC BACKGROUND

A1. First, I have some questions about your background. In what month, day, and year were you born?

A2. What is the highest grade of school or year of college you completed?

A7. Do you consider yourself Hispanic or Latino?

A8. Do you consider yourself primarily white or Caucasian, Black or African American, American Indian, or Asian?

A10. Please remind me, are you currently married, living with a partner, separated, divorced, widowed, or never have been married?

A42. Where does your spouse currently reside?

PHYSICAL HEALTH AND FUNCTIONING

HEART DISEASE

B6b. Do you have high blood pressure or hypertension at the present time?

B16. Has a doctor ever told you that you had a heart attack, coronary heart disease, angina, congestive heart failure, or other heart problem?

B16a. Did you ever have a heart attack or myocardial infarction?

B16b. In what year did you have your last heart attack or myocardial infarction?

B17. Do you currently have angina or chest pain due to your heart?

B17a. Are you taking any medications because of your chest pain?

B18. Has our doctor ever told you that you had congestive heart failure?

B18a. Are you currently raking medications for this?

B18b. Does your congestive heart failure sometimes cause you to be weak or short of breath?

B19. In the last 12 months, have you seen a doctor for any of your heart problems?

B20. Have you ever had a special test or treatment of the heart where tubes were inserted into your veins or arteries (cardiac catherization, coronary angiogram or angioplasty)?

B21. Have you ever had surgery on your heart?

OTHER DISEASE

Diabetes

B7c. Do you have diabetes now?

B7d. During the last 12 months, have you seen a doctor for diabetes?

B8c. Are you using medication to control your diabetes?

B8d. Are you using insulin injections to control your diabetes?

Cancer

B9. Has a doctor ever told you that have cancer or a malignant tumor of any kind except skin cancer?

B12. During the last 12 months, have you seen a doctor about this cancer?

B13. During the last 12 months, have what sorts of treatment have you received for this cancer?

A. Chemotherapy/ Medication B. Surgery/Biopsy

C. Radiation/ X-Ray D. Other

E. None

Lung Disease

B15. Not including asthma, has a doctor ever told you that you have chronic lung disease such as chronic bronchitis or emphysema?

B15d. Does your condition limit your usual work activities such as household chores or going to work?

Stroke

B22. Has a doctor ever told you that you had a stroke?

B22c. During the last 12 months, have you seen a doctor because of your stroke?

B22d. Are you taking any medications because of your stroke and its complications?

Arthritis

B25. Have you ever had or has a doctor told you that you have arthritis or rheumatism?

B25a. Do you sometimes have pain, stiffness, or swelling in your joints?

B25b. Are you currently taking any medication or other treatments for your arthritis or rheumatism?

B25c. During the last 12 months, have you seen a doctor specifically for your arthritis or rheumatism?

Other health problems

B26. Do you have any of the following problems?

A. Asthma B. Problems with your back

C. Problems with your feet and legs D. Kidney or bladder problems

E. Stomach or intestinal problems F. High cholesterol

Pain

B29. Are you often troubled by pain?

B29b. How bad is the pain most of the time: mild, moderate, or severe?

PSYCHOLOGICAL FUNCTIONING

OTHER PSYCHOLOGICAL PROBLEMS

B3. What about your emotional health- how good do you feel now or how stressed, anxious, or depressed do you feel? Is it excellent, very good, good, fair or poor?

B23. Has a doctor ever told you that you had emotional, nervous or psychiatric problems?

B24. During the last 12 months, have you had any emotional, nervous, or psychiatric problems?

B24a. Do you now get psychiatric or psychological treatment for your problems?

B24b. Do you now use tranquilizers, antidepressants or pills for nerves?

HEART DISEASE/DEPRESSION RELATED BEHAVIORS

Cigarette Use

B35a. Do you smoke cigarettes now?

B35b. About how many cigarettes or packs do you usually smoke in a day now?

Alcohol Use

B36. Do you ever drink any alcoholic beverages such as beer, wine, or liquor?

B36a. In general, do you have les than one drink a day, one to two drinks a day, three or four drinks a day, or five or more drinks a day?

Exercise

B38. The next few questions are about exercise. Looking at the answer categories at the bottom of page 1, how often do you participate in light physical activity—such as walking, dancing, gardening, golfing, bowling, etc.? (Would you day 3 or more times a week, 1 or 2 times a week, 1 to 3 times a month, less than once a month, or never?)

B39. How often do you participate in vigorous physical exercise or sports – such as aerobics, running, swimming, or bicycling?

B40. How often do you do heavy housework like scrubbing floors or washing windows?

E133. Now, looking at the bottom of page 3 of the booklet, please tell me how satisfied or dissatisfied you are with various aspects of your life at the current time. Are you very satisfied, somewhat satisfied, about evenly satisfied and dissatisfied, somewhat dissatisfied, or very dissatisfied…

Other Social Support

E133b. How satisfied are you with your neighborhood where you live?

E133e. How satisfied are you with your friendships?

E133h. How satisfied are you with your family life?

Spousal Support

E133f. How satisfied are you with your marriage?

E136. Generally speaking would you say that the time you spend with your (husband/wife) is extremely enjoyable, very enjoyable, somewhat enjoyable, or not too enjoyable?

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