# THE RELATIONSHIPS AMONG PERCEIVED CORONARY HEART DISEASE RISK, DEPRESSION, HEALTH PREVENTIVE BEHAVIORS, AND CORONARY HEART DISEASE KNOWLEDGE IN OLDER WOMEN

By

KRYSTA LYNETTE WEBSTER

Bachelor of Science in Psychology
Wofford College
Spartanburg, South Carolina
2003

Master of Arts in Clinical Psychology
Western Carolina University
Cullowhee, North Carolina
2005

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Dissertation Approved:

Dr. Sue C. Jacobs

Dissertation Adviser

Dr. Julz Dorton Clark

Dr. Steve Harrist

Dr. Valerie McGaha

Dr. Michael Pollak

Outside Committee Member

Dr. Mark E. Payton

Dean of the Graduate College

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# CHAPTER I

# THE RELATIONSHIPS AMONG PERCEIVED CORONARY HEART DISEASE RISK, DEPRESSION, HEALTH PREVENTIVE BEHAVIORS, AND CORONARY HEART DISEASE KNOWLEDGE IN OLDER WOMEN

Heart disease is a continuing problem today in American women (American Heart Association, 2007a). According to the American Heart Association (AHA; 2007b), 39% of female deaths in the U. S. result from cardiovascular diseases, including stroke and coronary heart disease (CHD). Cardiovascular diseases also represent the number one disease in hospital discharges for women (AHA, 2007b). Even more striking is that in 2005, cardiovascular disease claimed more lives than cancer in women, with 454, 613 deaths to cardiovascular diseases and 268,890 deaths to cancer (AHA, 2009).

The most common type of cardiovascular diseases is CHD (i.e., failure of adequate coronary circulation to the heart muscle and surrounding tissue, often resulting in myocardial infarctions (MI) or heart attacks and angina pectoris or chest pain).

Coronary artery disease (CAD) and coronary heart disease (CHD) are used interchangeably to describe the narrowing of the heart's arteries due to a buildup of hardened plaque (atherosclerosis), containing such substances as fat deposits and cholesterol that can grow large enough to greatly decrease blood flow, causing a heart attack (AHA, 2007a).

Few researchers have examined associations among perceived risk of CHD, CHD knowledge, depression, and health preventive behaviors among older women. No researcher to date has examined these relationships in a single study. This is surprising given that, on average, women live longer than men and that people in the U. S. are living longer. In 2008, there were approximately 48 million adults 65 years of age and older. Nearly 23 million of these older adults were women (U. S. Census Bureau, 2011). It is estimated that by the year 2030, 65 to 74 year-old adults will comprise 10% of the total population, and older adults over the age of 75 will comprise nine percent (U. S. Census Bureau, 2003). The population of older adults 75 years and older is expected to exceed the 65 to 74 year-old population by the year 2040 (2003). Aging is often accompanied by physical decline and medical illnesses. As is well-known, depression is often comorbid with chronic illnesses. In fact, depression both precedes CHD and frequently occurs in the recovery from CHD-related events (Barefoot & Scholl, 1996; see also Aroma et al., 1994; Booth-Kewley & Friedman, 1987; Fielding, 1991; Hallstrom, Lapidus, Bengtsson, & Edstrom, 1986). Researchers need to examine the factors (e.g., perceptions about CHD risk, depression, CHD knowledge, and health-preventive behaviors) that will likely aid in the development of prevention programs and interventions for both women at risk or who already have a diagnosis of CHD.

**Women and CHD**

Women are more likely to die after their first heart attack than men are (Mendes de Leon et al., 1998) even when cardiovascular therapies (e.g., coronary thrombolytic therapy) are utilized (Wenger, Speroff, & Packard, 1993). The Women's Heart Foundation (2007) reported that within one year of the first heart attack, twice as many women as men will die. Yet, only 24% of women in heart-related studies have been women (Women's Heart Foundation, 2007). Historically, researchers in the cardiac psychology literature primarily used men as the participants in studies yet generalized the findings to both men *and* women (Jacobs, Schultz, & Welch, 2003; see also Bankier & Littman, 2002; Jacobs, & Stone, 1999; Jacobs, & Sherwood, 1996; Eaker, 1989). Other researchers included women but had very small samples, making it almost impossible to detect accurate differences between men and women in symptoms and prognosis of CHD (Czajkowski, Hill, & Clarkson, 1991). According to Yusuf, Zucker, and Peduzzi (1994), only 3.2% of all randomized trial studies on CHD in the 1970s and 1980s included women. Most startling was the 2004 finding that one in five physicians did not realize that more women die from all cardiovascular diseases combined than men (Mosca et al., 2004). According to Brister and Turek (2001), women account for 53.5% of cardiovascular disease deaths.

Researchers found that women have a poorer prognosis post- MI (heart attack) than men and typically suffer more from hypertension, congestive heart failure, and diabetes (Polk & Tasneem, 2005; see also Carney, Freedland, Smith, Lustman, & Jaffe 1991; Dittrich, Gilpin, Nicod, Cali, Henning, & Ross, 1988; Greenland, Reicher-Reiss, Goldbourt, & Behar, 1991). For example, women, one year post-MI, showed a more

immediate decrease in physical health than men (Schwartz et al., 1997). In a study examining gender differences in electrocardiographic (ECG) factors after the first MI in male and female patients, females showed a 38% higher risk of recurrent cardiac events than males at the two-year follow-up (Mieszczanska, Pietrasik, McNitt, Moss, & Zareba, 2008). Specifically, assessing ECG ratings five to seven days following the initial MI, women, unlike men, showed an increase in risk for a recurrent cardiac event (2008). The prevalence of CHD increases with age such that for those women between 45 and 64 years of age, the ratio of being diagnosed with CHD is one in nine, whereas in women 65 years of age and older, one in three are likely to be diagnosed with CHD (Wenger, et al., 1993).

Women also more commonly meet criteria for major depression for a greater amount of time after a heart attack in comparison to men, as well as after heart surgery (Drory, Kravetz, & Hirschberger, 2003; see also Stern, Pascale, & Ackerman, 1977). Although previous researchers identified depression as occurring either after or in response to CHD (Fielding, 1991), researchers also found that depression is a significant risk factor for CHD, as well as a predictor of CHD (Pennix et al., 2001; see also Lesperance, Frasure-Smith, & Talajic, 1996). Depression post-CHD onset is also predictive of poor outcomes (Lesperance, Frasure-Smith, & Talajic, 1996; see also Ahren et al., 1990; Carney et al., 1988; Frasure-Smith, Lesperance, & Talajic, 1993, 1995a, 1995b;). Among individuals meeting criteria for a diagnosis of depression, higher rates of death were found to be mediated by an MI (Van der Kooy et al., 2007; see also Bremmer et al., 2006). In other literature, researchers found that cardiac disease is a

moderator between depression and stroke and that individuals with both a cardiac disease and depression had higher mortality rates (Wouts et al., 2008).

**Women and Perceived Risk of CHD**

Fiandt, Pullen, and Walker (1999) found that a sample of 102 older women significantly underestimated their risk for heart disease. Other researchers found that women do not perceive their risk of a heart attack to be as great as men, particularly if women consider themselves to be healthy in terms of weight, diet, and exercise (Krueter & Stretcher, 1995). Furthermore, others reported that older women do not perceive their risk to be as great as younger women despite age being a risk factor for CHD (Moran, Maaocco, Fiscus, & Koza, 1989). Oliver-McNeil and Artinian (2002) found in a sample of 33 women with CHD that 33% of those women with hypertension did not believe that they were at risk of further CHD-related events because their blood pressure was controlled by medication. They also found in this sample that menopause, age, and lack of physical activity were not frequently identified as risk factors for CHD. These findings are distressing given that at menopause, estrogen, a hormone that likely protects women from many CHD risk factors, decreases and continues to decrease post-menopause (Mosca et al., 1997); that most women who experience new-onset CHD do so after 65 years of age (Grundy et al., 1998); and that lack of physical activity is the most common risk factor for CHD (Andaet al., 1988).

**Women and CHD Knowledge**

Additionally, many women lack knowledge about CHD. In their sample of 33 women, Oliver-McNeil and Artinian found that 67% of women did not understand the association of stress to atherosclerosis and 52% did not recognize exercise as important to

the overall functioning of the heart. They further reported that nearly half did not know about the benefits of "good cholesterol" (i.e., high-density lipoprotein) in lowering their risk of CHD (Oliver-McNeil & Artinian, 2002). Other researchers also found women's knowledge and understanding of CHD risk factors to be minimal (Poduri & Grisso, 1998; see also Czeizel, Kalina, & Williams, 1997; Zerwic, King, & Wlasowicz, 1997). In a national survey of women, Mosca, Ferris, Fabunmi, and Robertson (2004) reported that 60% did not consider themselves to be informed about CHD risk factors. Thanavaro, Moore, Anthony, Narsavage, and Delicath (2006) found in a sample of 120 women without a CHD diagnosis that they were largely unaware of stress as a risk factor for CHD and that many did not recognize that fatigue immediately following exercise is a sign of overexertion. Hamner and Wilder (2008) found in a sample of 112 women that most women correctly identified only one CHD risk factor for which they were susceptible and that these women significantly lacked correct knowledge about CHD.

**Health Behaviors**

If older women are at increased risk for depression and heart disease, it seems likely that they will take steps to increase health behaviors to promote overall psychological and physical well-being. According to the Health Belief Model (Strecher & Rosenstock, 1997; Rosenstock, 1974), a person is likely to adopt a recommended behavior if 1) She perceives herself as susceptible to getting the disease; 2) She perceives the outcomes of having the disease or condition as serious; and 3) She perceives the benefits of adopting the recommended behavior to outweigh any barriers. Thus, a woman's perceptions of the likelihood of developing CHD in her lifetime are important in whether she takes steps to promote a healthy lifestyle. However, women on average

do not perceive their risk of a heart attack to be as great as men (Krueter & Stretcher, 1995). The belief that symptoms are associated with cardiac issues has a stronger relationship to the immediate utilization of healthcare services than the belief that symptoms are not associated with cardiovascular concerns (Meischkeet al., 1995). Those individuals who perceive their risk for cardiovascular-related diseases to be higher may be more inclined to act in health-promoting ways than those who do not perceive risk to be a problem (1995).

Pender (1996) expanded the HBM through the Health Promotion Model (HPM; Pender, 1996). The HPM assumes that individuals want to promote their health in positive ways and to modify their lives accordingly. Health promotional behaviors are inclined to be maintained if individuals have a high commitment to them. In this model, an individual's likelihood to commit to lifestyle changes and to engage in health-promoting behaviors depends upon: 1) personal characteristics (i.e., cultural, biological, and psychological); 2) experiences one has had prior to health-promoting behaviors; 3) perceptions of benefits of taking action; 4) perceptions of barriers to taking action; 5) perceptions of self-efficacy; 6) affect about physical activities; 7) interpersonal influences and supports; 8) environmental influences; and 9) other demands in need of immediate action (Pender, Murdaugh, & Parsons, 2002). Although the HPM focuses less on the threat of risk as a means to health enhancement, it still relates to the HBM in that an individual who perceives risk to be high will likely take preventive steps to modify their lifestyle, thus, leading to health-enhancing behaviors.

To date, researchers have not examined the relationship of perceived risk of CHD and depression. This possible association seems important to consider given that women

have a greater prevalence for diagnoses of both depression and CHD and that women, particularly older women, do not perceive their risk of heart disease to be high despite their reported risk symptoms (e.g., age and other physical health problems;et al., 2005; Gerend, Aiken, West, & Erchull, 2004).

**Women and Depression**

Clinical depression is twice as common in women as in men (Marcus, et al., 2005; Piccinelli & Wilkinson, 2000; Bebbington, 1998; Sprock & Yoder, 1997; Wolk & Weissman, 1995; Weissmanet al., 1993; Nolen-Hoeksema, 1990, 1987; Weissman & Klerman, 1977). The prevalence rates for depression are 24% for women and 15% for men in community samples (Kessler, McGonagle, Zhao, & Nelson, 1994). Depression is also the most commonly diagnosed mental health disorder among older adults (Chan, Chien, Thompson, Chiu, & Lam, 2006) and is reported more often among older adults than younger adults (Zarit & Knight, 1996). In the late 1990's, depression was found to negatively affect the well-being of 15-20% of older adults in community and clinical samples (Gallo & Lebowitz, 1999). Since then, few studies have been conducted examining the prevalence of depression among community-dwelling older adults. Among those that do exist, samples are small. In one study from one county in Utah, the diagnosis of major depression in older adults was found to be nearly five percent in community samples of women and nearly three percent in men 65 years of age and older (Steffens, et al., 2000). More recently, researchers who examined the persistence of depression at 12 months, 24 months, and 48 months in a sample of 10,000 middle-aged and older adults found that almost four percent of adults 65 years and older met criteria for a major depressive disorder within one year and found that these depressive

symptoms persisted at the follow-up points (Mojtabai & Ofson, 2004). These researchers also found that for their sample, including both middle-age and older adults, more women than men; adults with less education; adults who were unemployed; adults with lower incomes; and adults who were separated, divorced, or widowed more commonly met criteria for a major depressive disorder.

Historically, depressive symptoms are commonly reported in women around the age of menopause, including depressed mood, insomnia, and concentration problems and among women taking hormonal therapies, such as hormone replacement therapy, hormonal contraceptives, and infertility medications (Kornstein & Parker, 1997). Researchers report that somatic symptoms are more frequently reported in women with depression than men with depression (Kornstein et al., 2000; Nolan & Wilson, 1994; Silverstein, 1999). Researchers found that older women more typically report appetite disturbances than men (Kockler & Heun, 2002). Specifically, researchers have found that atypical, somatic depressive symptomatology, including increased appetite, sleep, and hypochondriasis were more prominent in women than in men (Kornstein et al., 2000; Young, Scheftner, Fawcett, & Klerman, 1990). More recently, researchers found in a four-year longitudinal study that depression is more persistent in older women than in older men (Barry, Allore, Guo, Bruce, & Gill, 2008). In fact, 50% of older women perceive depression to be a normal part of aging (Mental Health of America, 2007); yet, depression is not a normal part of aging (Chapman, Perry, & Strine, 2005). In a sample of nearly 14,000 women 65 years of age and older, nearly six percent of older women met criteria for major depression, with women between 65 and 74 years of age more frequently reaching criteria than women 75 and older (McGuire, Strine, Vachirasudlekha,

Mokdad, & Anderson, 2008). Of those women between 65 and 74 years of age who met criteria for depression, 12.3% reported a lifetime prevalence of depression (2008).

From a socioeconomic standpoint, researchers found that the most commonly endorsed stressful life event among older adults is a loss of financial status (Fiske, Gatz, & Pedersen, 2003). Women are paid less than men on average (Hegewisch, Williams, & Henderson, 2011; see also Rosenfield, 1989) and often take on the majority of household tasks and childcare (Lennon & Rosenfield, 1992), which can lead to greater depression and financial problems (Rosenfield, 1989) and greater role demands (Rosenfield, 1992). Although stresses with household tasks, childcare, and employment are more commonly associated with middle-aged women and younger women, a growing number of older women and men are raising their grandchildren. In fact, one in ten U. S. children is living with their grandparent(s), and four percent are being raised by at least one grandparent (Goyer, 2010). Given that women tend to live longer than men, this parenting role is most commonly placed upon the grandmother. Further, in comparison to men and women, internationally, women tend to have less education, lower incomes, less employment in skilled occupations, and they tend to more likely be widowed (Zunzunegui, et al., 2007; Barefoot, Mortensen, Helms, Avlund, & Scholl, 2001; Sonnenbeg, Beekman, Deeg, & van Tilburg, 2000). Regardless of age, a woman with chronic illnesses like CHD encounters structural reorganization within her own life, through her limited ability to continue the roles she played prior to the medical condition and her limited capacity to respond as she once did to others' expectations; these factors may contribute to feelings of anger, depression, boredom, loneliness, and/or low self-esteem (Patterson & Garwik, 1994). Therefore, adjustment to and coping with the

illness, as well as their roles, become a major concern for women suffering from medical illnesses, such as CHD.

**Purpose of Study**

The purpose of this study was to examine possible relationships among perceived risk of CHD, CHD knowledge, health preventive behaviors, and depression in women 65 to 95 years of age. Although CHD risk factors are greater for this age range than for younger individuals (Wenger, 1996), women have only recently begun to be included in studies addressing the risk factors for CHD, and many of the studies including women do not include women 65 years of age and older.

Although a well-established body of literature exists regarding the association between depression and CHD, no researchers to date have looked at the relationship between depression and *perceived* heart disease risk among older women, which could have important implications for health protective behaviors given that depression often occurs prior to the onset of CHD; that is, understanding more about a potential relationship between depression and perceived heart disease risk among older women may help mental health clinicians and healthcare professionals better understand older women's beliefs about CHD risk and about depression.

**Research Questions**

The initial research questions were descriptive in nature: 1) On average, how high does this sample perceive their risk of CHD; 2) On average, how much CHD knowledge does this sample of older women have; 3) On average, do women in this sample engage in health preventive behaviors; and 4) To what extent are older women depressed in this sample (i.e., None or Minimal; Mild, Moderate, or Severe)?

Other research questions considered relationships among the variables in this study: 5) Is perceived risk of heart disease related to coronary heart disease knowledge; 6) Is perceived risk of heart disease related to engagement in health preventive behaviors; 7) Is perceived risk of heart disease related to depression; 8) Is coronary heart disease knowledge related to health behaviors; 9) Is CHD knowledge related to depression? 10) Are health preventive behaviors related to depression?

## Method

### Participants

Although Erikson (1963) utilized age 60 to demarcate the beginning of late adulthood, today the U. S. Census Bureau (2010) considers Americans to be "older adults" at 65. In fact, the Bureau refers to individuals 65 to 84 as the young-old and individuals 85 and older as the old-old. My sample consisted of 104 women between 65 and 95 years of age, using both young-old and old-old participants.

General descriptors about the sample, including age, race, marital status, educational status, and state of residence, are presented in Table 1. As indicated in the table, 88% of the women were young-old (i.e., 65 to 84 years of age). Most were White, widows, and from South Carolina. There was a range of educational backgrounds; however most of the women had a high school education or less, and over a third did not finish high school.

Table 1.

*Descriptive Characteristics of Sample Including Age Group, Race, Marital Status, and Education Level*

| Variable | N | % |
|---|---|---|
| Age Group | | |
| 65 – 70 | 35 | 33.7 |
| 71 – 75 | 15 | 14.4 |
| 76 – 80 | 23 | 22.1 |
| 81 – 85 | 18 | 17.3 |
| 86 – 90 | 7 | 6.7 |
| 91 – 95 | 6 | 5.8 |
| Race | | |
| White | 71 | 68.3 |
| Black or African American | 25 | 24.0 |
| American Indian or Alaskan | 2 | 1.9 |
| Asian Indian | 1 | 1.0 |
| Guamanian or Chamorro | 1 | 1.0 |
| Hispanic | 1 | 1.0 |
| Multiracial | 3 | 2.9 |
| Marital Status | | |
| Married | 32 | 30.8 |
| Cohabitating/Living Together | 2 | 1.9 |
| Divorced | 5 | 4.8 |
| Widowed | 60 | 57.7 |
| Single | 4 | 3.8 |
| Educational Status | | |

| | | |
|---|---|---|
| Did Not Finish High School | 35 | 33.7 |
| Graduated from High School or Obtained GED | 37 | 35.6 |
| Some Education after High School | 15 | 14.4 |
| Graduated from College | 12 | 11.5 |
| Master's Degree | 3 | 2.9 |
| Doctoral Degree | 1 | 1.0 |
| State of Residence | | |
| South Carolina | 87 | 83.7 |
| North Carolina | 9 | 8.7 |
| Oklahoma | 7 | 6.7 |
| Virginia | 1 | 1.0 |

On the demographics questionnaire, one question asked participants to write in their ethnicity or ancestry. Participants responded with a variety of answers, including racial categories, some ancestry or country of origin, and two participants responded with a religious affiliation. Most participants liked this question because they eagerly talked about their ancestral history. Some participants mentioned that their country of origin was the British Isles (N = 19); some identified American (N = 12), including Caucasian American (N = 1), American Indian (N = 2), and Irish American (N = 1). Five women identified their country of origin to be Africa.

As depicted below in Table 2, approximately one-fourth of the women reported a physician diagnosis of heart disease at an average age of 62 years. The age range for diagnosis of heart disease was between 30 and 91 years. Approximately half of the

participants reported that at least one of their parents had heart disease, and about half reported that other relatives had been diagnosed with heart disease.

Table 2

*Descriptives of Personal and Family History of Heart Disease*

| Variable | N | % | M | SD |
|---|---|---|---|---|
| Diagnosis of Heart Disease | | | | |
| Yes | 23 | 22.1 | | |
| No | 80 | 76.9 | | |
| Age When Diagnosed with Heart Disease | | | 62.19 | 15.64 |
| Family History of Heart Disease | | | | |
| Mother or Father | | | | |
| Yes | 53 | 51.0 | | |
| No | 49 | 47.1 | | |
| Other than Mother or Father | | | | |
| Yes | 51 | 49.0 | | |
| No | 48 | 46.2 | | |
| Do Not Know | 2 | 1.9 | | |

As shown in Table 3 with behavioral risk factors for CHD, the average frequency of weekly exercise was approximately three days (N = 26, 25% of sample). The majority (N = 28, 26.9%) reported that when they exercise, they average between 11 and 20 minutes.

Table 3

*Descriptives of Heart Disease Risk Factors, Including Exercise Time and Frequency, Tobacco Use, and Hormone Use*

| Variable | N | % | M | SD |
|---|---|---|---|---|
| Frequency of Weekly Exercise (in Days) | | | 2.97 | 1.95 |
| None | 11 | 10.6 | | |
| One | 14 | 13.5 | | |
| Two | 17 | 16.3 | | |
| Three | 26 | 25.0 | | |
| Four | 16 | 15.4 | | |
| Five | 7 | 6.7 | | |
| Six | 3 | 2.9 | | |
| Seven | 9 | 8.7 | | |
| Average Time Spent Exercising (in Minutes) | | | 21-30 | |
| Less than 10 minutes | 14 | 13.5 | | |
| 11 – 20 minutes | 28 | 26.9 | | |
| 21 – 30 minutes | 15 | 14.4 | | |
| 31 – 40 minutes | 13 | 12.5 | | |
| 41 – 50 minutes | 5 | 4.8 | | |
| 51 – 60 minutes | 2 | 1.9 | | |
| One hour | 10 | 9.6 | | |
| Number and Frequency of Participants who Smoke | | | | |
| No | 97 | 93.3 | | |
| Yes | 7 | 6.7 | | |
| Days a Week | | | 5.3 | 2.98 |
| Two | 1 | 1.0 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Daily | 5 | 4.8 | | | | |
| Number of Cigarettes | | | 12.33 | 6.12 | | |
| Use of Other Tobacco Products | | | | | | |
| No | 99 | 95.2 | | | | |
| Yes | 5 | 4.8 | | | | |
| Types of Other Tobacco Products Used | | | | | | |
| Cigars | 1 | 1.0 | | | | |
| Snuff | 4 | 3.8 | | | | |
| Hormone Usage | | | | | | |
| Yes | 13 | 12.5 | | | | |
| No | 89 | 85.6 | | | | |

Table 4 provides the descriptive statistics for health and other non-behavioral CHD risk factors reported by women in this study.

Table 4

*Descriptives of Health and CHD Risk Factors, Including Diabetes, High Blood Pressure (BP), High Cholesterol, and Weight*

| Variable | N | % | M | SD | Range Low - High | |
|---|---|---|---|---|---|---|
| Diagnosis of T2DM* | | | | | | |
| No | 90 | 86.5 | | | | |
| Yes | 14 | 13.5 | | | | |
| Average BSL* | | | 122.83 | 20.68 | | |
| Diagnosis of High BP | | | | | | |
| No | 30 | 28.8 | | | | |
| Yes | 73 | 70.2 | | | | |
| Systolic BP | | | 131.96 | 14.07 | 110 | 190 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Diastolic BP | | | 74.77 | 8.71 | 50 | 90 |
| Diagnosis of High Cholesterol | | | | | | |
| No | 41 | 39.4 | | | | |
| Yes | 61 | 58.7 | | | | |
| Overweight | | | | | | |
| No | 80 | 76.9 | | | | |
| Yes | 23 | 22.1 | | | | |
| Obese | | | | | | |
| No | 96 | 92.3 | | | | |
| Yes | 4 | 3.8 | | | | |

*Note.* *Type 2 Diabetes Mellitus (T2DM) is presented. Average blood sugar levels (BSL) are also presented.

For the total sample, most of the participants (N = 54, 51.9%) reported that they are very comfortable discussing their heart disease risk factors and concerns with their physician. Twenty-three women (22.1%) reported being mostly comfortable; 18 (17.1%) reported being somewhat comfortable; five women (4.8%) reported being a little bit comfortable; and three women (3.9%) reported that they are not at all comfortable discussing their heart-related risk factors and heart disease concerns with their physician. Additionally, for women without CHD, 14 (17.7%) reported no knowledge about CHD facts and statistics. Twenty-six (32.9%) reported a little bit of knowledge; 20 (25.3%) reported having average knowledge; 14 (17.7%) reported some knowledge; and two women (2.2%) reported a lot of knowledge about CHD. For women with CHD, two (8.7%) reported no knowledge about CHD facts and statistics; eight (34.8%) reported a little bit of knowledge; five (21.7%) reported average knowledge; five (2.7%) reported some knowledge; and three (13.0%) reported a lot of knowledge about CHD.

For the total sample, only five (4.8%) of women identified that they have a lot of knowledge about heart disease and heart disease-related risk factors; 19 (18.3%) reported having some knowledge; 26 (25%) reported having average knowledge; and 34 (32.7%) reported having a little bit of knowledge. Interestingly, 18 women (17.3%) identified that they have no knowledge about CHD or CHD-related risk factors. For women without CHD, three women (3.8%) reported being not at all comfortable discussing CHD-related concerns; four (5.1%) reported being a little bit comfortable; 14 (17.7%) reported being somewhat comfortable; 18 (22.8%) reported being mostly comfortable; and 39 (49.8%) reported being very comfortable discussing their CHD concerns with their physician. For those women with CHD, four (17.4%) reported being somewhat comfortable; four (17.4%) reported being mostly comfortable; and 15 (65.2%) reported being very comfortable.

The frequency, percentage, means, and standard deviations of participants who reported a history of depression and anxiety are presented in Table 5.

Table 5

*History of Anxiety and Depression, Including Length of Time since Diagnosis*

| Variable | N | % | Mean | SD |
|---|---|---|---|---|
| Depression Diagnosis | | | | |
| No | 82 | 78.8 | | |
| Yes | 22 | 21.2 | | |
| Length of Time (in Weeks) | | | 251.81 | 414.04 |
| Anxiety Diagnosis | | | | |
| No | 84 | 80.8 | | |

| | | | | |
|---|---|---|---|---|
| Yes | 19 | 18.3 | | |
| Length of Time (in Weeks) | | | 98.44 | 214.41 |

In terms of social support, one question on the demographics questionnaire asked participants the following question: On average, do you feel that you talk to other people (for example, family, and friends) regularly? Participants then circled yes or no. The next question asked the following: If yes, how often do you talk to them? Participants then answered based on the following choices: Daily, weekly, or monthly. Ninety-eight (94.2%) of participants responded that they talk to others regularly. Eighty-seven (83.7%) women reported that they talk daily to others; ten (9.6%) women reported weekly; and one woman reported that she talks monthly to others.

Participants were recruited as a convenience sample of volunteers. Snowball sampling was also employed. Before recruitment began, the study was approved by the University Institutional Review Board for the protection of human participants. The final sample consisted of 103 women, as one participant was excluded from the analysis because she did not respond to most of the items on the questionnaires (see Appendix S, Participant 69 for description of this woman).

**Procedure**

Participants were recruited at primary care settings, adult day living centers, churches, through family and friends' homes with general information and a flier (See Script for Recruitment for Flier in Appendix Q). Furthermore, advertisements (See Appendix P for Script for Newsletters) were placed in church newsletters and the flier was posted (Appendix Q for Flier) in churches, adult day centers, hospitals, and universities.

Interested older women scheduled an appropriate place and time to meet with me, such as at their home, an adult day center, a church, or an activity room at a retirement community. I then met with the participants individually to answer questions and obtain their consent. Initially, possible participants were then screened (See Appendix B for Screening Questions) to identify potential participants for a related study (See Supplemental Qualitative Analyses section). I created these screening questions to identify older women who were diagnosed with either CHD or high risk for CHD and a current or past diagnosis of clinical depression. In addition to filling out questionnaires, the first eight participants who qualified were invited to participate in an interview for the related study.

The Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) was administered to all potential participants to examine their cognitive ability to participate in this study. The MMSE is an 11- item screening instrument that assesses orientation to time and place, recall, short-term memory, and arithmetic ability (Folstein, 1998, 1975) with an excellent internal consistency of alpha coefficient .96 (Foreman, 1987). With predictive validity, Murden, McRae, Kaner, and Bucknam (1991) found 93% sensitivity and 100% specificity in the high education group (i.e., high-school diploma and/or post-high school education) at the 23-24 cutoff point, 98% sensitivity and 75% specificity in the low education group (i.e., no high-school diploma). Alpha reliability for the current sample was .60 for the total, .61 for those without CHD, and .60 for those with CHD. None of the participants had scores lower than 24 on the MMSE, which suggests no cognitive impairment (1975). The participants were then given a packet containing the demographic survey and the four questionnaires. I remained in the

room with each participant as she completed the questionnaires. The total time to complete all screenings and questionnaires ranged from 45 to 90 minutes. All of the participants were entered for a chance to win one of four $25 Wal-Mart gift cards. The four winners were notified and provided with their gift card.

**Measures**

**Demographics Questionnaire**. The Demographics Questionnaire was administered to participants and asks descriptive questions present above in Table 1- 5. Questions for this questionnaire were created based upon risk factors identified on the AHA (2007a) website.

**The Perception of Risk of Heart Disease Scale (PRHDS).** CHD was defined in this study in accordance with the description provided by the World Health Organization (Mackay and Mensah, 2004) which includes the failure of adequate coronary circulation to the heart muscle and surrounding tissue that greatly decreases blood flow resulting in a heart attack, chest pain, and even death. Perceived risk (i.e., perceived susceptibility) is a causal association in how one manages his or her health, especially in protecting health (Aiken, Gerend, & Jackson, 2001). Perceived risk draws from the Health Belief Model (HBM; Rosenstock, 1966), which focuses on both explaining and predicting the likelihood of preventive health behavior, considering the associations between health behaviors and the use of health services, and health motivation to differentiate health behavior from disease (1966). The definition of perceived risk in the Health Belief Model (HBM; Rosenstock, 1966) includes beliefs concerning the probability or likelihood that a negative health outcome will occur (Rosenstock, 1966, 1974).

The PRHDS assesses an individual's perception of the likelihood that he or she will get CHD. This instrument consists of 21 items and consists of a four-point scale ranging from one (i.e., strongly disagree) to four (i.e., strongly agree) and is designed to place people on a continuum from low risk perception to high risk perception. It is divided into three subscales, including 1) Dread risk (i.e., perceptions on having a lack of control over events, dread that events will occur, and potential for terminal and disastrous consequences from these events); 2) Risk (i.e., perceptions that events have moderate and known outcomes and consequences and that these consequences are few in number); and 3) Unknown risk (i.e., perceptions that events are new, not known, not observable, and deferred in their likelihood to cause harm). Item scores are summed for each of these three subscales, as well as subscales for a total score. Reverse scoring is required on some of the items. Higher scores on these subscales indicate a higher perception of risk of heart disease. The maximum score for the Dread Risk subscale is 28 and the minimum is seven. The maximum score for the Unknown Risk subscale is 28 and the minimum is seven. The maximum total score for this instrument is 80 and the minimum total score is 20. The authors of this instrument used a final sample of 295 participants, including 146 males and 149 females ranging in age from 15 to 75 years with a mean age of 33, to test reliability and validity. The authors found a mean score of 43 ($SD$ = 7.46) for the total instrument, which they considered to be a medium score (Ammouri, Neuberger, Mrayyan, & Hamaideh, 2010), and which I used as a comparison for scores on the PRHDS for current study sample.

In addition, the authors of this instrument found Cronbach's alpha internal consistency reliability coefficients for each of the three subscales to be .80 for Dread

Risk, .72 for Risk, and .68 for Unknown Risk. Overall reliability was .80 and test-retest reliabilities ranged from .61 to .76 (2008). The PRHDS was found to positively correlate with the Health Promotion Lifestyle Profile II (HPLP; Walker & Hill-Polrecky, 1996).

For the current study, five individuals were excluded from the analyses involving the PRHDS because they answered less than half of the 20 items on this instrument. (See participants' demographic profiles in Appendix S). For all other participants, the mean for the item was substituted for missing data. As shown in Table 6, the overall reliability for the PRHDS for the sample of older women in this study was an alpha coefficient of .80 for the total sample. The reliabilities for the subscales were alpha coefficient of .91 for the Dread Risk subscale, .77 for the Risk subscale, and .67 for the Unknown Risk subscale for the total sample. The alpha reliability coefficient for women without CHD was .70 for the overall PRHDS and .87 for women with CHD. For the subscales, the alpha reliability coefficient for the Dread Risk subscale was .87, the Risk subscale was .72, and the Unknown Risk subscale was .63 for women without CHD. For women with CHD, the alpha reliability coefficient for the Dread Risk subscale was .87, the Risk subscale was .89, and the Unknown Risk subscale was .87.

**CHD Knowledge Tool for Women**. CHD knowledge refers to an individual's knowledge, awareness, and perceptions about coronary heart disease (American Heart Association, 2000; Mosca, Ferris, Fabunmi, & Robertson, 2004). In this study, CHD knowledge was measured by using the CHD Knowledge Tool for Women (Thanavaro, Thanavaro, & Delicath, 2010), which was designed specifically for women to assess their awareness of CHD information. The original CHD Knowledge Test (Smith, Hicks, & Heyward, 1991) was designed to assess the CHD knowledge levels in men. Oliver-

McNeil and Artinian (2002) modified the original CHD Knowledge Test to use specifically with women to better assess factors associated with women's CHD risk factors. However, feedback from participants indicated that some of the language was difficult to understand (e.g., atherosclerosis or angina pectoris), and the instrument also lacked updated knowledge about CHD (e.g., hormone replacement therapy; Mosca et al., 2004). Consequently, Thanavaro, Thanavaro, and Delicath (2010) developed the CHD Knowledge Tool for Women specifically to use for clinical purposes with women. Conceptually based upon Pender's Health Promotion Model (HPM; Pender, 1996), this instrument assesses the cognitive, behavioral, and affective knowledge of CHD specifically in women. The age range of the normative sample included 30 to 65 years of age, with a mean age of 52 (*SD* = 11.32). Higher scores on this instrument suggest more knowledge about CHD. Mean scores in the validity study for a control group of women who did not participate in a cardiac education program were 18.1 (*SD* = 3.2), which was considered to be low (Thanavaro, Thanavaro, & Delicath, 2010) and which I used as a comparison for the mean scores of the current study sample. The authors of this instrument found Cronbach's alpha coefficient to be .74. For the reliability analysis in the current study sample, I substituted the means of the items for those items that had no response. As shown in Table 6, the overall reliability for the CHD Knowledge Tool in this sample showed a correlation coefficient of .81 for the total sample. As depicted in Tables 7 – 8, for women without CHD, the alpha reliability was .83, and for those with CHD, the alpha reliability was. 70.

**Health-Promoting Lifestyle Profile – II (HPLP – II)**. Health preventive behaviors were operationalized by using the HPLP – II (Walter & Hill-Polrecky, 1996).

Health preventive behaviors are those behaviors an individual takes to prevent or arrest a disease or condition (Duvernoy & Mosca, 1999) and addresses the behaviors in which an individual will engage to keep herself from developing a particular disease or in preventing the progression of a disease to promote overall health. The HPLP - II (1996) assesses an individual's tendency to engage in behaviors that promote health and well-being. The original instrument was the Health-Promoting Lifestyle Profile (HPLP; Walker, Sechrist, & Pender, 1986) designed to measure individuals' engagement in behavior to promote a healthy lifestyle. The HPLP - II was designed to include more current health information and to demonstrate a more equal distribution of items across subscales. The HPLP - II consists of 52 items utilizing a four-point scale ranging from one to four (i.e., never, sometimes, often, and routinely). This instrument contains six subscales, including 1) Health responsibility; 2) Physical activity; 3) Nutrition; 4) Spiritual growth; 5) Interpersonal relations; and 6) Stress management. An overall mean and subscale means can be obtained from this instrument, with higher scores representing a healthier lifestyle. The authors recommend the use of mean scores rather than summed scores to encourage meaningful responses across the subscales. However, the instrument can be summed across subscales and for a total score. The maximum score for each of the Physical Activity and the Stress Management is 32 and the minimum score is eight. The maximum score for the other subscales is 36 and the minimum is nine. The maximum total score for this instrument is 208 and the minimum is 52. The authors of this instrument assessed reliability and validity using a sample of 712 adults in the age range of 18 to 92 years. The authors found the range of alpha coefficients for the subscales comprising this instrument to range from .79 to .87 with .94 for the total score.

They found that the test-retest reliability coefficient, internal consistency and construct validity scores were good or very good (1996). Researchers have used this instrument in previous studies to examine health-preventive behaviors in women (Oliver-McNeil & Artinian, 2002). In a recent study examining women's perceptions of personal cardiovascular risk factors and health behaviors, Oliver-McNeil and Artinian (2002) found the mean score for the instrument to be 2.44 (*SD* = .50), which they considered to be low and which I used as a comparison for mean scores on the HPLP – II for this sample. For the reliability analysis for the HPLP-II in this sample, I substituted the item means for missing responses on this measure. For the total sample, as shown in Table 6, Cronbach's alpha was .95 for the overall instrument, demonstrating strong internal reliability. For those women without CHD, the alpha reliability was .94. For those women with CHD, the alpha reliability was .96. The alpha reliability coefficients for the subscales for the total sample, as well as women with and without CHD are presented in Tables 6 - 8.

**Beck Depression Inventory – II (BDI – II)**. The Beck Depression Inventory – Second Edition (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item self-report screening tool designed to estimate the degree of depressive symptoms in individuals 13 years of age and older. The items on this instrument are consistent with the depressive symptoms from the *DSM-IV-TR* (American Psychiatric Association, 2000). Individuals who take this test rate items on a four-point scale from zero to three with a maximum score of 63 points. Scores ranging from zero to 13 suggest minimal depression. Scores ranging from 14 to 19 suggest mild depression. Scores ranging from 20 to 28 suggest moderate depression. Scores ranging from 29 to 63 suggest severe depression. The reliability of

the BDI-II is high, with coefficient alphas of .92 for outpatients. Among older adults, the BDI-II correlated with the Centers for Epidemiological Scale for Depression (CES-D; Radloff, 1977) scale (r = .69) and with the Coolidge Axis II Inventory (CATI; Coolidge & Merwin, 1992) Depression scale (r = .66). In a study assessing the psychometric properties of the BDI – II among older community-dwelling adults, the mean score was 8.61 (SD = 7.69). It is also appropriate across various cultural and ethnic groups (Beck, et al., 1996). As shown in Table 6, the alpha reliability for the total sample was .86. The alpha reliability for the subscales was .73 for the Cognitive subscale and .81 for the Somatic subscale for the total sample. The alpha reliability for the overall BDI – II for women without CHD was .83. The alpha reliability for the subscales of the BDI – II for the total sample, as well as for women with and without CHD are presented in Tables 6 - 8.

Table 6

*Psychometric Properties of Instruments Used in Study Analyses for Total Sample*

| Measures | N | M | SD | A | Range | | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|---|
| | | | | | Potential | Actual | | |
| PRHDS | 98 | 46.16 | 10.50 | .80 | 1—80 | 29—75 | .58 | -.05 |
| DR | 98 | 16.60 | 5.31 | .91 | 7—28 | 7—28 | .20 | -.17 |
| Risk | 98 | 14.81 | 5.44 | .77 | 6—24 | 6—24 | -.17 | -1.41 |
| UR | 98 | 14.76 | 4.89 | .67 | 6—24 | 7—28 | .60 | -.07 |
| CHD | 103 | 16.01 | 4.18 | .81 | 0—25 | 3—22 | -.91 | .80 |
| HPLP | 103 | 2.59 | .46 | .95 | 1—52 | 1.44—3.61 | -.15 | -.51 |
| HR | 103 | .64 | .13 | .80 | 1—36 | .36—.92 | .07 | -.76 |
| PA | 103 | .52 | .17 | .86 | 1—32 | .25—1.00 | .53 | -.30 |
| NT | 103 | .64 | .13 | .79 | 1—36 | .30—.92 | -.01 | -.17 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SG | 103 | .72 | .14 | .87 | 1—36 | .39—1.00 | -.28 | -.49 |
| IR | 103 | .72 | .14 | .86 | 1—36 | .33—1.00 | -.42 | .15 |
| SM | 103 | .66 | .14 | .78 | 1—32 | .31—1.00 | .08 | -.27 |
| BDI – II | 103 | 8.92 | 6.74 | .86 | 0—63 | 0—33 | 1.15 | 1.18 |
| Cog | 103 | 1.40 | 1.96 | .73 | 0—27 | 0—9 | 1.86 | 3.50 |
| Som | 103 | 7.22 | 5.08 | .81 | 0—36 | 0—24 | .96 | .74 |

*Note*: The sample size variation is due to the number of participants who answered at least three-fourths of the items. The scales and subscales shown above include the Perceived Risk of Heart Disease Scale (PRHDS), which has the Unknown Risk (UR) Risk, and Dread Risk (DR) subscales. The Beck Depression Inventory – II is also depicted, including the Cognitive (Cog) and Somatic-Affective (Som) subscales. The CHD Knowledge Tool for Women (CHD) is also depicted in this table. The Health Promoting Lifestyle Profile – II is presented, including the Health Responsibility (HR); Physical Activity (PA); Nutrition (NT); Spiritual Growth (SG); Interpersonal Relations (IR), and the Stress Management (SM) subscales.

Table 7

*Psychometric Properties of Instruments for Women without CHD*

| Measures | n | M | SD | α | Range | | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|---|
| | | | | | Potential | Actual | | |
| PRHDS | 78 | 44.22 | 8.70 | .70 | 1—80 | 29—70 | .31 | -.28 |
| DR | 78 | 15.09 | 4.28 | .87 | 7—28 | 7—22 | -.34 | -.69 |
| Risk | 78 | 14.48 | 5.08 | .72 | 6—24 | 6—23 | -.18 | -1.42 |
| UR | 78 | 14.66 | 4.91 | .63 | 6—24 | 7—28 | .68 | .05 |
| CHD | 79 | 15.17 | 4.43 | .83 | 0—25 | 3—22.07 | -.88 | .51 |
| HPLP | 79 | 2.58 | .44 | .94 | 1—52 | 1.65—3.51 | .08 | -.67 |
| HR | 79 | .63 | .13 | .77 | 1—36 | .36—.92 | .04 | -.68 |
| PA | 79 | .51 | .17 | .86 | 1—32 | .25—1.00 | .65 | .05 |
| NT | 79 | .63 | .13 | .78 | 1—36 | .30—.92 | .01 | -.17 |
| SG | 79 | .73 | .14 | .86 | 1—36 | .41—1.00 | -.14 | -.75 |
| IR | 79 | .72 | .13 | .81 | 1—36 | .36—1.00 | -.17 | -.19 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SM | 79 | .65 | .14 | .76 | 1—32 | .37—1.00 | -.17 | -.29 |
| BDI – II | 79 | 7.99 | 6.03 | .83 | 0—63 | 0—27 | 1.06 | .78 |
| Cog | 79 | 1.21 | 1.78 | .70 | 0—27 | 0—9 | 2.01 | 4.87 |
| Som | 79 | 6.51 | 4.65 | .75 | 0—36 | 0—22 | .91 | .62 |

*Note*: The sample size variation is due to the number of participants who answered at least three-fourths of the items. The scales and subscales shown above include the Perceived Risk of Heart Disease Scale (PRHDS), which has the Unknown Risk (UR) Risk, and Dread Risk (DR) subscales. The Beck Depression Inventory – II is also depicted, including the Cognitive (Cog) and Somatic-Affective (Som) subscales. The CHD Knowledge Tool for Women (CHD) is also depicted in this table. The Health Promoting Lifestyle Profile – II is presented, including the Health Responsibility (HR); Physical Activity (PA); Nutrition (NT); Spiritual Growth (SG); Interpersonal Relations (IR), and the Stress Management (SM) subscales.

Table 8

*Psychometric Properties of Instruments Women with CHD*

| Measures | n | M | SD | A | Range | | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|---|
| | | | | | Potential | Actual | | |
| PRHDS | 19 | 54.73 | 13.04 | .87 | 1—80 | 33.25—75.00 | -.17 | -1.01 |
| DR | 20 | 22.56 | 4.99 | .89 | 7—28 | 14—28 | -.31 | -1.54 |
| Risk | 20 | 14.81 | 5.44 | .87 | 6—24 | 6—24 | -.59 | -1.35 |
| UR | 20 | 15.56 | 4.67 | .55 | 6—24 | 8—26 | .42 | .00 |
| CHD | 23 | 16.93 | 3.17 | .70 | 0—25 | 10—22 | -.12 | -.51 |
| HPLP | 23 | 2.58 | .59 | .96 | 1—52 | 1.44—3.44 | -.64 | -.23 |
| HR | 23 | .66 | .15 | .82 | 1—36 | .42—.89 | -.05 | -1.01 |
| PA | 23 | .54 | .21 | .90 | 1—32 | .25--.91 | .15 | -.98 |
| NT | 23 | .63 | .15 | .82 | 1—36 | .33—.92 | -.02 | -.14 |
| SG | 23 | .69 | .17 | .88 | 1—36 | .39—.94 | -.61 | -.10 |
| IR | 23 | .68 | .18 | .91 | 1—36 | .33—.97 | -.84 | .28 |
| SM | 23 | .65 | .16 | .83 | 1—32 | .31—.91 | -.53 | -.08 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BDI – II | 23 | 12.11 | 8.25 | .84 | 0—63 | 1.60—33 | .93 | .38 |
| Cog | 23 | 1.91 | 2.45 | .84 | 0—27 | 0—8 | 1.58 | 1.61 |
| Som | 23 | 9.77 | 5.86 | .84 | 0—36 | 1.60—24 | .77 | .18 |

*Note*: The sample size variation is due to the number of participants who answered at least three-fourths of the items. The scales and subscales shown above include the Perceived Risk of Heart Disease Scale (PRHDS), which has the Unknown Risk (UR) Risk, and Dread Risk (DR) subscales. The Beck Depression Inventory – II is also depicted, including the Cognitive (Cog) and Somatic-Affective (Som) subscales. The CHD Knowledge Tool for Women (CHD) is also depicted in this table. The Health Promoting Lifestyle Profile – II is presented, including the Health Responsibility (HR); Physical Activity (PA); Nutrition (NT); Spiritual Growth (SG); Interpersonal Relations (IR), and the Stress Management (SM) subscales.

**Statistical Analyses**

Data were analyzed using PASW Statistics 18.0 for Windows. Statistical analyses included descriptive statistics on the sample, reliability of instruments already reported, correlations, crosstabulations, chi-square, *t*-tests, and where relevant a MANOVA. As shown in Table 6, all scales and subscales were normally distributed. All scales and subscales for the subsamples of women without CHD and women with CHD were also normally distributed. Because about one-fourth of the sample indicated they had been diagnosed by a physician with CHD, I used crosstab and chi-square analyses to check for differences in occurrence of depression and anxiety as indicated above. I also used independent sample *t*-tests to check for possible differences in means on all the instruments between those participants reporting a diagnosis of CHD and those not.

Pearson *r* correlation coefficients were used to examine the associations among the variables for the total sample and for those women without and with a CHD diagnosis. Because of the number of analyses, in order to avoid Type I error, I set the *p* value at .01 (Pagano, 2007). An independent sample *t*-test was first run to determine if there was a difference in responses to items on the PRHDS, CHD Knowledge Tool for

Women, the HPLP – II, and the BDI - II based upon whether or not the participant had CHD.

## Results

Because the PRHDS is a measure that assesses the likelihood that an individual will be diagnosed with CHD in the future, there may have been differences in the way women without CHD and women with CHD responded to the items on this instrument. As shown in Table 9, independent sample *t*-tests showed a significant difference ($t$ = -4.25, p = .00) in mean scores on the PRHDS between women diagnosed with CHD and those who did not have a CHD diagnosis. The Dread Risk subscale also showed a significant difference ($t$ = -6.62, p = .00) in responses to items on this subscale for women without and with CHD. Thus, Pearson *r* correlation analyses were run for both women without CHD and those with CHD.

Table 9

*Summary of the Means, Standard Deviations, t Scores, Significance, and 95% Confidence Intervals (CI) for Women with and without CHD on the Perceived Risk of Heart Disease Scale (PRHDS) and Subscale, the CHD Knowledge Tool for Women (CHD), the Health Promoting Lifestyle Profile – II (HPLP – II) and Subscales, and the Beck Depression Inventory – II (BDI – II) and Subscales*

| Overall and Subscale Measures | Without CHD | | With CHD | | | | 95% CI | |
|---|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | *t* | *P* | LL | UL |
| PRHDS | 44.26 | 8.70 | 54.74 | 13.04 | -4.25 | .00 | -15.43 | -5.60 |
| DR | 15.10 | 4.23 | 22.57 | 4.99 | -6.62 | .00 | -9.73 | -5.25 |
| Risk | 14.48 | 5.08 | 16.61 | 6.44 | -1.56 | .12 | -4.86 | .59 |
| UR | 14.66 | 4.90 | 15.56 | 4.67 | -.73 | .47 | -3.37 | 1.57 |
| CHD | 15.76 | 4.43 | 16.93 | 3.17 | -1.22 | .22 | -3.19 | .75 |
| HPLP | 2.58 | .44 | 2.58 | .59 | -.34 | .74 | -13.50 | 9.59 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| HR | .63 | .13 | .66 | .15 | -1.04 | .30 | -3.55 | 1.10 |
| PA | .50 | .17 | .54 | .21 | -.92 | .36 | -3.92 | 1.44 |
| NT | .63 | .13 | .63 | .15 | -.63 | .53 | -2.99 | 1.56 |
| SG | .72 | .13 | .69 | .17 | .60 | .55 | -1.70 | 3.18 |
| IR | .72 | .13 | .68 | .18 | .57 | .57 | -1.74 | 3.13 |
| SM | .65 | .14 | .65 | .16 | -.20 | .85 | -2.33 | 1.91 |
| BDI – II | 8.00 | 6.03 | 12.11 | 8.25 | -2.64 | .01 | -7.22 | -1.03 |
| Cog | 1.21 | 1.78 | 1.91 | 2.45 | -1.52 | .13 | -1.61 | .21 |
| Som | 6.51 | 4.65 | 9.77 | 5.86 | -2.79 | .01 | -5.58 | -9.37 |

*Note.* The Perceived Risk of Heart Disease Scale (PRHDS), the CHD Knowledge Tool for Women (CHD), and the Health Promoting Lifestyle Profile – II (HPLP – II) are presented here. The significance (Sig.) of F is presented, as well as the significance (Sig. 2-tailed) of t. The mean differences for these instruments are also presented in addition to the standard error (SE) of the mean difference. The confidence intervals (CI) are also presented.

On average, women without heart disease perceived their risk of getting heart disease to fall in the middle as measured by the PRHDS (*M* = 44.26, SD =8.70). On the CHD Knowledge Tool for Women, average scores for the women without CHD were low (*M* = 15.76, SD = 4.43), as well as for women with CHD (*M* = 16.93, SD = 3.17). With health behaviors measured by the HPLP – II, the scores for those participants without CHD were low (*M* = 2.58, SD = .44), as well as for those participants with CHD (*M* = 2.58, SD = .59).

For the total sample on the BDI-II, 78.6% (N = 81) of participants scored in the "none or minimal" level. The depression scores on the BDI – II for 12.6% (N = 13) of the total participants fell in the mild range, 7.8% (N = 8) fell in the moderate range, and one percent (N = 1) fell in the severe range. To further understand the relationship between CHD and depression in my sample, crosstabulations and chi square analyses were

conducted for women who reported a diagnosis of CHD and depression. As depicted in Table 10, the sample included 23 women who reported having a diagnosis of CHD, 80 women who reported not having a diagnosis of CHD, and ten women who reported having a diagnosis of depression. As shown, 9.7% of women reported a diagnosis of both CHD and depression. As can be seen by the frequencies cross tabulated in Table 10, there was a significant difference between women with and without a CHD diagnosis and depression ($x^2(1, N = 10) = 8.62, p = .003$).

Table 10

*Crosstabulation of Diagnosis of Self-reported CHD and/or Depression*

| Diagnosis with CHD | Diagnosis with Depression | |
|---|---|---|
| Yes | Yes | No |
| N | 10.0 | 13.0 |
| % | 9.7 | 12.6 |
| No | | |
| N | 12.0 | 68.0 |
| % | 11.7 | 66.0 |
| Total Sample | | |
| N | 22.0 | 81.0 |
| % | 21.4 | 78.6 |

Table 11 provides the correlation coefficients for the relationships among PRHDS and subscales, CHD Knowledge Tool for Women, the HPLP – II and subscales, and the BDI – II and subscales for women with and without CHD.

Table 11

*Summary of Pearson r Correlation Coefficients, Means, and Standard Deviations for Scores on PRHDS, BDI-II, CHD Knowledge Tool for Women (CHD), and HPLP – II*

| Measure | 1 | 2 | 3 | 4 | *M* | SD |
|---|---|---|---|---|---|---|
| 1. PRHDS | - | .34 | -.00 | .27 | 54.74 | 13.04 |
| 2. CHD | -.16 | - | .27 | -.25 | 16.93 | 3.17 |
| 3. HPLP – II | .17 | .12 | - | -.74** | 2.58 | .59 |
| 4. BDI – II | .04 | .04 | -.24* | - | 12.11 | 8.25 |
| *M* | 44.22 | 15.71 | 2.58 | 8.00 | | |
| SD | 8.70 | 4.43 | .44 | 6.03 | | |

*Note.* Intercorrelations for women without CHD are presented below the diagonal, and intercorrelations for women with CHD are presented above the diagonal. Pearson *r* correlation coefficients for the Perceived Risk of Heart Disease Scale (PRHDS), the CHD Knowledge Tool for Women (CHD), the Health Promoting Lifestyle Profile – II (HPLP – II), and the Beck Depression Inventory - II (BDI – II). Means and standard deviations for women without CHD are presented in the vertical columns, and means and standard deviations for women with CHD are presented in the horizontal columns.
**p < .01 * p < .05

Table 12 shows the Pearson *r* correlation coefficients for the PRHDS and subscales and the CHD Knowledge Tool for Women. As depicted, a strong association between the Dread Risk subscale and the CHD Knowledge Tool for Women ($r = .60$, $p < .01$) without a CHD diagnosis, and a moderate association was found between the Unknown Risk subscale and the CHD Knowledge Tool for Women ($r = .34$, $p < .01$) without a CHD diagnosis.

Table 12

*Summary of the Pearson r Correlation Coefficients, Means, and Standard Deviations of the PRHDS Overall and Subscales and the CHD Knowledge Test*

| Overall and Subscale Measures | 1 | 1a | 1b | 1c | 2 | *M* | SD |
|---|---|---|---|---|---|---|---|
| 1. PRHDS | - | .21 | .89** | .74** | .34 | 54.74 | 13.04 |
| 1a. DR | .21 | - | .46** | -.34 | .05 | 22.57 | 4.99 |
| 1b. Risk | .83** | -.15 | - | .59** | .44 | 16.61 | 6.44 |
| 1c. UR | .74** | .34** | .60** | - | .29 | 15.56 | 4.67 |
| 2. CHD | -.16 | .60** | -.34** | -.08 | - | 16.93 | 3.17 |
| *M* | 44.22 | 15.10 | 14.48 | 14.66 | 15.71 | | |
| SD | 8.70 | 4.23 | 5.08 | 4.90 | 4.43 | | |

*Note.* Intercorrelations for women without CHD are presented below the diagonal, and intercorrelations for women with CHD are presented above the diagonal. Pearson *r* correlation coefficients for the Perceived Risk of Heart Disease Scale (PRHDS), the Dread Risk (DR) subscale, the Risk subscale, the Unknown Risk (UR) subscale, the CHD Knowledge Tool for Women (CHD). Means and standard deviations for women without CHD are presented in the vertical columns, and means and standard deviations for women with CHD are presented in the horizontal columns.
**p < .01 * p < .05

Table 13 provides the Pearson *r* correlation coefficients for the PRHDS and the HPLP – II.

Table 13

*Summary of the Pearson r Correlation Coefficients, Means, and Standard Deviations of the PRHDS Overall and Subscales and the HPLP – II Overall and Subscales*

| Measure | 1 | 1a | 1b | 1c | 2 | 2a | 2b | 2c | 2d | 2e | 2f | *M* | SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. PRHDS | - | .74** | .89** | .78** | -.00 | .07 | -.11 | .08 | -.00 | -.01 | .04 | 54.74 | 13.04 |
| 1a. DR | .19 | - | .47** | -.32 | -.09 | .06 | -.07 | -.04 | -.18 | -.11 | .02 | 22.57 | 4.99 |
| 1b. Risk | .82** | -.17 | - | .59** | .08 | .02 | -.10 | .08 | .10 | .14 | .09 | 16.61 | 6.44 |
| 1c. UR | .74** | .33** | .59** | - | -.02 | -.18 | -.08 | .16 | .03 | -.12 | -.03 | 15.56 | 4.67 |
| 2. HPLP – II | .16 | -.12 | .06 | .33** | - | .34 | .71** | .88** | .93** | .88** | .87** | 2.58 | .59 |
| 2a. HR | .05 | -.11 | .04 | -.03 | .24* | - | .18 | .18 | .37 | .43 | .10 | .66 | .15 |
| 2b. PA | .22* | -.06 | .17 | .27* | .61** | .01 | - | .59** | .57** | .38 | .65** | .54 | .21 |
| 2c. NT | .08 | -.07 | .01 | .21* | .78** | .28* | .41** | – | .80** | .69** | .75** | .69 | .17 |
| 2d. SG | .10 | -.19 | -.04 | .36** | .84** | .12 | .34** | .56** | – | .89** | .68** | .69 | .17 |
| 2e. IR | .14 | -.03 | .06 | .22* | .84** | .16 | .35** | .53** | .76** | – | .67** | .69 | .18 |
| 2f. SM | .12 | -.07 | .02 | .26* | .88** | .24* | .50** | .62** | .72** | .72** | – | .65 | .16 |
| *M* | 44.22 | 15.10 | 14.48 | 14.66 | 2.58 | .63 | .50 | .63 | .72 | .72 | .66 | | |
| SD | 8.70 | 4.23 | 5.08 | 4.90 | .44 | .13 | .17 | .13 | .13 | .13 | .14 | | |

*Note.* Intercorrelations for women without CHD are presented below the diagonal, and intercorrelations for women with CHD are presented above the diagonal. Pearson *r* correlation coefficients for the Perceived Risk of Heart Disease Scale (PRHDS), the Dread Risk (DR) subscale, the Risk subscale, the Unknown Risk (UR) subscale, the, the Health Promoting Lifestyle Profile – II (HPLP – II), the Health Responsibility (HR) subscale, the Physical Activity (PA) subscale, the Nutrition (NT) subscale, the Spiritual Growth (SG) subscale, the Interpersonal Relations (IR) subscale, and the Stress Management (SM) subscale. Means and standard deviations for women without CHD are presented in the vertical columns, and means and standard deviations for women with CHD are presented in the horizontal columns.
**p < .01 * p < .05

Table 14 provides the Pearson *r* correlations for the PRHDS and subscales and the BDI – II and subscales.

Table 14

*Summary of Pearson r Correlation Coefficients, Means, and Standard Deviations for Overall and Subscale Scores on the PRHDS and BDI-II for Women with and without a CHD Diagnosis*

| Measure | 1 | 1a | 1b | 1c | 2 | 2a | 2b | *M* | SD |
|---|---|---|---|---|---|---|---|---|---|
| 1. PRHDS | - | .21 | .89** | .74** | .27 | .12 | .16 | 54.74 | 13.04 |
| 1a. DR | .21 | - | .46** | -.34 | -.01 | .14 | -.06 | 22.57 | 4.99 |
| 1b. Risk | .83** | -.15 | - | .59** | .24 | .36 | .18 | 16.61 | 6.44 |
| 1c. UR | .74** | .34** | .60** | - | .31 | .40 | .26 | 15.56 | 4.67 |
| 2. BDI – II | .04 | .26* | .06 | -.21 | - | .88** | .98** | 12.11 | 8.25 |
| 2a. Cog | .37 | .12 | .36 | -.11 | .72** | - | .78** | 1.91 | 2.45 |
| 2b. Som | .16 | -.08 | .18 | -.20 | .96** | .52** | - | 9.77 | 5.86 |
| *M* | 44.22 | 15.10 | 14.48 | 14.66 | 8.00 | 1.23 | 6.49 | | |
| SD | 8.70 | 4.23 | 5.08 | 4.90 | 6.03 | 1.78 | 4.67 | | |

*Note.* Intercorrelations for women without CHD are presented below the diagonal, and intercorrelations for women with CHD are presented above the diagonal. Pearson *r* correlation coefficients for the Perceived Risk of Heart Disease Scale (PRHDS), the Dread Risk (DR) subscale, the Risk subscale, the Unknown Risk (UR) subscale, the Beck Depression Inventory - II (BDI – II), the Cognitive (Cog) subscale, and the Somatic (Som) subscale. Means and standard deviations for women without CHD are presented in the vertical columns, and means and standard deviations for women with CHD are presented in the horizontal columns.
**p < .01 * p < .05

Table 15 provides the Pearson *r* correlations for the CHD Knowledge Tool for Women and the BDI – II and subscales. As depicted, no significant associations were found.

Table 15

*Summary of the Pearson r Correlation Coefficients, Means, and Standard Deviations of the Overall and Subscales of the CHD Knowledge Tool for Women and the BDI – II and Subscales*

| Measure | 1 | 2 | 2a | 2b | *M* | SD |
|---|---|---|---|---|---|---|
| 1. CHD | - | -.25 | .10 | -.34 | 16.93 | 3.17 |
| 2. BDI – II | .04 | - | .88** | .98** | 12.11 | 8.25 |
| 2a. Cog | .00 | .72** | - | .78** | 1.91 | 2.45 |
| 2b. Som | .07 | .96** | .52** | - | 9.77 | 5.86 |
| *M* | 15.71 | 8.00 | 1.23 | 6.49 | | |
| SD | 4.43 | 6.03 | 1.78 | 4.67 | | |

*Note.* Intercorrelations for women without CHD are presented below the diagonal, and intercorrelations for women with CHD are presented above the diagonal. Pearson *r* correlation coefficients for the CHD Knowledge Tool for Women (CHD and the Beck Depression Inventory - II (BDI – II), the Cognitive (Cog) subscale and the Somatic (Som) subscale are presented. Means and standard deviations for women without CHD are presented in the vertical columns, and means and standard deviations for women with CHD are presented in the horizontal columns.
**p < .01 * p < .05

Table 16 presents the Pearson *r* correlations for the CHD Knowledge Tool for Women and the HPLP – II and subscales for women with and without a CHD diagnosis. As shown, no significant correlations for either women without or women with CHD were found between CHD knowledge and the HPLP – II overall scale. As shown, no significant associations were found between the CHD Knowledge Tool for Women and the HPLP – II and subscales for women without or with CHD.

Table 16

*Summary of Pearson r Correlation Coefficients, Means, and Standard Deviations of the Overall and Subscale of the CHD Knowledge Tool for Women and the HPLP – II and Subscales*

| Measure | 1 | 2 | 2a | 2b | 2c | 2d | 2e | 2f | *M* | SD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. CHD | - | .27 | .26 | .03 | .25 | .36 | .27 | .11 | 16.93 | 3.17 |
| 2. HPLP – II | .12 | - | .26 | .73** | .88** | .88** | .84** | .87** | 2.58 | .59 |
| 2a. HR | -.01 | .24* | - | .14 | .11 | .33 | .34 | .02 | .66 | .15 |
| 2b. PA | .01 | .64** | .01 | - | .62** | .52* | .36 | .66** | .54 | .21 |
| 2c. NT | .17 | .77** | .24* | .41** | – | .73** | .62** | .74** | .63 | .15 |
| 2d. SG | .10 | .83** | .11 | .32** | .54** | – | .89** | .63** | .69 | .17 |
| 2e. IR | .14 | .84** | .16 | .35** | .53** | .75** | – | .64** | .68 | .18 |
| 2f. SM | .12 | .88** | .24* | .50** | .62** | .74** | .72** | – | .65 | .16 |
| *M* | 15.71 | 2.58 | .63 | .50 | .63 | .72 | .72 | .65 | | |
| SD | | .44 | .13 | .17 | .13 | .13 | .13 | .14 | | |

*Note.* Intercorrelations for women without CHD are presented below the diagonal, and intercorrelations for women with CHD are presented above the diagonal. Pearson *r* correlation coefficients for the CHD Knowledge Tool for Women (CHD), the Health Promoting Lifestyle Profile – II (HPLP – II), the Health Responsibility (HR) subscale, the Physical Activity (PA) subscale, the Nutrition (NT) subscale, the Spiritual Growth (SG) subscale, the Interpersonal Relations (IR) subscale, and the Stress Management (SM) subscale. Means and standard deviations for women without CHD are presented in the vertical columns, and means and standard deviations for women with CHD are presented in the horizontal columns.
**p < .01 * p < .05

Table 17 presents the Pearson *r* correlations for the HPLP – II and subscales and the BDI – II and subscales. For women with CHD a strong correlation was found between the HPLP and the BDI – II ($r = -.74$, $p < .01$). As depicted, strong associations were found between most of the subscales of the HPLP – II and the overall BDI – II for

women with CHD. Moderate to strong associations were found between some of the subscales of the HPLP and the BDI – II subscales for the women with CHD.

Table 17

*Summary of the Pearson r Correlation Coefficients, Means, and Standard Deviations of the HPLP – II Overall and Subscales and the BDI – II Overall and Subscales*

| Measure | 1 | 1a | 1b | 1c | 1d | 1e | 1f | 2 | 2a | 2b | *M* | SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. HPLP – II | - | .91** | .71** | .88** | .93** | .88** | .86** | -.74** | -.62** | -.77** | 2.58 | .59 |
| 1a. HR | .24* | - | .18 | .18 | .37 | .43 | .10 | -.67** | -.41 | -.73** | .66 | .15 |
| 1b. PA | .64** | .01 | - | .59** | .57** | .38 | .65** | -.61** | -.52** | -.63** | .54 | .21 |
| 1c. NT | .78** | .28* | .41** | – | .80** | .69** | .75** | -.66** | -.46* | -.70** | .69 | .17 |
| 1d. SG | .84** | .12 | .34** | .56** | – | .89** | .68** | -.67** | -.55** | -.67** | .69 | .17 |
| 1e. IR | .84** | .16 | .35** | .53** | .76** | – | .67** | -.61** | -.53** | -.60** | .69 | .18 |
| 1f. SM | .88** | .24* | .50** | .62** | .72** | .72** | – | -.49* | -.32 | -.54** | .65 | .16 |
| 2. BDI – II | -.24* | .10 | -.24* | -.08 | -.34** | -.17 | -.20 | - | .88** | .98** | 12.11 | 8.25 |
| 2a. Cog | -.00 | .06 | -.13 | .04 | -.13 | .10 | -.01 | .72** | - | .78** | 1.91 | 2.45 |
| 2b. Som | -.30** | .09 | -.25* | -.12 | -.36** | -.25* | -.25* | .96** | .52** | - | 9.77 | 5.86 |
| *M* | 2.58 | .63 | .50 | .63 | .72 | .72 | .66 | 8.00 | 1.23 | 6.49 | | |
| SD | .44 | .13 | .17 | .13 | .13 | .13 | .14 | 6.03 | 1.78 | 4.67 | | |

*Note.* Intercorrelations for women without CHD are presented below the diagonal, and intercorrelations for women with CHD are presented above the diagonal. Pearson *r* correlation coefficients for the Health Promoting Lifestyle Profile – II (HPLP – II), the Health Responsibility (HR) subscale, the Physical Activity (PA) subscale, the Nutrition (NT) subscale, the Spiritual Growth (SG) subscale, the Interpersonal Relations (IR) subscale, the Stress Management (SM) subscale, the Beck Depression Inventory – II (BDI – II), the Cognitive (Cog) subscale, and the Somatic (Som) subscale. Means and standard deviations for women without CHD are presented in the vertical columns, and means and standard deviations for women with CHD are presented in the horizontal columns.
**p < .01 * p < .05.

**Additional Analyses**

While completing the questionnaires, a few participants indicated that they did not understand some of the items on the PRHDS and the CHD Knowledge Tool for Women. In order to understand further the data, I conducted several additional analyses, first categorizing education level into three groups, with Group 1 representing those women with less than a high school education; Group 2 representing those women with a high school education or GED; and Group 3 representing those women with more than a high school education.

In order to determine if there was a difference in responses on the PRHDS, CHD Knowledge Tool for Women, and HPLP - II based on educational level, I conducted two one-way between-subjects MANOVAs (i.e., one for women without CHD and one for women with CHD), where participants were nested in educational level. In order to see if there was a potential relationship between the question on the demographics questionnaire about women's self-reported knowledge about CHD and their scores on the CHD Knowledge Tool for Women, I conducted a one-way between subjects ANOVA. All assumptions underlying use of the one-way statistical model (independence, normality, and homogeneity of variance) were verified in this study. For women without CHD, significant differences were found with the PRHDS [$F(1,77) = 7.10$; $p = .009$] and for the BDI – II [$F(1,78) = 5.80$; $p = .018$]. For women with CHD, significant differences in responses on the CHD Knowledge Tool for Women were found [$F(2,18) = 7.13$; $p = .006$]. For women without CHD, Table 18 provides the means and standard deviations for the PRHDS, CHD Knowledge Tool for Women, HPLP – II, and BDI – II based upon educational level.

Table 18

*Less Than High Education Sample (1), the High School Education Sample (2), and the More than High School Education Sample (3) in Women without CHD*

| Overall and Subscale Measures | 1 | | | 2 | | | 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | M | SD | N | M | SD | N | M | SD |
| PRHDS | 27 | 43.82 | 7.90 | 27 | 41.25 | 7.24 | 24 | 48.01 | 9.90 |
| CHD | 27 | 14.44 | 4.52 | 27 | 16.29 | 3.79 | 24 | 16.46 | 4.87 |
| HPLP | 27 | 2.44 | .45 | 28 | 2.55 | .37 | 24 | 2.77 | .46 |
| BDI – II | 27 | 10.26 | 7.60 | 27 | 7.86 | 4.76 | 24 | 5.59 | 4.36 |

*Note.* Sample 1 represents the mean scores and standard deviations on the measures for less than high school education. Sample 2 represents the mean scores and standard deviations for high school education. Sample 3 represents the mean scores and standard deviations for more than high school education. The scales and subscales shown above include the Perceived Risk of Heart Disease Scale (PRHDS), which has the Unknown Risk (UR) Risk, and Dread Risk (DR) subscales. The Beck Depression Inventory – II is also depicted, including the Cognitive (Cog) and Somatic-Affective (Som) subscales. The CHD Knowledge Tool for Women (CHD) is also depicted in this table. The Health Promoting Lifestyle Profile – II is presented, including the Health Responsibility (HR); Physical Activity (PA); Nutrition (NT); Spiritual Growth (SG); Interpersonal Relations (IR), and the Stress Management (SM) subscales.

For women with CHD, Table 19 provides the means and standard deviations for the CHD Knowledge Tool for Women and the HPLP – II based upon educational level.

Table 19

*Less Than High Education Sample (1), the High School Education Sample (2), and the More than High School Education Sample (3) in Women with CHD*

| Overall and Subscale Measures | 1 | | | 2 | | | 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | M | SD | N | M | SD | N | M | SD |
| CHD | 6 | 14.50 | 2.32 | 7 | 18.67 | 3.14 | 6 | 17.57 | 2.34 |
| HPLP | 8 | 2.28 | .68 | 9 | 2.82 | .32 | 6 | 2.76 | .54 |

*Note.* Sample 1 represents the mean scores and standard deviations on the measures for less than high school education. Sample 2 represents the mean scores and standard deviations for high school education. Sample 3 represents the mean scores and standard deviations for more than high school education. The scales and subscales shown above include the Perceived Risk of Heart Disease Scale (PRHDS), which has the Unknown Risk (UR) Risk, and Dread Risk (DR) subscales. The Beck Depression Inventory – II is also depicted, including the Cognitive (Cog) and Somatic-Affective (Som) subscales. The CHD Knowledge Tool for Women (CHD) is also depicted in this table. The Health Promoting Lifestyle Profile – II is presented, including the Health Responsibility (HR); Physical Activity (PA); Nutrition (NT); Spiritual Growth (SG); Interpersonal Relations (IR), and the Stress Management (SM) subscales.

Additionally, no significant differences were found between self-rated knowledge of CHD facts and statistics (i.e., question on the demographics questionnaire) and the CHD Knowledge Tool for Women [$F(36,100) = 1.28$; $p = .192$] for the total sample, for women without CHD [$F(32,76) = .97$; $p = .536$], or for women with CHD [$F(12,22) = 2.21$; $p = .108$],

**Supplemental Qualitative Analyses**

In a related study, I interviewed eight women with a current or past diagnosis of clinical depression and either a diagnosis of CHD or a diagnosis of being at high risk of heart disease. Although I am not analyzing all of that data for this study, one of the interview questions is relevant and may supplement my current data. The question was: In your opinion, what is the relationship between heart disease risk and depression? After interviewing these women, I transcribed these first sets of interviews and identified themes from this question found in each woman's interview (See Appendix T for a list of the themes). In a follow-up interview, I presented each woman with the transcription of their first interview to review. Each participant briefly reviewed the transcription. I then asked them the questions for the themes found in their first interview based upon how they responded to the initial question. As depicted in Table 20, the majority of women

reported that they do not believe there is a relationship between heart disease risk and depression for them personally. Three of these women stated that a relationship could exist for others.

Table 20

*Qualitative Data on the Relationship between Heart Disease Risk and Depression*

| Category | Thematic Category | Key Terms | N |
|---|---|---|---|
| Relationship between Heart Disease Risk and Depression | | | |
| HD1 | None for self | No, depression before | P1,P3,P8,P6,P4,P2 |
| HD2 | Maybe for others | Could be, don't know | P2,P3,P4, |
| HD3 | Yes for others | | P1,P7 |
| HD4 | Undecided for self | | P2,P3 |
| HD5 | How Relationship may exist | Inherited, stress signals from brain to heart | P4,P7 |
| HD6 | None for others | | P6,P8 |
| HD7 | Yes for self | | P7 |

*Note.* The relationship between CHD and depression is represented by category one (CHD1) is presented here by thematic category with category one represented as HD1, category two as HD2, category three as HD3, category four as HD4, category five as HD5, category six as HD6, and category seven as HD7. Participants are represented by the following P1 (Participant one), P2 (Participant two), P3 (Participant three), P4 (Participant four), P5 (Participant five), P6 (Participant six), P7 (Participant seven), and P8 (Participant eight).

## Discussion

### Interpretation and Implication of Results

Perceived risk of heart disease is an important factor for health and mental health professionals to consider among older women because CHD is the leading cause of death among women (Mosca, Mochari-Greenberger, Dolor, Newby, & Robb, 2010) and women who perceive their risk to be low may not take measures to promote their health

or reduce risk factors related to heart disease. Women in this study responded differently to items on the PRHDS depending upon whether they had a CHD diagnosis or not. This finding makes sense given that the items on the PRHDS reflect the likelihood that the respondent will get heart disease. Those who already have a diagnosis of CHD may have found responding to these items difficult. Previous researchers found that women tend to believe they have a low risk of getting heart disease (Fiandt, et al., 1999). On the PRHDS, the mean scores for this sample of women without CHD were approximately the same as the mean scores found by Ammouri, Neuberger, Mrayyan, and Hamaideh (2010), who described a mean score of 43 to be a middle score given that 80 is the maximum number of points a person could obtain on the instrument. It may be that women in this sample fell in the middle because they were uncertain about whether or not they may develop CHD. In fact, while they filled out the questionnaires, some women reported that they were unsure about the possibility of developing heart disease in the future. This uncertainty may relate to knowledge about CHD. That is, if a woman does not know information about CHD, she may not be adequately able to assess her likelihood of obtaining heart disease in the future.

In fact, as expected, those women without CHD had limited knowledge about CHD. The results support studies by Oliver-McNeil and Artinian (2002) and Thanavaro, et al. (2006) who found that women have little knowledge about heart disease. The women without CHD in this study scored an average of 63% on the CHD Knowledge Tool for Women, and those diagnosed with CHD scored an average of approximately 68%. Thanavaro, et al. (2006) reported finding an average of 60% on the CHD Knowledge Test (i.e., an older version of the CHD Knowledge Tool for Women) and

Oliver-McNeil and Artinian found an average of 65% in their sample of women diagnosed with heart disease, which they considered to be low scores.

The women in my sample most frequently missed questions about the relationship of menopause and heart disease; differences in severity of heart disease between men and women; heart disease prevention in women; relationship of smoking to heart disease; and the relationship between female hormones and heart disease. Of those participants who answered incorrectly about the sex differences in severity of heart disease, 68 of the 79 women without CHD and 19 of the 23 women with CHD did not realize that once women are diagnosed with CHD, they are more likely than men to either die or become seriously ill. As shown in Table 1, most women were comfortable discussing CHD concerns with their physician. In the current sample, five women reported having a lot of knowledge about heart disease on a demographics question asking respondents to circle either one (No knowledge); Two (A little bit of knowledge); Three (Average knowledge); Four (Some Knowledge), or Five (A lot of knowledge). Most women in the total sample reported having only a little bit of knowledge about heart disease facts and statistics. There were no differences between responses to the self-reported information on the demographics questionnaire about knowledge of heart disease and the scores on the CHD Knowledge Tool for Women, suggesting that there was no association between these two measures of CHD knowledge.

Additionally, as expected, women without CHD scored approximately as low on health behaviors as participants in previous studies (Oliver-McNeil & Artinian, 2002), suggesting that they are engaging in few behaviors to promote their overall health. Given that women without CHD in this sample scored in the middle on perceived risk of CHD,

this data also supports other researchers who found that people often engage in behaviors to improve their lifestyle when they perceive their risk to be significant for the development or progression of a disease (Strecher & Rosenstock, 1997; Pender, 1996).

Most of the women in this total sample were minimally depressed. I anticipated that most women would be depressed given that previous researchers found higher self-reported rates of depression among older adults (Alexopoulos & The PROSPECT Group, 2001; Blazer, Hughes, & George, 1987; Blazer & Williams, 1980), particularly among women (Bebbington, 1998; Nolen-Hoeksema, 1990; Sprock & Yoder, 1997; Wolk & Weissman, 1995; Weissman, Bland, Joyce, Newman, Wells, & Wittchen, 1993; 1987; Weissman & Klerman, 1977). One possibility for this discrepancy may stem from the fact that this sample was a convenience sample of volunteers. There may be differences between those women who volunteered for the study and those who did not. For instance, perhaps the women who did volunteer were more energetic about life and had better coping mechanisms for stresses, while those who did not volunteer may have had more depressive symptoms, such as lack of motivation, apathy, loss of interest in activities, and other symptoms of depression that interfered with their desire to participate. In fact, the most recent statistics on depression in South Carolina, where the majority of the women in this sample lived, report that 11.6% of adults over age 65 have been diagnosed with a depressive disorder (CDC, 2006). In the current total sample, only one woman scored in the severe range on depression. According to the CDC (2009), older adults are often undertreated and even misdiagnosed, as many healthcare professionals assume depressive symptoms are a normal response to aging. Thus, many

older adults do not realize they suffer from depression and, consequently, do not seek treatment (2009).

In fact, in this study, women who were more depressed were more likely to have CHD. This finding is important because it supports other researchers who found similar associations between depression and CHD (Frasure-Smith & Lesperance, 2005). This association is also important to consider because among healthy individuals, depression has been found to be a risk factor for cardiovascular disease development (Barth, Scumacher, & Hermann-Lingen, 2004) and poor outcomes from CHD after the initial heart attack (Frasure-Smith & Lesperance, 2005; Bankier & Littman, 2001). This finding further supports the need for physicians and clinicians to assess for symptoms of depression in women with CHD. Particularly, in addition to CHD risk factors, it seems important for physicians to specifically assess for depression in older women given that many primary care physicians are hesitant about diagnosing depression in older adults (Wood, Pill, Prior, & Lewis, 2002; Rost, Smith, Matthews, & Guise, 1994) despite that many physicians are the primary providers for diagnosing and treating depression in older adults (Harman, Crystal, Walkup, & Olfson, 2003). Nearly half of the women in this sample reported feeling very comfortable discussing heart disease concerns with their physician. Perhaps older women may also feel more comfortable in discussing depressive symptoms with physicians who discuss them openly with their older patients.

**Women without CHD**

For both women without and women with CHD, only small associations were found between the overall PRHDS and the overall scales of the CHD Knowledge Tool for Women, the HPLP – II, and the BDI – II. However, for women without CHD, the

more a woman perceived fatal outcomes to be associated with CHD, the more knowledge she had about CHD. This relationship suggests that women who understand more about CHD may also believe there to be more dangers that accompany CHD. There was also a relationship between women who believed CHD risk to be unknown and delayed in its onset and knowledge about heart disease, suggesting that women who perceive CHD to be delayed or unknown had more knowledge about CHD. Together, these findings are important because they highlight beliefs about how women perceive their personal risk to be in developing CHD.

In fact, despite older age being a risk factor for CHD development, previous researchers found that older women perceive their risk of developing CHD to be as great as for younger women (Moran, Maaocco, Fiscus, & Koza, 1989). Others found that women often significantly underestimate their risk for CHD development (Fiant, et al., 1999). Beliefs about the development of CHD may relate to how much knowledge women have about the facts and statistics about CHD. That is, if women do not perceive their risk of CHD to be high and do not have much knowledge about CHD, this lack of information may place them at higher risk of developing cardiac occurrences in the future because they many not what behaviors to engage in to try to prevent CHD development.

Furthermore, in women without CHD, a small association was found between women who perceive their risk of CHD to have fatal outcomes and depression. Although the association was small and not significant at the .01 level, it might be worth discussing. This association suggests that women who perceive their risk of heart disease to be fatal tended to have more depression or more depressive symptoms. This association may relate to emotional and behavioral responses to perceived fatalities. That

is, it may be that women who perceive their outlook regarding CHD to be negative also experience physical and affective changes. For instance, a woman who perceives death to result from CHD may experience less pleasure in life activities. Hamner and Wilder (2008) found that women in their study had a pessimistic outlook about CHD. They found that 90% of women believed that they had between a 41% and 80% likelihood of developing heart disease within the next ten years (Hamner & Wilder, 2008). It is also important to point out that it is well-known that older individuals in general often experience somatic and affective changes, which may be a factor in this association.

In fact, qualitative data supports no association between perceived risk of heart disease and depression. Most women interviewed believed that there was no relationship between their heart disease risk and depression. This information may suggest that many women may be unaware of the impact of depression on one's physical health. Interestingly, one woman recognized the mind-body connection. She said that she believes heart disease risk and depression are related; this woman described this relationship as resulting from stress that affects both the heart and the mind. Furthermore, three women said that there could be a relationship between these two factors in others and one woman said that although there is not a relationship for her personally, she believes there is a relationship in her husband's case because she reported watching him suffer from depression after his heart surgery. For these women, it may be easier to observe in others the impact of depression on the physical body and more difficult to notice it occurring to themselves

In women without CHD, women who perceived their risk of CHD to be unknown and delayed in onset tend to engage in more health behaviors. Specifically, lack of

certainty about CHD occurrence was significantly associated with spiritual growth. This finding makes sense given that many people engage in spiritual acts, particularly during times of uncertainty and stress, and given that the majority of the sample is from the South, where nearly two million residents report that they are affiliated with a religious organization (ARDA, 2000).

Additionally, although not significant at the .01 level, a small association that might be worth discussing was found between health promoting behaviors and depression. This association suggests that the more depressed women without CHD were in this sample, the less they engaged in health preventive behaviors. This idea is consistent with what is commonly known about people with depression, as they tend to have more apathy about activities and about life in general, as well as less energy and less interest in activities. This association seems important because it supports a moderate connection between depression and health behaviors. Researchers have found that behavioral factors, especially physical inactivity, significantly explain relationships between depressive symptoms and cardiovascular-related occurrences in individuals with CHD (Wooleyet al., 2008). Others have found that individuals with depressive symptoms tend to engage in fewer health promoting behaviors, namely healthy diet, physical activity, and medication adherence (Gehi, Haas, Pipkin, & Wooley, 2005; see also Ruo, Rumsfeld, Pipkin, & Whooley, 2004; Ziegelstein et al., 2000).

**Women with CHD**

Although not a particular focus for this study, there were some important findings worth briefly discussing. Women with more depression engaged in less health promoting behaviors, which is an important finding because women with CHD and

depression are at significant risk of future cardiac occurrences, including death (Van der Kooy, et al., 2007). Specifically, women with CHD and depression tended to engage in less physical activity, less healthy eating habits, less spiritual growth, tended to have less investment in interpersonal relations, and tended to have fewer ways to manage stress. Others have found that individuals with depressive symptoms tend to engage in fewer health promoting behaviors, namely healthy diet, physical activity, and medication adherence (Gehi, Haas, Pipkin, & Wooley, 2005; see also Ruo, et al., 2004; Ziegelstein, et al., 2000). Specifically with older adults, researchers have found that higher levels of depression are related to a lack of physical activity (Kritz-Silverstein, Barrett-Connor, & Corbeau, 2001) and a loss of interest and involvement in pleasurable activities (Benyamini & Lomranz, 2004). In study participants with CHD, women with less engagement in interpersonal relations had more depression. Researchers have found that the long-term management of cardiac events include both social support and behaviors that an individual learns to increase health (Rosanksi, 2005), which may be obtained from social support groups that teach individuals positive health behaviors (DiMatteo, 2004). Thus, for women with CHD and depression, support groups may not only help older women learn new health promoting behaviors, but also instill hope and facilitate motivation to practice these new behaviors routinely. In fact, high levels of social support have been found to aid in protecting against the impact of depression during the first year after a heart attack and to be predictive of decreased depression during this time among depressed individuals (Frasure-Smith et al., 2000).

Taken together, these significant relationships between health behaviors and depression reiterate the importance of educating women about positive health behaviors

and depression; it also supports the need for clinicians and physicians to become involved in implementing not only support groups for older women, but also psycho-educational programs for older women and their family members. For instance, providing educational information about health promoting behaviors and depression to older women in churches may help to reach larger numbers of women. In other words, discussing positive health behaviors and depression may encourage older women in church groups to become more involved in healthier cooking and/or encourage regular walking or exercising groups among older women several times a week. Targeting churches or other religious groups may help to reach larger numbers of women who may not see their physicians regularly.

That is, some women may not report all physical and psychological concerns to their healthcare professionals or even adhere to regular check-ups. Particularly, they may not be aware that some physical symptoms they experience are the result of depression rather than older age. In fact, depressive symptoms are often mistaken by physicians and other healthcare professionals as normal occurrences in response to diseases or major transitions (CDC, 2011). Thus, it is important for physicians to appropriately assess older adults for depression, particularly if they have heart disease.

**Educational Level**

One reason for little to no associations on some of the instruments for both women without and with CHD may relate to education level in that women with less education may have experienced more difficulties in understanding the items on the questionnaires. According to the latest U.S. Census Bureau (2009) on educational attainment in South Carolina, 73.3% of adults 65 and older had a high school education

or higher and 19.6% had a bachelor's degree or higher. The educational attainment data for North Carolina was very similar with 72.9% of older adults reporting a high school education or higher and 18.7% reporting a bachelor's degree or higher. The education level of the participants in this study was much lower with 69.3% of the women having a high school education or less and 15.4% has a bachelor's degree or higher. The majority of the study participants came from a small, rural county in South Carolina. For study participants without CHD, the mean scores for women with less than a high school education were lower for perceived risk of CHD, for CHD knowledge, and health promoting behaviors. For women without CHD, depression scores were higher for those women with less than a high school education than those women with a high school education or higher. For women with CHD, those with less than a high school education had lower mean scores on the CHD knowledge instrument and health promoting behaviors in comparison to the mean scores of those with a high school education or higher.

It may be that women with less education have fewer available opportunities to find resources to help them to better care for themselves. That is, women with less education, particularly women in rural areas, may have limited physical and financial access to healthcare. Given that the educational attainment in South Carolina for older adults is low (CDC, 2006) and that the poverty rate for older adults is estimated to be 11.9% (U. S. Census Bureau, *n.d.*), it seems that women with less education may not be able to afford to have regular checkups with their physician.

Additional analyses indicated that educational level did influence responses on the PRHDS and the BDI – II for women without CHD. Although the BDI – II has a fifth

grade reading level (Conoley, 1987), the educational level of the validity sample for the PRHDS included 31% participants with a high school education and 44% with education beyond high school (Ammouri & Neuberger, 2008). As a result, the reading level of the PRHDS may have been too high for some participants in this sample. Perhaps this instrument could be revised to have a lower reading level; it is important to have instruments that assess perceived CHD risk at a level that is appropriate for individuals of all educational levels. For the BDI – II, differences in educational level may have resulted from the order in which the instrument was placed given that it was the last questionnaire in the packet. Perhaps women were fatigued when answering the items on this questionnaire and did not have the cognitive energy to think about the items as clearly as they did with other questionnaires. These differences may also have resulted from perceptions about depression. That is, some women may perceive depression to be a topic to keep secretive, which is common in areas where individuals are less educated about mental health like the rural South.

In fact, researchers suggested that individuals with more education seem to have less depression and anxiety over time and indicated that education may protect against depression and anxiety as a person ages (Bjelland et al., 2008). Consequently, it is important for clinicians and researchers to design and implement interventions to educate older adults of all educational levels about depression, CHD knowledge, and CHD risk factors. Perhaps the media could help play a role in educating older adults, such as through local television and radio programs, as well as local newspapers. For example, given that many older adults watch or listen to local media stations, a healthcare professional could discuss the symptoms of depression specifically among older adults on

a local television channel and provide resources for older adults to seek if they experience such depressive symptoms. The same type of advertisements could be conducted to provide information about CHD risk factors for older women and men.

Furthermore, for women with CHD differences were found between CHD knowledge and educational level. This finding makes sense given that some women reported difficulties understanding the items on this instrument. It is important that women understand facts and statistics about CHD, particularly modifiable behaviors, so that they are educated about what they can do to take care of themselves. While having knowledge about CHD is not enough to prevent its progression or development, it may increase motivation to make more positive health choices, particularly with regards to diet, physical activity, and adherence to prescribed medical regimens.

Study participants with CHD were more likely to be depressed and were more likely to engage in fewer health promoting behaviors than women who were not diagnosed with CHD. This information is important for healthcare professionals and clinicians working with older women to consider, particularly as they assess for depression and as they implement treatments for these women. Health promoting behaviors may be also important for clinicians and healthcare professionals to assess, especially in women with CHD. For women without CHD, perceptions about personal CHD risk factors is important for healthcare professionals to assess because women may not know be aware of their own personal risk factors for CHD.

Specifically, the need for older women to be educated about their risk factors for CHD development and prognosis, depression, and health behaviors is clear. The need for physicians, healthcare providers, and clinicians need to provide information about CHD

to older women in a way that is both accessible to them and understood by them is important. One way in which healthcare professionals may determine more accurately how much information older women have about their risk factors for CHD development or progression, health promoting behaviors, and depression is to provide brief questionnaires about their health perceptions and knowledge to their patients at each visit. Such questionnaires could consist of items asking about the amount of physical activity obtained over the last week, for example, or about the likelihood of engaging in health behaviors (i.e., poor diet, smoking) that may lead to the development of CHD in the future. These questionnaires could be kept as part of the woman's medical record where healthcare professionals can more readily access the information. This information could then be matched to the actual risk factors and depressive symptoms reported in the patient's medical record. Any discrepancies between actual and perceived risk of CHD and/or depression could be discussed directly with the patient.

Additionally, local media stations may be specific interventions that may help promote both more education on CHD risk factors, CHD knowledge, positive health behaviors, and depression; particularly the impact that depression can have on cardiovascular-related diseases. For example, providing a television or radio program about the symptoms and relationship of depression to CHD and other medical illnesses may help to educate older adults about both depression and CHD, for example. By advertising the information more publicly and openly, not only may older adults become more educated on their health and positive health behaviors, but it may also decrease the stigma that is commonly associated with admitting mental illnesses. Often, older women have many roles aside from cooking, taking care of family members, and providing

emotional support, including educating younger generations about diet and recipes and setting examples for them to follow in the future. Such roles are important because of the influence these grandmothers can have on health behaviors among their grandchildren and great grandchildren. As a result, targeting older women in churches, religious groups, and local media may help to provide education about physical and mental health to not only older women, but also their families.

**Limitations**

There are several limitations to this study. First, I did not use an initial screening to identify women without and with CHD. Given that women with heart disease may have had difficulties answering the questions on the PRHDS, being able to identify women without CHD would have been more appropriate in looking at perceived risk of being diagnosed with CHD in the future. The PRHDS may not have been a valid instrument for use with individuals between 65 and 95 years of age. According to the authors of the instrument, the mean age for which the PRHDS was considered valid was 33 years of age; the age range of participants in the study assessing the psychometric properties of this measure was 15 to 75 years (Ammouri & Neuberger, 2008). Further, the authors reported the reading level of this instrument to be appropriate for 18 to 60 year-old respondents (2008). As a result, this instrument may not be the best instrument to have used with the age range of my study. Although there is no other instrument to my knowledge assessing perceptions on the likelihood of being diagnosed with CHD, I could have created questions for the participants to understand more about their personal perceptions about being at risk for CHD. For instance, one question could have asked participants the following: On a scale of zero to three, with zero being not at all, one

being a little likelihood, two being average likelihood, and three being a strong likelihood, where do you rate your likelihood of being diagnosed with CHD?

Second, although the authors of the CHD Knowledge Tool for Women identified the reading level to be consistent with a high school education, the instrument was normed on a sample of 30 to 65 year-olds (Thanavaro, Thanavaro, & Delicath, 2010). As a result, this instrument may not have been the most valid instrument to use with women 65 years of age and older and for women with less than a high school education. However, previous studies using an older version of the instrument for women included women up to 85 years of age (Oliver-McNeil & Artinian, 2008).

Third, there is no certainty that participants who reported having or not having a diagnosis of heart disease understood the definition of heart disease. That is, they may have been diagnosed with high blood pressure, for example, and consider that to be heart disease. A measure of health literacy could have been helpful because general literacy is not the same as health literacy. Another possibility is that I could have provided a definition of heart disease beside the question to clarify the meaning.

Fourth, I did not ask participants on the demographics questionnaire about their socioeconomic status (SES), which is commonly known to be associated with both depression, health problems, and limited access to healthcare. The reason I did not ask about SES is because some older women were asked prior to the creation of the demographics questionnaire their perceptions on an itemasking them to report their average income. Each of these women reported that they would not feel comfortable answering a question asking this information. In order to reduce the likelihood of making participants feel uncomfortable, a question about SES was left out of the demographics

questionnaire. However, another possible way to ask this question could have been by asking them to identify the type of health insurance they have and asking if they use Medicaid.

Fifth, I only utilized self-reported data in the study, which can affect the reliability of participants' responses on the questionnaires. Fifth, this study is not experimental, which limits any generalizability to older women outside this sample. I used a convenience sample for the study, which also limits the ability to generalize the results to older women outside the sample. The sample consisted of older adults residing in Oklahoma, South Carolina, North Carolina, and Virginia and did not include individuals from all socioeconomic statuses, educational statuses, racial backgrounds, and geographic regions. Most of the women identified themselves as White or Caucasian. Additionally, I included some qualitative data from a related study, which introduces subjectivity and limits the generalizability of the information presented from this related study. However, the data collected from this related study seems to highlight interesting information from the viewpoints of the eight women interviewed that supplements my findings about the relationships between perceived risk of CHD and depression. Finally, there are numerous items on each questionnaire, which may have resulted in fatigue and may be a reason why not all items were answered by all participants. However, I made an effort to accommodate those participants who became fatigued by collaborating with them on another date and time to complete any remaining questionnaires. Finally, I substituted the means for missing data items, which could have impacted the reported reliabilities of the instruments. However, I examined the reliability of the instruments used in my study without the means included, and the reliability estimates were similar to those reported

using the means. Despite these limitations, I believe that this study can lead to further inspiration for the additional exploration of depression, perceived risk of CHD, knowledge of CHD, and health promoting or health preventive behaviors to try to prevent CHD among women across other regions and areas of the United States.

Finally, although initial screening questions were presented to participants for a related study, there is a limitation that is important to mention. Two of these screening questions used the term clinical depression, which may have not been fully understood by the participants. That is, some women may think that this term meant any diagnosis of depression (e.g., depressive episode during bereavement). Perhaps providing a written and verbal definition would have been helpful.

**Future Directions and Importance of Study**

The information obtained from this study may be important for physicians and mental health clinicians to consider in their work with older women. Clinically, perceptions about heart disease risk seem important for physicians working with women to know; perhaps assessing a woman's beliefs about CHD may help physicians to further understand how they can better educate women on CHD risk factors. Specifically, future research may be needed to tease out whether the association between perceived risk of fatal outcomes from CHD and depression are because of perceived risk of CHD or because of general aging factors. Directly assessing a patient's beliefs about CHD may enlighten physicians and healthcare professionals on what patients know about not only their actual risk factors but also their knowledge about CHD and health preventive behaviors.

Additionally, although there were mixed results from the related study interviews, further researchers may want to examine why the majority of women perceive there to be no relationship between heart disease risk and depression. Understanding more about perceptions on CHD risk may also enlighten healthcare and mental health professionals on the beliefs older women have about both physical and mental health. That is, specifically with mental health, healthcare professionals may be able to identify potential biases in perceptions among older women and provide these women with education about mental health knowledge, services, and treatment.

Future researchers and clinicians may want to further explore the influence of spirituality in perceptions on CHD among older women, particularly in rural areas where spiritual practices are often important. That is, it may be important to further examine the possibility that spiritual practices act as a buffer against negative outcomes associated with CHD. In fact, Delgado (2007) found that spirituality may protect against stress in individuals with chronic illnesses. Examining beliefs about spirituality as a coping mechanism for CHD may lead to more understanding about how older women, in particular, cope with the CHD. This understanding may lead researchers and clinicians to develop interventions that target older women.

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# APPENDICES

## Review of Literature

The research available on health perceptions and beliefs of women 65 years and older is limited. Specifically, the available literature on the relationship between perceptions of heart disease risk and depression in women 65 years and older is scarce. My purpose of the following review is to delineate the following important points: 1) Understandings of heart disease, heart disease prevalence, heart disease risk, and perceptions of heart disease risk among older women; 2) The need for additional research on relationships between perceived heart disease risk and depression in older women; 3) Available literature on studies examining heart disease and depression associations; and 4) Available studies examining CHD knowledge among women. I will also discuss data on heart disease risk in Oklahoma and South Carolina, as well as the national data. By reviewing these topics, I will further support the significance of my current study.

**Descriptions of Cardiovascular Diseases**

Cardiovascular disease (CVD) is the overarching classification for heart-related and blood vessel-related diseases and forms the umbrella over diseases affecting the cardiovascular system (Mackay & Mensah, 2004). The main types of CVD listed alphabetically are 1) *Aneurysm or aneurism* (i.e., a localized, dilated blood-filled artery at the base of the brain or in the aorta); 2) *Angina pectoris* (i.e., severe chest pain due to ischemia or lack of blood and oxygen supply to the heart muscle as a result of either obstruction or spasm of the heart's arteries); 3) *Atherosclerosis* (i.e., thickening of the arterial walls as a result of a buildup of hardened plaque deposits that limit blood flow in the arterial blood vessels); 4) *Cerebrovascular accident, or commonly termed, stroke* (i.e., a rapid loss of brain functioning due to disruptions in the blood supply to the brain from either a blood clot inside a blood vessel or a clot that breaks from a blood vessel and forms a clot in another part of the body; 5) *Cerbrovascular disease* (i.e., damage to the blood vessels supplying blood to the brain, such as high blood pressure); 6) *Heart failure* (i.e., damage to the structure or function of the heart that impairs the heart's ability to supply efficient blood flow); 7) *Coronary heart disease* (i.e., failure of adequate coronary circulation to the heart muscle and surrounding tissue; 8) *Myocardial infarction or heart attack* (i.e., interruption of blood supply to part of the heart resulting in the death of heart cells); and 9) *Peripheral artery disease, or termed peripheral vascular disease* (i.e., obstruction of large arteries in the arms and legs) (Mackay & Mensah, 2004).

The most frequently occurring cardiovascular diseases in descending order include coronary heart disease, stroke, high blood pressure, and heart failure (American Heart Association, 2009). In fact, physicians and researchers frequently use the terms

coronary artery disease (CAD), coronary heart disease (CHD), and ischemic disease interchangeably to describe problems with the coronary arteries that supply blood and oxygen to the heart muscle either through atherosclerosis or nonatherosclerotic causes (e.g., ischemia due to cocaine use, aneurysms in the aorta; Scheidt, 1996, as cited in Allan & Scheidt, 1996). These problems manifest as acute myocardial infarction, angina, or sudden cardiac death. Nearly all causes of CHD are the result of atherosclerosis, which can grow large enough to greatly decrease blood flow; if this hardened plaque ruptures, it causes a blood clot, which can completely block blood flow through a blood vessel to the heart, causing a heart attack (1996).

**U. S. Heart Disease Information and Data**

In 2006, the AHA estimated that 80,000,000 American people suffer from at least one form of cardiovascular disease (AHA, 2009). In 2005, cardiovascular disease claimed more lives than cancer with 864,480 deaths to cardiovascular diseases and 559,312 deaths to cancer (2009)—that is 35% of all deaths were due to cardiovascular-related diseases. According to the AHA (2009), coronary heart disease (CHD) is the leading cause of death in the United States today. It is estimated that 16, 800,000 living Americans have a history of heart attacks and/or angina pectoris and that 1.26 million Americans this year will suffer from their first heart attack or have a recurrent one. Approximately 309,000 people die suddenly from a heart attack without the chance for hospitalization and treatment. (2009).

**Cost of CHD on Americans**

The cost of cardiovascular diseases is substantial. According to the 2009 statistics listed in the *Fact Book Fiscal Year 2009* (2009) of the National Heart Lung and Blood

Institute (NHLBI), the estimated direct cost (i.e., expenses for hospitalizations, nursing home care, medications, home care, physician services, and other related professional services for the treatment of CVD) for cardiovascular disease in 2009 was $313.3 billion and indirect costs was $161.5 billion. Specifically with CHD, the 2009 direct and indirect costs were estimated to be $179 billion (Lloyd-Jones, Adams, Carnethon, De Simone, Ferguson, Flegal, Ford, Furie, et al., 2009). In 2010, the direct cost of CVD was $324 billion and indirect cost was $179 billion (NHLBI, 2009).

**Women and CHD**

Heart disease is a continuing problem today in American women (AHA, 2007, 2009). According to the AHA statistics in 2007, 39% of female deaths in the U. S. resulted from cardiovascular diseases, including stroke and CHD, and cardiovascular diseases represented the number one disease in hospital discharges for women. Even more striking is that cardiovascular diseases claimed more lives in 2006 than all forms of cancer combined—cardiovascular diseases claimed 831,272 and all cancer forms claimed 599, 888 lives (AHA, 2009). Most startling, was the 2004 statistic that indicated that one in five physicians did not realize that more women die from all cardiovascular diseases combined than men (Mosca, Appel, Benjamin, Berra, Chandra-Strobos, et al., 2004). According to Brister and Turek (2001), women account for 53.5% of cardiovascular disease deaths and report that they are twice as likely as men to die at presentation from the disease than men.

In fact, throughout much of the previous cardiac psychology literature, studies conducted on coronary heart disease have predominantly pooled men as the participants yet generalized applicability to both men *and* women (Bankier & Littman, 2002; Eaker,

1989). Other studies have included women but utilized very small sample sizes, making it almost impossible to detect accurate gender differences (Czajkowski, Hill, & Clarkson, 1991). According to Yusuf, Zucker, and Peduzzi (1994), only 3.2% of all randomized trial studies in the 1970s and 1980s on CHD included women. Further, of the 500,000 women who died of cardiovascular diseases in 1997, 97,000 were due to myocardial infarction (i.e., heart attack) alone (von der Lohe, 2003). The World Health Organization Statistics (1997) estimate that a woman's chances of dying from CHD during her lifetime is 31% in comparison to 2.8% from breast cancer, a typically greater worry for most women. Despite this unsettling data, Americans in general are living longer into older age (U. S. Bureau of the Census, 1996), which leads to the need for more research focusing on factors affecting cardiac diseases that may help generate effective strategies for the prevention of diseases. Because women tend to live longer than men, it seems important for these needs to be addressed in women.

Moreover, in the research that has been conducted, researchers have shown that women have a poorer prognosis post-MI than men and typically suffer more from hypertension, congestive heart failure, and diabetes (Greenland, Reicher-Reiss, Goldbourt, & Behar, 1991; see also Carney, Freedland, Smith, et al., 1991, as cited in Polk & Tasneem, 2005; Dittrich, Gilpin, Nicod, et al., 1988), even when these variables are adjusted for baseline distinctions (Vaccarino, Parsons, Every, et al., 1999, as cited in Polk & Tasneem, 2005). Researchers have shown that post-MI women report more psychological and psychosomatic complaints than men, even when controlling for age and comorbidity discrepancies (Wiklund, Herlitz, Johansson, et al., 1993, as cited in Polk & Tasneem, 2005). Researchers have also shown that women tend to have more severe

depressive symptoms that last longer or to have more diagnosed depressive disorders in comparison to men (Drory, Kravetz, & Hirschberger, 2003; see also Stern, Pascale, & Ackerman, 1977, as cited in Polk & Tasneem, 2005).

Furthermore, in a cohort study comparing 677 men and women hospitalized for a myocardial infarction between October 1, 1990 and September 30, 1992, participants were assessed for treatment (e.g., cardiac medications prescribed, number of physician visits, revascularization, and diagnostic testing), physical health status (i.e., as assessed by the physical component summary (PCS from the Medical Outcomes Study Short Form 36), reinfarction, and mortality during the year following the myocardial infarction. At the follow-up, researchers found that reinfarction and mortality rates were low for both men and women; however, women demonstrated a quicker decrease in physical health than men.

**Physiological and Biological Risk Factors for CHD**

Moreover, there are numerous factors that place individuals at risk of developing CHD or for experiencing CHD-related events. Medical research identifies biological and physiological risk factors that increase the likelihood of CHD event occurrence and distinguishes uncontrollable and controllable or modifiable biological risk factors (AHA, 2009). The factors one cannot change include 1) Age; 2) Genes; 3) Race; and 4) Gender. The modifiable risk factors that can be altered include 1) Tobacco smoking; 2) Blood cholesterol levels, including high levels of low-density lipoprotein (LDL) such as cholesterol and fats and low levels of high-density lipoprotein which carry the cholesterols and fats to the liver for removal ; 3) Hypertension (i.e., high blood pressure) either the systolic pressure (i.e., heart pumping) or diastolic pressure (i.e., heart relaxing);

4) Physical inactivity; 5) Excess body fat (i.e., being 35% or more above healthy body weight); and 6) Improper management and treatment of diabetes mellitus (AHA, 2009; Scheidt, 1996).

More specifically with older adults, left ventricular hypertrophy (LVH; i.e., enlargement of the muscle tissue in the left ventricle of the heart responsible for pumping the heart's blood), high blood pressure, and diabetes mellitus type 2 increase with age (Kannel & Vokonas, 1992) and are significantly associated with CHD in adults over the age of 65 (Kannel & D'Agostino, 1995). Absolute risk of developing these risk factors is great among older adults (Kannel & Levine, 2003). Among older adults at risk for CHD, heart pulse pressure resulting from stiffening of the arteries is also an independent risk factor in addition to pervasive athersclerosis (Franklin, Kahn, Wong, Larson, & Levy., 1999). Other biological risk factors among older adults include weight gain and excess abdominal fat leading to problems with the functioning of insulin, ultimately leading to the increase in atherosclerosis due to diabetes, high blood pressure, and insulin resistance (1999; Reaven,1988). Further, elevated levels of homocysteine, a peptide (i.e., shorter amino acid) that corrodes essential cellular protein functioning, were found in 29% of older adults and 10% of these high concentration levels were associated with cardiovascular disease (Aronow & Ahn, 1997).

**Oklahoma and Heart Disease**

Oklahoma is a rural state with a high incidence of heart disease. According to the most recent statistics on heart disease and stroke, the 2004 age-adjusted data indicates that Oklahoma ranks 51 out of the 50 states, District of Columbia, and Puerto Rico in cardiovascular disease deaths and 52 in the number of CHD deaths (Lloyd-Jones, Adams,

Carnethon, De Simone, Ferguson, Flegal, et al., 2009). Specifically, 367.6 per 100,000 Oklahomans died of cardiovascular-related diseases of which 208.8 per 100,000 were due to CHD (2009). The number of males who died from CHD in 2006 was 315.1 per 100,000 in Oklahoma, which is much higher than the national rate of 248.1 per 100,000. The number of females who died from CHD in 2006 was 200.2 per 100,000, which is also much higher than the national rate of 162.2 per 100,000 females. The Centers for Disease Control (CDC) reported in the National Vital Statistics Report of 2008 that 32% of the state's deaths (i.e., 11, 230) in 2002 were the result of heart disease.

**South Carolina and Heart Disease**

South Carolina is another state with high incidences of heart disease, particularly among minorities. According to the most recent statistics on heart disease and stroke, the 2004 age-adjusted data indicates that South Carolina ranks 40 out of the 50 states, District of Columbia, and Puerto Rico in cardiovascular disease deaths and 51 in the number of deaths to stroke (Lloyd-Jones, et al., 2009). According to the National Vital Statistics Report (CDC, 2008), South Carolina heart disease accounted for 26% of the state's deaths in 2002.

Further, The Behavioral Risk Factor Surveillance Survey system in 2005 reported that 31.4% of state residents had high blood pressure and 37.2% of those screened had high cholesterol (South Carolina Department of Health and Environment Control, 2006). Likewise, an astonishing 65.4% of South Carolinian residents were overweight or obese in 2006, a significant contributor to heart disease. Furthermore, 154 per 100,000 African-American deaths in 2004 in South Carolina were the result of coronary heart disease, an increase of nearly 50 per 100,000 deaths to coronary heart disease within a year. In

considering other races including whites, 136 per 100,000 deaths resulted in 2004 from coronary heart disease in South Carolina. There were 388 per 100,000 deaths due to all cardiovascular disease combined in 2004 for African-Americans and 282 per 100,000 for whites (2006).

**Perceptions on CHD Risk Among Older Women**

Furthermore, one possible hypothesis for increased risk of CHD occurrence and recurrence pertains to perceptions on CHD risk. In fact, women do not perceive their risk of a heart attack to be as great as men, particularly if women consider themselves to appear healthy (e.g., appropriate weight, healthy diet) (Krueter & Stretcher, 1995). It is also well-known that women traditionally put their family's health/healthcare (Richards, Reid, & Watt, 2002; Schoenberg, Peters, & Drew, 2003), household roles, and family responsibilities above their own needs, despite their own medical problems, which typically increases stress levels, decreases the chances of seeking medical assistance for their own recurring health problems, and subsequently increases the chances of future problems. Further, if women are unable to resume these roles due to a medical illness (e.g., CHD), their level of psychological stress may also increase.

Similarly, women have larger numbers of social ties than men (Shumaker & Hill, 1991, as cited in Uchino, 2004) and are more relationship-oriented than men (Taylor, Klein, Lewis, Gruenewald, Gurung, & Updegraff, 2000, as cited in Uchino, 2004), suggesting the importance of social support as a risk reducer for future myocardial infarctions. On the other hand, carrying such social roles (e.g., caregivers, friends) can also result in psychological stress, which has profound effects on CHD prognosis, including provoking a silent myocardial ischemia in patients with CHD and even

predicting future mortality (Rozanski, Bairey, Krantz, Friedman, Resser, Morell, Hilton-Chalfen, Herstrin, Bietendorf, & Berman, 1988, as cited in Uchino, 2004). While it is important to consider the fact that social support may be a buffer at times and a risk factor at other times, it is equally important to identify the perceptions of heart disease risk.

**Perceived Risk of CHD**

In a study researchers examined the association between perceived vulnerability to breast cancer, coronary heart disease, and osteoarthritis, as well as objective risk through the utilization of epidemiological models of risk (Gerend, Aiken, West, & Erchull, 2004); additionally, these authors identified psychological factors that could influence perceived vulnerability formation beyond the medical risk factors, specifically in women. These researchers used a sample of 312 females between 40 and 86 years of age and interviewed them by telephone between July 1998 and May 1999 (2004). These researchers utilized the epidemiological Gail model (Gail, Brinton, Byar, Corle, Green, Schairer, et al., 1989) to predict breast cancer risk, the CardioRisk model from the New England Research Institute (Smith, McKinlay, & McKinlay, 1989, 1991; Avis, Smith, & McKinlay, 1989) to predict medical risk for CHD, and the Ribot, Pouilles, Bonneau, and Tremollieres (1992) vertebral bone mineral density test to assess osteoarthritis. One direct comparative risk item (i.e., comparison of self to other women of the same age) and three absolute items (i.e., "own chance" of developing the disease, "own susceptibility" to getting the disease, and "own numeric" or percentage of belief to getting the disease) assessed perceived susceptibility; these each of the three diseases used these risk factors, adapted from breast cancer risk perception scales (Aiken, et al.,

1995; Dolan, et al., 1997), as well as from those risk factors in Weinstein (1982, 1984, 1987). Perceived prevalence, severity, preventability, controllability, and heritability of each disease as used by Weinstein (1982, 1987) assessed the psychological variables, as well as cognitive heuristics, including the availability heuristic and representativeness heuristic, as assessed from media communications or self-reported information from physician about the disease. The Stress Reaction Scale of the Multidimensional Personality Questionnaire (Smith & Reise, 1998; Tellegen, 1982) assessed negative affect.

Furthermore, results revealed that beliefs about disease characteristics, objective medical risk factors, and cognitive heuristic processing, together, predicted perceived vulnerability. Specifically, results revealed that women in this sample were aware of specific medical risk factors. Interestingly, the highest proportion of variance among the diseases was heart disease (i.e., 31%) in terms of awareness of medical risk; however, the direction and magnitude did not chart onto risk weights in the epidemiological models in this study. Older women saw themselves as less vulnerable to disease than younger women and many believed that protective factors (e.g., vitamins) not listed in the risk models were significant for their health. Perceived vulnerability was related to perceived prevalence of the disease and perceived similarity to other women with the disease across all three diseases. The authors also noted that the results of this study indicate that psychological factors are significantly related to women's beliefs about susceptibility to disease above medical factors (Gerend, Aiken, West, & Erchull, 2004). Although this study utilized self-report of medical risk factors and had a sample of women particularly interested in women's issues, this study provides powerful support for the need for more

research to be conducted on perceived risk, particularly between the genders and among older adults. Because older women are particularly vulnerable to specific psychosocial variables like depression and particular medical illnesses as heart disease, this study validates the need for more research to examine the relationships between perceptions of heart disease risk and depression in women.

Furthermore, other researchers conducted a population-based study to investigate the risk perceptions of developing strokes among older adults and found these risk perceptions to be low (Harwell, Blades, Oser, Dietrich, Okon, Rodriguez, et al., 2005). This study included a sample of Montana residents 45 years of age and older in order to examine community perceptions of stroke. Using telephone surveys with a random selection of participants between February and April 2004, questions included the Behavioral Risk Factor Surveillance System Survey examining age, gender, race, and educational status, as well as smoking status, history of heart attack or other cardiovascular diseases, stroke, diabetes, high blood pressure, and high cholesterol (Centers for Disease Control and Prevention, 2008).

Results of this study indicated that only 39% of participants believed themselves to be at risk of having a stroke—that is 56% who did not believe they were at risk. Surprisingly, 46% indicated having two or more risk factors and 22% indicated having more than three. Even more surprisingly, perceived risk for stroke was higher among the 45 to 64 age group (i.e., 61%) than the age group 65 and older (i.e., 42%). The authors indicated that the awareness of perceived risk for stroke among older adults residing in rural areas is low. Limitations that the authors noted included the use of telephone surveys, in which some older adults in Montana may not have a telephone, as well as the

tendency for recall bias in self-reporting information. Despite these limitations, the authors noted that the authors of prior studies on risk factors and cardiovascular disease indicate accuracy in self-report (Kehoe, Wu, Leske, & Chylack, 1994; Jackson, Jatulis, & Fortman, 1992, as cited in Harwell, et al., 2005). This study highlights the need for future research to assess self-perceptions on risk for developing cardiovascular-related diseases among older adults, particularly those older individuals in rural areas.

Additionally, authors of another study examined risk perceptions for coronary heart disease among 883 rural primary-care practices in Maryland in order to investigate the associations among actual cardiovascular disease presence, major risk factors, and self-perceptions for coronary heart disease (Moran, Maaocco, Fiscus, & Koza, 1989). Utilizing a coronary risk-factor questionnaire designed specifically for this study, the authors divided the questionnaire into two sections, one of which concerned the health profile (i.e., blood pressure, height, weight, etc.) and the second of which concerned the exercise patterns, smoking habits, family history of heart disease, and personality type. Results of this study found that individuals without a history of cardiovascular disease were younger, employed, physically active, and had a higher educational and income status. Other results indicated that older adults viewed themselves at lower risk for heart disease than younger participants despite that the older adult group comprised 60% of the sample with cardiovascular disease. Those with a history of cardiovascular dysfunction perceived themselves to be at greater risk for coronary heart disease than those without this history; this finding was not affected by gender (1989).

The authors concluded that perceived and actual risk carried a discrepancy in this study and, thus, may need to be considered before preventive behaviors are implemented

(1989). This study highlights the need for risk perceptions to be examined, particularly among older adults, as those in this sample perceived their risk of future cardiovascular-related problems to be much lower despite having coronary heart disease. Other researchers also demonstrated that age is not an effect on the health perception of older adults (Mossey & Shapiro, 1982) but do not provide factors that may affect health perceptions; thus there may other factors (i.e., depression) that influence perceptions on health among older individuals.

Fiandt, Pullen, and Walker (1999) examined the risk perceptions of older women for CHD, cerebrovascular disease (i.e., stroke), breast and colorectal cancer, osteoporosis, and depression. Utilizing a community-dwelling convenience sample of 102 older women between the ages of 65 and 91, a computerized telephone interviewing system contacted these women asking them a series of questions about their actual risk factors for each of these diseases examined in this study. For CHD and stroke, they specifically addressed cholesterol levels, blood pressure levels, smoking status, whether they had a diagnosis of diabetes, family history, obesity, physical activity levels, and history of heart disease. For breast cancer, the researchers asked questions regarding age, family history, age of first pregnancy, age of menarche, age of menopause, obesity, history of breast disease diagnosis, socioeconomic status, and history of ovarian or endometrial cancer. For colorectal cancer, they asked about positive family history, previous gynecological cancer, history of ulcerative colitis or colorectal polyps. Measures for depression included number of stressful events throughout life, functioning status, and personal and family history of depression. The authors computed the actual risk scores to be the weighted sum of the present reported risk variables (1999).

With perceived risk, the researchers asked participants rated their risk as high, medium, or low in their comparison of themselves to other women their age regarding the likelihood that they will experience a heart attack, a stroke, develop breast cancer, develop colorectal cancer, suffer from depression, and develop osteoporosis (Fiandt, Pullen, & Walker, 1999). The 20-item Medical Outcomes Study Short-Form General Health Survey (MOS; Stewart, Hays, & Ware, 1988) assessed participants' perceptions on their health status. A demographics questionnaire was also administered examining age, income, educational status, geographic location, and overall health status (i.e., good, fair, or poor). Using Spearman rho correlations to examine the relationship between actual and perceived risk, the researchers found significant correlations for stroke, depression, and colorectal cancer, suggesting that participants' associations of perceived and actual risk for these diseases was high. However, for heart attack, osteoporosis, and breast cancer, women in this sample significantly underestimated their risk (1999).

Utilizing Pearson *r* correlations to consider those actual risk factors influencing perceived risk for each of the chronic diseases, the researchers found that family history influenced breast cancer and colorectal risk perceptions; history of hypertension influenced increased risk perceptions for stroke, ulcerative colitis, or polyps and increased risk for colorectal cancer; and history of depression was influential in perceptions of increased risk for depression (Fiandt, et al., 1999). Using Pearson *r* correlations for demographic variables correlated with perceived health status and risk perception, the researchers found that better health status was associated with lower perceived risk for all illnesses used in this study. Those participants who reported better mental and physical health, as well as role functioning also showed lower perceived risk

for heart attack and depression. Better mental health was also associated with lower perceived risk for osteoporosis. Better physical functioning was associated with lower perceptions for risk of breast cancer (1999).

The results of this study indicated that despite age and reported risk factors, half of the female sample underestimated their risk for those diseases for which they are most prone—heart attack, osteoporosis, and breast cancer. Interestingly, the women in this sample did not perceive family history of heart disease or depression to be risk factors in their lives for heart disease or depression (Fiandt, et al., 1999). The authors indicate that this finding suggests that life experiences has a larger impact on risk perception for these diseases than actual risk factors, as supported by the significant association of life experience with risk perception and the high associations between hypertension and perceived risk for stroke and personal history of depression and perceived risk for depression. However, women in this sample perceived their risk of breast cancer and colorectal cancer to be significantly associated with family history (1999).

Furthermore, Oliver-McNeil and Arinian (2002) conducted a study to describe the risk factor perceptions and risk-reducing behaviors among a sample of 33 women with a recent diagnosis of CHD. Participants were selected from a hospital list of women with diagnosed myocardial infarction. Participants were approached prior to discharge and those who agreed to participate were mailed questionnaires one week following discharge. The researchers developed a questionnaire addressing perceived risk factors, prior experience with CHD, previous experience with a cardiovascular education program, and demographic information. They also used the Coronary Heart Disease Knowledge Test (Smith, 1991), selecting 20 relevant items from the 40 items included in

this assessment. They also used the Health-Promoting Lifestyle Profile II (HPLP II; Walker, Sechrist, & Pender, 1996).

Utilizing descriptive statistics and Pearson *r* correlation coefficients, Oliver-McNeil and Artinian (2002) found that only one female identified age as a personal risk factor, one identified menopause as a risk factor, three identified obesity as a personal risk factor, two identified smoking as a risk factor, and four each identified diabetes and high cholesterol level to be personal risk factors. The researchers also found that while 18% of the sample identified hypertension as a personal risk factor, 33% thought that hypertension no longer posed a risk factor for them because they were on medication that stabilized their blood pressure levels. They also found that most of the women in this sample did not know that high-density lipoprotein potentially lowers CHD risk; that exercise enhances the functioning of the heart; and that overexertion is indicated by fatigue following exercise. The authors found no significant relationships between perceived risk and risk-reducing behaviors and none between knowledge of perceived risk for CHD and risk-reducing behavior. The researchers suggest that women in the sample were limited in knowledge about their perceived risk of CHD and were not as engaging in preventive behaviors to thwart the chances of CHD or CHD progression. They also discuss that these participants perceived their risk to be much lower than those documented in their medical records. The authors include their small sample size as a limitation in the study in addition to the convenience sample, and the predominantly white, middle-class, suburban status of the participants in this study (Oliver-McNeil & Artinian, 2002). Nonetheless, the results suggest that women do not perceive their risk of CHD to be as great as what it actually is and that knowledge about CHD may be low.

**CHD Knowledge**

Many women do not know that CHD is the leading cause of death in women in the United States (AHA, 2007) nor are aware of specific risk factors for CHD (Mosca, Ferris, Fabunmi, & Robertson, 2004). Researchers have found that women are not actively and regularly engaged in activities or behaviors to reduce their risk factors and promote their overall health, which may be due to their limited knowledge of CHD (Biswas, Calhoun, Bosworth, & Bastian, 2002).

In fact, Meischke, Sellers, Robbins, Goff, Daya, Meshack, et al. (2000) were interested in the knowledge level of the general population's individual risk of CHD. They were particularly interested in those variables that affected individual perceived risk for an acute myocardial infarction (AMI). These researchers used a national community sample of 1,294 participants in a telephone interview format and hypothesized that these individuals' perceived risk level would influence the behaviors in which they engaged to prevent an AMI. In analyzing the data with mixed linear regression models, the researchers found that women who incorrectly answered that heart disease is not the leading cause of death among women, had a significantly lower perception of their own risk for AMI. Twenty-six percent of the variance accounted for general knowledge of risk factors for AMI and personal AMI awareness for their own risk. Only 31.1% of the participants were aware that CHD is the leading cause of death in the United States for women, while 74.5% correctly identified that individuals 65 years of age and older are at an increased risk of CHD due to their age (2000).

Hamner and Wilder (2007) conducted a study to illustrate the knowledge rural women in Alabama have about their actual risk of developing cardiovascular disease and

their perceived risk of developing a cardiovascular disease. These researchers obtained a sample of 112 women ranging in ages from approximately 35 to 85 years. These researchers asked two specific questions related to 1) their likelihood of being diagnosed with CVD in their lifetime using a percentage range of 0% to 100% with 0 being not at all likely and 100 being extremely likely and 2) their own risk factors for CVD. An abbreviated version of The CHD Knowledge Test (Smith, 1991) used by Oliver-McNeil and Arinian (2002) was used to test individual knowledge of CHD. The actual CVD risk factors were assessed with the Framingham CHD prediction points (D'Agostino, Grundy, Sullivan, & Wilson, 2001), such as age, gender, cholesterol level, smoking status, diabetes, and blood pressure. Nearly 60% of the participants placed their chances of developing CVD between 41% and 60%. Using independent t-tests to look at relationships among demographic factors, CHD knowledge, and CVD risk, those who had health insurance had a significantly higher awareness of CHD knowledge than those without health insurance. Using correlational analyses, results indicate that as perceived risk scores increased, age increased and that those who were employed full-time and those with a low income correlated with increased perceived risk of CVD. The researchers explain that three risk factors were identified by most participants and most of the participants identified smoking and obesity correctly as risk factors. Those individuals at increased risk of CVD were those who were without health insurance, those on Medicare or Medicaid, those with low incomes, and those who were single. These authors also note the small sample size and potential difficulties in understanding directions as limitations of the study (2007). This study adds to the literature on women's perceptions of CVD in terms of both perceived and actual risk. It also presents the need

for researchers to examine more thoroughly the variables factoring into CHD knowledge and perceived risk.

Moreover, Thanavaro, Moore, Anthony, Narsavage, & Delicath (2006) conducted a study to assess a sample of women's knowledge about CHD. The women in this study were between the ages of 35 and 60 and did not have a history of heart disease. The researchers also sought to examine the factors that predict low knowledge levels of CHD in women without CHD. Using demographic variables, self-reported risks of CHD, and the abbreviated version of the CHD Knowledge Test (Smith, 1991) as used in a study by Oliver-McNeil and Artinian (2002), a correlational cross-sectional design revealed that in this 145 participant sample women have poor knowledge about CHD, specifically with regards to diet, stress, and exercise among many women in this sample. Predictors of low CHD knowledge were found in this sample to be associated with lower education level, as well as whether participants had hyperlipidemia, normal serum lipids, a high body-mass-index (BMI), and access to a nurse practitioner. The researchers also found that no association was found among smoking history, diabetes, and hypertension with regards to CHD knowledge. The researchers suggested that just because a woman has particular risk factors for CHD does not mean that she is aware that they are actual risk factors. The authors also did not find family history to be predictive of CHD knowledge among the women in this sample, suggesting the need for education to be targeted particularly among families that are more disconnected. The authors of this study support the need for more studies to be conducted and more interventions implemented to promote positive health choices in order to reduce risk of CHD and increase awareness (Thanavaro, et al., 2006).

**The Health Belief Model**

A woman's perceptions on her vulnerability and susceptibility to a particular disease can influence whether she takes precautionary steps in protecting herself from health-related diseases. Perceived risk (i.e., perceived susceptibility) is a causal association in how one manages her health, especially in protecting her health (Aiken, Gerend, & Jackson, 2001). Perceived risk draws from the Health Belief Model (HBM; Rosenstock, 1966). Social psychologists originally developed the HBM in the 1950's as a theoretical frame to examine behaviors and beliefs people have about preventative care (Hochbaum, 1956). At the time, individuals were not utilizing the screenings available for tuberculosis and were not seeking the vaccinations available for polio. As a result, these social psychologists sought a model to explain the conditions under which an individual will seek care to prevent a disease (1956; Rosenstock, 1959). The HBM focuses on 1) Explaining and predicting the likelihood of preventive health behavior; 2) Considering the associations between health behaviors and the use of health services; and 3) Understanding and recognizing health motivation as a way to differentiate health behavior from disease (Rosenstock, 1966). According to the HBM, a person is likely to adopt a recommended behavior if 1) She perceives herself as susceptible to getting the disease; 2) She perceives the outcomes of having the disease or condition as serious; and 3) She perceives the benefits of adopting the recommended behavior to outweigh any barriers (Rosenstock, 1974).

Furthermore, Strecher and Rosenstock (1997) identify six concepts that comprise the HBM. These components include 1) Perceived susceptibility (i.e., an individual's opinion about her risk or chance of getting a disease or condition); 2) Perceived severity

(i.e., an individual's opinion about the seriousness and consequences of getting a disease or condition); 3) Perceived benefits (i.e., an individual's belief that taking action will be effective in reducing either risk of getting the disease or the consequences of having a disease or condition); 4) Perceived barriers (i.e., an individual's judgment about the physical and psychological obstacles to taking action; 5) Cues to action (i.e., Triggers that signal the need to take action, such as visual reminders); and 6) Self-efficacy (i.e., an individual's belief that she can take action to reduce the risk or impact of a disease or condition).

In fact, Bandura (1977) explored the concept of self-efficacy as it relates to expectations about one's effectiveness in conducting a behavior and distinguished it from the concept of expectations about an outcome. Rosenstock, Strecher, and Becker (1988) extended the HBM to include self-efficacy as a way to increase the power of the HBM to explain health behaviors. These authors included self-efficacy in the model in response to literature that significantly supported its involvement in the modifications of behavioral changes and the adherence to them (Bandura, 1986; Marlatt & Gordon, 1985; Strecher, DeVellis, Becker, & Rosenstock, 1986).

Researchers utilized this newer version of the HBM throughout the 1980s as a means to explain and predict patient acceptance of medical providers' health care recommendations, as well as to use as an intervention tool to reduce unhealthy behaviors, such as cigarette smoking (Strecher and Rosenstock, 1997). Janz and Becker (1984) examined studies between 1974 and 1984 that investigated the utilization of the HBM in health prevention screenings and assessments (e.g., receipt of vaccinations, attention to diet and exercise). These authors published their findings in a comprehensive literature

review. From their findings, perceived barriers predicted most powerfully preventive health behaviors across the literature they examined. Janz and Becker (1984) also found that perceived risk strongly predicted one's likelihood to adopt and take preventive health behaviors. In the studies they examined that measured steps taken for reducing risk, the authors found that perceived cardiovascular risk was only a predictor of taking behavioral risk-reduction steps in half of the studies (1984).

In fact, patients who suffered heart attacks were in disbelief that the symptoms were actual heart attack symptoms because they perceived their personal risk for having a heart attack as very low (Finnegan, Meischke, Zapka, Leviton, Meshack, Benjamin-Garner, et al., 2000). The belief that symptoms are associated with cardiac issues has a strong relationship to the immediate utilization of healthcare services than the belief that symptoms are not associated with cardiovascular concerns (Meischke, Eisenberg, Schaeffer, Damon, Larsen, & Henwood, 1995). Those individuals who perceive their risk for cardiovascular-related diseases to be higher may be more inclined to act in health-protective ways than those who do not perceive risk to be a problem (Kreuter & Strecher, 1995). Taking health-protective measures likely will lead to behaviors that promote positive health behaviors (e.g., exercising, eating healthy foods). Factors that have been associated with perceived risk of disease include 1) Awareness of risk factors (Avis, Smith, & McKinlay, 1989; Becker & Levine, 1987); 2) General health (Avis, Smith, & McKinlay, 1989); 3) Knowledge of disease risk (Legato, Padus, & Slaughter 1997; Pilote & Htlaky, 1995); and 4) Awareness of heart attack occurrence in one's social environment (1997; 1995).

In the HBM, perceived risk refers to the beliefs an individual has about the probability or likelihood that a negative health outcome will occur (Rosenstock, 1966, 1974). The HBM also addresses the triggers that frequently cue an individual to take action, such as having a heart attack (1966). Therefore, one's perceived vulnerability to developing heart disease, for example, is important in taking preventive behaviors to reduce the likelihood that a cue or trigger will occur.

**Health Promotion Model**

An expansion of the HBM is the Health Promotion Model (HPM; Pender, 1975). This model explains disease promotion in addition to disease-prevention behaviors and does not include perceived threat or fears as a means for motivating behavioral changes. Instead, this model focuses on health enhancement through the use of cognitive-perceptual variables and modifiable factors that lead to behaviors that promote health and well-being. It is a model of individual interaction with the environment in modifying behaviors to enhance overall health (1975).

In fact, the primary assumptions of the HPM include 1) Individuals desire to promote lives that enhance their uniqueness; 2) Individuals can engage in reflection and awareness of their own strengths and abilities; 3) Individuals desire to grow toward positive directions that promote change and steadiness; 4) Individuals desire for self-regulation in their behaviors; 5) Individuals both engage in changing environmental factors and in progressively changing their own behaviors; 6) Individuals interact with health professionals who are influential in their lives; and 7) Interactions between an individual and the environment are important in an individual's behavior modification

and require an individual to initiate his or her own change between these two interactions (Pender, 1996).

Additionally, the HPM also includes the role of other people in an individual's health promotion (Pender, 1996). That is, other people can model a positive behavioral lifestyle change and support the individual in making that transformation. These supports can include family members, friends, peers, health care workers, and others. These individuals can either encourage commitment to positive health behavioral changes or discourage them. Health promotional behaviors are inclined to be maintained if individuals have a high commitment to them but less inclined in there are other responsibilities that are more immediately in need of attention. Incentives are also important in this model in assisting with the modification of thoughts, mood, physical activity, and interpersonal characteristics. In this model, the following attributes contribute to an individual's likelihood to be committed to lifestyle changes and to engage in health-promoting behaviors: 1) Personal characteristics (i.e., cultural, biological, and psychological); 2) Experiences one has had prior to health-promoting behaviors; 3) Perceptions of benefits of taking action; 4) Perceptions of barriers to taking action; 5) Perceptions of self-efficacy; 6) Affect about physical activities; 7) Interpersonal influences and supports; 8) Environmental influences; and 9) Other demands in need of immediate action (Pender, Murdaugh, & Parsons, 2002).

**Women and Depression**

Differences in gender have been found in subsyndromal and major depression. Over the past few decades, gender differences have been reported in terms of depression rates, specifically that regardless of culture, women are two times more prone to

experiencing depression than men (Bebbington, 1998; see also Nolen-Hoeksema, 1987, 1990; Sprock & Yoder, 1997; Weissman, Bland, Joyce, Newman, Wells, & Wittchen, 1993; Weissman & Klerman, 1977). That is, women have a prevalence of major depression that is twice as high as men (Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993), with specific prevalence rates ranging from 24% for women and 15% for men in community samples (1993). This prevalence begins in early adolescence, as well (1993; Nolen-Hoeksema, 1990). Within the symptom profile of depression in men and women, authors have indicated the strong likelihood that there are both similarities and differences (Bennett, Ambrosini, Kudes, Metz, & Rabinovich, 2005; see also Angst & Dobler-Mikola, 1984; Kornstein, Schatzberg, Thase, Yonkers, Hess, Harrison, Davis, & Keller, 2000; Scheibe, Preuschhof, Cristi, & Bagby, 2003; Khan, Gardner, Prescott, & Kendler, 2002; Silverstein, 2002).

Gender differences are likely to stem from hormonal fluctuations associated with menstrual and reproductive cycles (Kornstein & Parker, 1997). Kornstein and colleagues (1996) indicated that the menstrual cycle exacerbated depressive symptoms in 50% of clinically depressed premenopausal women. Depressive symptoms are commonly reported in perimenopause, including depressed mood, insomnia, and concentration problems (Kornstein, 1996) and among women taking hormonal therapies, such as hormone replacement therapy, hormonal contraceptives, infertility medications (1997).

Kornstein, et al. conducted a study on a clinically depressed sample of individuals varying in age from 21 to 65. The authors found that women experienced more severe depression than men and particularly greater levels of psychomotor retardation than men. The authors further found that in accordance with the DSM-III-R criteria for major

depression, the number of depressive symptoms reported by men and women were not significant (Kornstein & Parker, 1997).

Further, researchers found somatic symptoms to be more frequently reported in women with depression than men with depression (Kornstein et al, 2000; see also Nolan & Wilson, 1994; Silverstein, et al, 1999). Other researchers found that atypical, somatic depressive symptomatology, including increased appetite and sleep, were more prominent in women than in men (Young et al, 1990). From a socioeconomic standpoint, women are paid less than men on average (Rosenfield, 1989) and often take on the majority of household tasks and childcare (Lennon & Rosenfield, 1992), which can lead to greater depression and financial problems (1989) and ultimately greater role demands (Rosenfield, 1992). One study examining socioeconomic status (SES) as a predictor of depression in a sample of 395 adults between the ages of 45 and 75 found through regression analyses a negative relationship between being female and depression such that low SES was associated with high levels of depression (Elliot, 2001).

In considering these differences in gender that have been found in the literature, it leaves one to wonder about the pathways to depression in men and women and whether they are different. Some researchers suggest that there are physiological differences in depression between men and women, while others use sociological models or cognitive diathesis-stress models.

In fact, in a study examining gender differences in the symptom profile of major depression in a sample of 399 female and 199 male participants, results of logistic regression, chi-squared, independent t-test, and Mann-Whitney statistical analyses (Cox, 1972) revealed that females reported higher levels of atypical depressive symptoms,

earlier age onset, suffered a higher number of depressive episodes, and had a higher number of depressive symptoms (Smith, Kyle, Forty, Cooper, Walters, Russell, et al., 2008). In this study, atypical depression was defined as meeting "two of the three symptoms of excessive physical fatigue, overeating and over-sleeping as present during a major depressive episode" (p. 282). With atypical depression, men reported nearly a 10% lower prevalence of atypical depression than women. The authors suggest that this difference in gender could mean that there are pathophysiological differences between males and females with depression (2008). Of course, a limitation of this study is that there was nearly half the number of male participants in this study than females; nonetheless, the findings add to the literature supporting that there are differences in gender on depression and that this difference may involve physiological factors.

Other researchers explain these gender differences through sociological models and theories. One of these attempts includes the response bias explanation, which refers to the linkage of gender role socialization to the higher prevalence of depression in women (Sigmon, Rohan, Dorhofer, Hotovy, Trask, & Bourland, 1997). In a sample of 223 male and 399 female participants between 18 and 53 years of age administered the Beck Depression Inventory—II (BDI-II; Beck, Steer, & Brown, 1996), the social desirability subscale of the Mental Health Inventory (MHI; Veit & Ware, 1983, the Mental Health Attitudes Scale (MHAS; Sigmon, Kendrew, Whitcomb-Smith, Bourland, Edenfield, & Kubik, 2003), and the Personal Attributes Questionnaire (PAQ; Spence, Helmreich, & Stapp, 1974), participants were randomly assigned to one of eight experimental groups based upon four levels of follow-up (i.e., no further contact, referral given, contact if significant level of depression exists, and contact participant and

spouse/significant other if responses suggest participants may harm himself/herself) and two causes of depression (i.e., biological or psychological) (Sigmon, Pells, Bourland, Whitcom-Smith, Edenfield, Hermann, LaMattina, et al., 2005). Results of this between-subjects design revealed that men responded differently depending upon the level; that is, men reported a more depressed mood in the no further contact group and decreased reports of depressed mood in the two contact groups. As a result, men responded more stereotypically with more intrusiveness in terms of contact in their lives. However, women's reports of depressed mood remained consistent despite the different levels. The authors concluded that these results could reveal that both men and women report depressive symptoms based upon how they believe that men and women would typically respond—a response bias based upon stereotypes. These authors further explained that the male participants in their study may have considered that they would not be contacted further, so they were more inclined to report their true feelings than the way they stereotypically think males would respond about feelings (2005). Stereotypes regarding gender and feelings may be explained by the function of stereotypes as a cognitive schema, leading males and females to consider emotional situations differently, especially in places where there is limited context with which to base stereotypical responses (Barrett, Robin, Pietromonaco, & Eyssell, 1998; Fischer, 1993; Fiske & Taylor, 1991; Madden, Barrett, & Pietromonaco, 2000; Shields, 1987, 1991).

These researchers further found that men attributed depression to psychological factors more frequently than women, who attributed depression to a combination of psychological and biological variables. They also found that men more frequently avoid or distract themselves in responses to depressed feelings, while women not only notice

depressive symptoms, but also are concerned about the causes and consequences of them (Sigmon et al., 2005). The results of this study were consistent with the results of a study by Nolen-Hoeksema (1987) who found that men were less attuned to their depressive symptoms than women.

Other models have examined the involvement of cognitive variable differences (i.e., attitude toward situations and how one characterizes the situation) in pathways to depression between males and females, particularly implying that these cognitive factors are more highly related to depression in females than depression in males (Abramson & Andrews, 1982; Nolen-Hoeksema, 1990, Teasdale, 1988). There has been research linking the cognitive factors, dysfunctional attitude and attributional style, and depression (Haaga, Dyck, & Ernst, 1991; see also Sweeney, Anderson, & Bailey, 1986). A cognitive diathesis-stress model of depression has been developed that aids in the exploration of gender differences in the importance of cognitive diathesis-stress variables to depression (Abramson, Metalsky, & Alloy, 1989; Beck, 1987). Specifically, this model suggests that the interaction of interpersonal or achievement cognitive domains (i.e., dysfunctional attitudes) and a domain-matching negative stressor or diathesis (i.e., attributional factor) result in depression (1989; 1987). In a study examining the hypothesis that cognitive pathways are the way in which females more likely arrive at depression, the prediction was made that females who are depressed show a larger frequency of domain matches between cognitive diatheses and negative stressors (Spangler, Simons, Monroe, & Thase, 1996). Using a sample of 59 outpatients seeking treatment at the Mood Disorders Module of the Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, the following measures were used to assess

cognitive diatheses and negative stresses prior to the initiation of treatment: (1) Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978); (2) the Atrributional Style Questionnaire (ASQ; Rose, Abramson, Hodulik, Halberstadt, & Leff, 1994); the Psychiatric Epidemiology Research Interview Life Events Scale (Dohrenwend, Krasnoff, Askenasy, & Dohrenwend, 1978); and the Life Events and Difficulties Schedule (LEDS; Brown & Harris, 1978). The latter two scales were specifically used to assess negative stressors in terms of severity, domain, and occurrence. Statistical analyses used in this study included the grouping of participants based upon the diathesis-stress domain match they exhibited. The results of this study showed that the cognitive diathesis-stress pathway arrived at depression with females more frequently than with males and that both dysfunctional attitudes and a pre-onset negative stressor were found significantly more among depressed females than depressed males, suggesting that a cognitive-diathesis stress match may lead to depression more so in females than in males, as more depressed females exhibited a match than depressed males. Other results of this study indicated that prior to a depressive episode onset, depressed females more frequently experienced a severe negative life event than depressed men, specifically that they had more troubling life events one year prior to onset than depressed men (Spangler, et al., 1996).

With older adults, the literature on gender differences and depression is sparse and the literature that does exist is inconclusive. For example, some researchers report that gender differences are possible (Fopma-Loy, 1988), while other researchers demonstrate no differences in depressive symptoms between older men and women (Oltman, Michals, & Steer, 1980).

Kockler and Heun (2002) examined the differences between men and women in the number of depressive symptoms, the types of depressive symptoms endorsed, and the subtypes of depression presented in middle-aged and older men and women. The sample in this study consisted of 236 participants 50 years of age and older with a historical diagnosis of major depression and 357 control subjects matched for age, gender, and educational status. Participants were interviewed utilizing the Composite International Diagnostic Interview (CIDI; Robins Wing, & Helzer, 1987, as cited in Kockler & Huen, 2002), which consisted of the Mini Mental State Examination (MMSE, Folstein et al., 1975) and specific questions about the duration of depressive and other psychiatric symptomatology. Student *t*-tests were used to determine the number of depressive symptoms reported in the population and in those participants with a lifetime prevalence of major depressive disorder. Stepwise multiple regression analyses were utilized to evaluate the effect that gender had upon the number of depressive symptoms, with potential confounding factors (e.g., age, cognitive performance as assessed by the MMSE, marital status, parenthood status, employment status, and professional training status) being controlled. The frequencies of symptoms in the general population and in participants with a lifetime major depressive disorder were assessed in terms of gender using chi-square tests. Confounding factors were accounted for by using stepwise forward logistic regression analyses. The covariates (i.e., age, MMSE, marital status, parenthood status, and employment status) were controlled by demonstrating the influence of gender on every symptom of depression (Kockler & Heun, 2002).

The results of this study indicated that depressive symptoms in middle-aged and older women were significantly greater than those in middle-aged and older men

(Kockler & Heun, 2002). A lifetime prevalence of major depression did not vary significantly between these males and females in terms of the number of reported symptoms. Further, these researchers found that the female participants in general portrayed a decrease in appetite, as well as appetite disturbance and joylessness, more frequently than the men; however, according to logistic regression analyses, these differences may be accounted for by familial status (i.e., marital status and age) more than depressive symptomatology (2002). Nonetheless, specifically with depressed women in this study, results indicated greater reductions in appetite than in depressed men. Depressed men reported more agitation than depressed women (2002).

The authors of this study concluded that appetite disruptions and agitation together explained the gender differences in major depressive symptoms in the middle-aged and older adults used in this study (Kockler & Heun, 2002). The authors further concluded that appetite disturbances and agitation alone do not account for the prevalence of the atypical subtype of depression in the participants of this sample. However, they indicated that the *perception or expression* of depressive syndromes may account for this prevalence, either by psychological factors (i.e., sex roles, gender-specific coping styles) or through biological considerations (2002). The importance of this study to future research concerns the noted differences in depressive symptoms found between men and women, particularly in men and women 50 years of age and older. This added information is pertinent to the need to specifically examine such differences among adults 65 years and older, as there are likely significant factors going on in middle-aged adults (e.g., menopause in women, empty-nest syndrome) that may not be relevant contributors to depression in older adults, particularly women.

In considering research with gender and age, researchers attempted to clarify the weight of gender on depression across the life span but have not been able to differentiate between age effects and cohort effects. One study with middle and older adults attempted to shorten this gap by utilizing longitudinal and cross-sectional comparisons to examine both gender and age as predictors of depressive symptoms in men and women over a 30-year period (Barefoot, Mortensen, Helms, Avlund, & Schroll, 2001). This study also took into account somatic and nonsomatic symptoms, as some researchers raised concerns that some depression measures reflect health status in older adults more so than actual depressive symptoms (Kessler, Foster, Webster, & House, 1992; Newman, 1989).

This study examined gender, age, and depressive symptoms at three different time points over the 30-year period—50, 60, and 80 years-old (Barefoot et al., 2001). The first testing point in 1964 consisted of 384 men and 289 women who were administered the Obvious Depression Scale (OBD; Weiner, 1948), which is an instrument derived from the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1943). The second testing point in 1974 occurred when the participants were 60 years old; participants were again evaluated with the OBD. In 1984, the participants were examined without utilization of the OBD; that is, they were asked questions about mental health. In 1995, 181 participants completed the OBD instrument. At this point, 83 men and 68 women of the original sample were able to complete all three testing administrations at 50, 60, and 80 years-old (2001).

In the cross-sectional comparison, depression scores for women were significantly higher than men at age 50, less significant at age 60 and not significant at age 80

(Barefoot et al., 2001). In longitudinal comparison, the Age x Gender interaction was found to be significant for men, with men showing a strong elevation across time and women demonstrating no significant interaction across time. With regards to somatic and nonsomatic symptoms, the Age x Gender interaction was significant in the nonsomatic symptoms but not with the somatic symptoms, with men and women reporting greater somatic symptoms between 60 and 80 years of age (2001).

Interestingly, both the longitudinal and cross-sectional comparisons found that the gap in depressive symptoms reported between the two genders decreased as the participants aged (Barefoot et al, 2001). Women's depressive symptom reports stayed consistent across the 30-year follow-up, while men's depressive symptoms increased significantly after 60 years of age until leveling off at the point reported by women. The authors further reported that this trend in the male sample was not due to somatic problems because the significant interaction between gender and age was present only with the nonsomatic items. The authors also reported that the functional ability of men at age 80 was likely not an explanation for the interaction because the men in this sample retained their abilities to function on a daily basis (2001).

The implications in this study are important in considering depressive symptoms in older adults across various age groups, particularly between the genders, in that women may tend to have a chronic and stable report of depressive symptoms throughout their middle and older adulthood while men may show a less consistent report that levels off as they age. For the purposes of future research, this research supports the need for further investigation of the relationship of somatic complaints to depression and depressive symptoms, as this study did not tease apart these two essential factors. It also

supports the need for functional ability to also be factored into studies on depression and older adults.

Another study examined the psychosocial and medical issues associated with depression, as well as gender differences in depression in a Swedish sample of 363 adults 85 and older (Bergdahl, Allard, Alex, Lundman, & Gustafson, 2007). The following instruments were utilized: 1.) Geriatric Depression Scale -15 (GDS-15; Sheik & Yesavage, 1986) to assess for depressive symptoms; 2). Montgomery-Asberg Depression Rating Scale (MADRS; Montgomery & Asberg, 1979) to assess for depression; 3.) Organic Brain Syndrome Scale (OBS; Jensen, Dehlin, & Gustafson, 1993) to assess for other psychiatric symptoms in addition to depressive symptoms; 4.) Mini-Mental State Examination (MMSE; Fostein, et al., 1975) to assess cognitive functioning; 5.) Assessment of security and loneliness through a series of questions concerning safety at home, access to social and family support, and need for more family and social support and connection; 6.) Barthel Activities for Daily Living Index (Mahoney & Barthel, 1965) to assess physical independence; and 7.) Philadelphia Geriatric Center Morale Scale (PGCMS; Lawton, 1975) to assess quality of life among older adults. Statistical analyses included chi-squared tests, as well as Student's t-tests and logistic regression models. Researchers found significant relationships between depression and loneliness, not going outside the home independently, and few social visitations with others on a weekly basis. Findings indicated that men had significant associations between depression and lack of social support and lack of social network; findings with men also showed that losing an adult child within the previous ten years was significantly associated with depression, as well as a history of falls, impairments in reading vision, and incontinence in comparison

to men without depression. Findings further indicated that women had significant associations between depression and living conditions, lack of family visits, loneliness, not going outside independently, as well as dementia, constipation, heart failure, and having to take numerous medications. Findings with women also demonstrated that depressed women scored significantly lower on the Barthel ADL Index and the MMSE. The authors of this study concludee that depression is a factor that must be considered in the treatment of the very old despite the potential difficulties (e.g., distinguishing depressive symptoms from cognitive decline) in treating depression in older adults (Bergdahl, Allard, Alex, Lundman, & Gustafson, 2007).

**Women, CHD, and Depression**

In a review of the literature on depression and depressive disorders and CHD, Frasure-Smith and Lesperance (2005) found evidence supporting the association between depression and CHD both in etiology and prognosis. That is, this literature review found substantial support that in this relationship, depression both increases the chance of developing CHD and increases the chance of worsening CHD symptoms and risk factors (2005). A cohort study by Rugulies (2002) found that in the 11 studies evaluated for depression and CHD, individuals with symptoms of depression but no formal diagnosis were 1.5 times more likely than the population to have another cardiac occurrence; those diagnosed with depressive disorders (e.g., major depression, dysthymia) were 2.5 times more likely than the population to be at risk for a myocardial infarction or even coronary death (2002).

Specifically with women, researchers have conducted limited studies focusing specifically on prognosis *after* a myocardial infarction has occurred or exclusively on the

risk factors for CHD progression in women *after* a myocardial infarction has occurred (Bankier & Littman, 2001). In the research that has been conducted, researchers showed that women have a poorer prognosis post-MI than men and typically suffer more from hypertension, congestive heart failure, and diabetes (Carney, Freedland, Smith, et al., 1991, as cited in Polk & Tasneem, 2005; see also Dittrich, Gilpin, Nicod, et al., 1988; Greenland, Reicher-Reiss, Goldbourt, & Behar, 1991), even when these variables are adjusted for baseline distinctions (Vaccarino, Parsons, Every, et al., 1999, as cited in Polk & Tasneem, 2005).

Further, other researchers found that women who have had a heart attack report more psychological and psychosomatic complaints than men, even when controlling for age and comorbidity discrepancies (Wiklund, Herlitz, Johansson, et al., 1993, as cited in Polk & Tasneem, 2005). Women tend to 1) Have more severe depressive symptoms that last longer; 2) Have more diagnosed depressive disorders than men (Drory, Kravetz, & Hirschberger, 2003; Stern, Pascale, & Ackerman, 1977, as cited in Polk & Tasneem, 2005); and 3) Be at a greater risk than men of developing major depression (Kendler, Thorton, & Prescott, 2001; Wassertheil-Smmolller, Berge, Chang, et al, 1996). Coupled with pre-existing heart problems, this could lead to reinfarction, other heart conditions, and/or even death.

In fact, in a cohort study comparing 677 men and women hospitalized for a myocardial infarction between October 1, 1990 and September 30, 1992, the researchers of this study assessed participants for treatment (e.g., cardiac medications prescribed, number of physician visits, revascularization, and diagnostic testing), physical health status (i.e., as assessed by the physical component summary from the Medical Outcomes

Study Short Form 36), reinfarction, and mortality during the year following the myocardial infarction (Schwartz, Fischer, Tosteson, Woloshin, Chang, Virnig, et al., 1997). At the one year follow-up, researchers found low reinfarction and mortality rates for both men and women; however, women demonstrated a more immediate decrease in physical health than men (1997), which leads to the assumption that reinfarction or additional heart problems may occur in the future (i.e., more than one year after the myocardial infarction).

Additionally, researchers Mieszczanska, Pietrasik, McNitt, Moss, and Zareba (2008) examined gender differences in electrocardiographic (ECG) factors after the first myofcardial infarction (MI) in female (N=216) and male (N=622) patients in the Thrombogenica Factors and Recurrent Coronary Events (THROMBO) study (i.e., post-MI patients at least 21 years of age and older enrolled in one of 13 participating hospitals, agreeing to participate, and surviving two years after enrollment between October 1994 and June 1997). These researchers found that females showed a 38% higher risk of recurrent cardiac events than males at the two-year follow-up (Mieszczanska, Pietrasik, McNitt, Moss, & Zareba, 2008). Specifically, using multivariate Cox regression analysis (Cox, 1972) to assess ECG ratings five to seven days following the initial MI, women, unlike men, showed an increase in risk for a recurrent cardiac event (2008). However, the reasons why this increased risk found in this study and previous studies discussed in this review remains to be speculated. As a result, this study supports the need for research to be conducted on risk factors associated with CHD progression, specifically in women.

In a study examining gender difference in particular depressive symptoms related to health-related quality of life (HRQL) post myocardial infarction in a sample of 486 patients admitted to emergency room hospitals in Quebec, Canada within three days of admission, participants completed the Short-Form 36 (SF-36; i.e., self-report that measures health-related quality of life or patient's perceived health status) and the Beck Depression Inventory (BDI) during admission (i.e., baseline) and at the one year follow-up (Norris, Hegadoren, & Pilote, 2007). Using multivariate statistical analyses, results of this study found that women had significantly poorer scores on the BDI (i.e., women = 14.3% and men = 11.7% increase in depressive symptoms) and HRQL at follow-up than men, as well as a larger decrease in quality of life. The authors concluded that women appear to have more negative psychological responses after a heart attack, which may affect recovery (2007). This study supports that women may be at increased risk for future myocardial infarctions.

**Depression Measure**

**Beck Depression Inventory – II (BDI-II)**. The Beck Depression Inventory – Second Edition (BDI-II; Beck, Steer, & Brown, 1996) is a self-report instrument designed to assess the degree and existence of depressive symptoms. Items address sleep, weight loss, appetite, and other items consist with the *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition* (DSM-IV; American Psychiatric Association, 1994). Respondents rate answer responses from zero to three. Total scores result from summing all scores. Mild depression is indicative of scores from 14 to 19, moderate depression is indicative of scores from 20 to 28, and severe depression is indicative of scores 29 to 63. The reliability of the BDI-II is high, with coefficient alphas

of .92 for outpatients and .93 for college students. Test-retest reliability is significantly high with a correlation of .93. The validity of the BDI-II is also high with a correlation of .93, including high concurrent, content, and discriminant validities (Beck, et al., 1996). The BDI-II is normed for adolescents 13 years-old and older and adults, including older adults up to 86 years-old (1996); both geriatric inpatients and the geriatric outpatient populations are normed (Steer, Rissmiller, & Beck, 2000). This instrument is also appropriate across various cultural and ethnic groups (Beck, et al., 1996).

**Perceived Risk of Heart Disease Measure**

**Perception of Risk of Heart Disease Scale (PRHDS)**. The Perception of Risk of Heart Disease Scale (PRHDS; Ammouri & Neuberger, 2008) is a measurement that assesses an individual's perception on the likelihood that he or she will get heart disease. It is divided into three dimensions 1) Dread risk; 2) Risk; and 3) Unknown risk. These dimensions place individuals on a range from low to high perceptions of risk of CHD. Cronbach's alpha internal consistency reliability coefficients for each the three scales included .80 for dread risk, .72 for risk, and .68 for unknown risk. The test-retest correlation coefficients for these dimensions include .76 for dread risk, .70 for risk, and .61 for unknown risk. Overall reliability was .80. Through hypothesis testing, the authors found positive correlation coefficients with the Health-Promoting Lifestyle Profile II (HLP II; Pender, 1996) ranging from .20 to .39 for construct validity.

**CHD Knowledge Measure**

**CHD Knowledge Test for Women. CHD Knowledge Tool for Women**. The Coronary Heart Disease Knowledge Tool for Women (Thanavaro & Delicath, 2008) was developed from the original CHD Knowledge Test (Smith, Hicks, & Heyward, 1991)

designed to measure individual knowledge of CHD in men. The purpose of this tool is to measure knowledge of CHD in women. It contains 25 items about women's knowledge of health behaviors to prevent CHD and promote a healthy lifestyle. Oliver-McNeil and Artinian (2002) developed a modified version of the original CHD Knowledge Test to use with women, but feedback from participants indicated that some of the language was difficult to understand (e.g., atherosclerosis or angina pectoris) and also lacked updated knowledge about CHD (e.g., hormone replacement therapy; Mosca et al., 2004). In the pilot study, Cronbach's alpha coefficient was found to be .79. In the study that followed the pilot study, Cronbach's alpha coefficient was found to be .74, showing similar schools, suggesting high convergent validity. The test-retest reliability coefficient was found to be .70 after a one to two week period, suggesting high stability of the construct over time. The range of inter-item correlation matrix was between -.20 to .57, suggesting that there are no redundant questions on the instrument. The original Coronary Heart Disease Knowledge Test (Smith, Hicks, & Heyward, 1991) is an instrument designed to measure men's knowledge of CHD and the risk factors associated with CHD. The construct validity ($p < .01$) and internal consistency reliability of this instrument are .84, indicating that this instrument is a valid and reliable tool for examining the CHD knowledge men possess, as well as the risk factors related to CHD (1991).

**Health Preventive Behaviors Measure**

**Health-Promoting Lifestyle Profile – II (HPLP)**. The Health-Promoting Lifestyle Profile (HPLP; Walker, Sechrist, & Pender, 1996) is a measurement that assesses an individual's tendency to engage in behaviors that promote health and well-being and decrease illness. This instrument consists of 52 items utilizing a four-point

scale (i.e., never, sometimes, often, and routinely). This instrument has a .94 alpha coefficient for the total score. This instrument contains six subscales, including 1) Health responsibility; 2) Physical activity; 3) Nutrition; 4) Spiritual growth; 5) Interpersonal relations; and 6) Stress management. The range of alpha coefficients for these subscales include from .79 to .87. The test-retest reliability coefficient was .89 for the total score. Internal consistency was found to be .92. This instrument correlated .68 with the Personality Lifestyle Questionnaire, supporting construct validity.

**Cognitive Measure**

**Mini-Mental Status Examination (MMSE)**. The MMSE is a cognitive screening instrument assessing clinical change in hospitalized older adults, including orientation to time and place, recall, short-term memory, and arithmetic ability (Folstein, 1998, 1975). The MMSE is an 11-item instrument that includes a summation of points given for each correct answer with a maximum score of 30. The cutoff score for potential cognitive challenges that may need to further consideration is 23-24. The internal consistency for the MMSE is alpha coefficient .96, according to Foreman (1987). Test-retest reliability has been found .89 and higher and inter-rater reliability .82 and higher, according to Folstein's review of his own studies (Folstein, 1983). Tierney, Herrmann, Geslani, and Szalai (2003) found correlations of the MMSE and neuropsychological tests to be between .50 and .60. With predictive validity, Murden, McRae, Kaner, and Bucknam (1991) found 93% sensitivity and 100% specificity in the high education group at the 23-24 cutoff point, 98% sensitivity and 75% specificity in the low education group. Overall, validity and reliability appear to be as good as other instruments designed to assess cognitive impairment (Folstein, 1975).

**Applicability to the field of Counseling Psychology**

According to Hill, Thorn, and Packard (2000), the roles of the counseling psychologist in working with older adults include three themes drawn from the work of Gelso and Fretz (1990). These professional roles include 1) Remedial role (i.e., helping older individuals with impairments in their functioning to resolve their problems); 2) Preventive role (i.e., considering potential problems and intervening to reduce the likelihood of their occurrence in the future; and 3) Educative and developmental role (i.e., assisting older adults with the building of skills to overcome maladaptive performance in everyday life). These roles are not mutually exclusive and tie into both physical and mental health, as well as other psychosocial concerns (i.e., lack of social supports). Considering that psychologists provide therapeutic and assessment services to women in a variety of settings, they have a pivotal role in educating women about the risk factors for the development and progression of CHD, particularly the psychosocial factors, such as depression, stress, and the various maladaptive coping mechanisms many women use to handle their stress (e.g., smoking, overeating, physical inactivity, and others). Psychologists could play a significant part in motivating women to engage in preventive health behaviors through individual and group therapy, as well as educational seminars and other public health-promoting activities, which will likely enhance positive health behaviors. Women seeking psychotherapy for depression also need to be educated on the association of depression to the development and progression of CHD.

In fact, it is well-known that the field of Counseling Psychology not only supports but also fights for reductions in gender disparities, age disparities, health disparities, minority rights, and other social justices and evidence-based practices for

working with all individuals. As a result, the aims of the role of a Counseling Psychologist in the current cardiac psychology field are to move toward bridging the gaps in CHD awareness, knowledge, and risk in women with heart disease. The field can begin to bridge this gap by considering the associations of heart disease risk perceptions and depression in older adults. The future aim is for Counseling Psychologists to implement specific, evidence-based prevention and intervention research with individuals underrepresented in the literature, particularly older women. Another aim for Counseling Psychologists is to implement such evidence-based literature to rural areas and areas with high incidences of heart disease and depression.

**Anticipated Results and Summary of Research Findings**

Because depression is more commonly diagnosed in women than in men (Bebbington, 1998) and because researchers have found higher self-reported rates of depression among older adults (Alexopoulos & The PROSPECT Group, 2001; see also Blazer, Hughes, & George, 1987; Blazer & Williams, 1980), I expected that most of the participants in this study would obtain high scores on the depression measure. Because women do not perceive their risk of heart disease to be great (Fiandt, Pullen, & Walker, 1999), I expected that most women in this sample would score low on perceived risk. Researchers have also found that women do not understand CHD (Oliver-McNeil & Artinian, 2002). Thus, I expected that most women would score low on their knowledge of CHD. Similarly, because individuals typically engage in behaviors to enhance their lifestyle when they perceive their risk to be significant for the development or progression of a disease (Pender, 1996; Strecher & Rosenstock, 1997), I expected that

most women in this sample would score low on the amount of health-promoting (i.e., health preventive) behaviors in which they engage.

Further, although researchers have found that higher levels of depression among older adults to be related to health promoting behaviors such as a lack of physical inactivity (Kritz-Silverstein, Barrett-Connor, & Corbeau, 2001) and a loss of interest and involvement in pleasurable activities (Benyamini & Lomranz, 2004), to date there have not been any studies that have specifically examined the relationship between depression and health preventive or health promoting behaviors among older women. Thus, no directionality for the relationship between depression and health preventive behaviors could be expected for this sample.

According to Andajani-Sutjaho, Ball, Warren, Inglish, and Crawford (2004), two contributors for individuals' engagement in health promoting behaviors to prevent CHD include physical activity and healthy diet. These researchers found both of these contributors to also lead to a healthy body-mass index (i.e., BMI). Additionally, Thanavaro, Moore, Anthony, Narsavage, and Delicath (2006) found a high BMI to be predictive of poor CHD knowledge. Despite that individuals with depression tend to exhibit symptoms including lack of energy and apathy about various aspects of life, to date there are no studies examining the relationship between depression and CHD knowledge. Thus, no directionality for the relationship between depression and CHD knowledge could be anticipated in this sample.

Although researchers have found that depression is related to poor perceptions on health, functioning, and well-being (Ormel, Kempan, Deeg, Brillman, van Sonderen, & Relyveld, 1998), there have been no studies to date that have examined the relationship

between depression and perceived risk of heart disease. As a result, no directionality for the relationship between depression and perceived risk of heart disease could be expected for this study.

Further, research on the relationship between CHD knowledge and health promoting behaviors among women is limited to two known studies, which offer conflicting findings. For example, in a sample of 33 women, Oliver-McNeil and Artinian (2002) used 20 items from the original CHD Knowledge Test (Smith, Hicks, & Heyward, 1991), which was designed to assess the CHD knowledge levels in men, and the HPLP-II (1996) to examine health behaviors in their sample. These researchers found a negative and non-significant relationship between CHD knowledge and health promoting behaviors. However, Thanavaro, Moore, Anthony, Narsavage, and Delicath (2006) conducted a study with a sample of 120 women without a CHD diagnosis to assess their CHD knowledge and to examine predictors of low CHD knowledge. These researchers found that those women with more knowledge about CHD were more inclined to engage in behaviors promoting their health. These researchers used a modified version of the CHD Knowledge Test (Oliver-McNeil & Artinian, 2002) designed to address women's cardiovascular risk factors, and they also used self-reported demographic data to assess engagement in health behaviors (e.g., BMI, smoking). As a result of these conflicting findings and the limited data available, I did not predict directionality for the association between CHD knowledge and health promoting behaviors in my study.

Additionally, Ammouri and Neuberger found that the PRHDS (Ammouri & Neuberger, 2008) and the HPLP – II (Walker & Hill-Polrecky, 1996) were positively, but not significantly correlated. Because there has been only one study to date that has

examined the relationship between perceived risk of heart disease using the PRHDS and health-promoting behaviors using the HPLP-II, I did not predict directionality in my study.

Appendix B

# SCREENING QUESTIONS

# Screening Questions

Please Circle YES or NO to the following questions:

1. Have you ever been diagnosed with clinical depression?

YES NO

2. Have you been diagnosed with clinical depression in the past?

YES NO

3. Have you ever been told by a physician that you are at high risk for heart disease?

YES NO

4. Have you ever been diagnosed with heart disease by a physician?

YES NO

Appendix C

MINI-MENTAL STATE EXAM

Mini-Mental State Exam (Folstein)

NAME_____ DOB_____ DATE_____

Now I'm going to ask you some questions to test your concentration and memory.

ORIENTATION TO TIME

( ) What year is this? (1 point)
( ) What season of the year is it? (1 point)
( ) What is the month and date? (1 point for each)
( ) What day of the week is it? (1 point)

ORIENTATION TO PLACE

( ) What is the name of this place? (1 point)
( ) What floor are we on? (1 point)
( ) What city and state are we in? (1 point for each)
( ) What county is this? (1 point)

IMMEDIATE RECALL

( ) I am going to say 3 objects. After I say them, I want you to repeat them. They are: "Apple," "Table," "Penny." Now you say them. Remember what they are because I'm going to ask you to name them again in a few minutes. (1 point for each)
(Interviewer: Repeat until all 3 are learned.)

ATTENTION (either item)

( ) a) Subtract 7 from 100, then subtract 7 from the answer you get and keep subtracting 7 until I tell you to stop. (1 point for each correct answer, maximum 5 points)
( ) b) Spell the word "world" backwards. (1 point for each letter, maximum 5 points)

DELAYED RECALL

( ) What are the 3 words I asked you to remember? (1 point for each)

NAMING

( ) Show patient wrist watch and pen and ask to name them. (1 point for each)

REPETITION

( ) Repeat the following sentence exactly as I say it. "No ifs, ands, or buts." (1 point)

3 STAGE COMMAND

( ) Now I want to see how well you can follow instructions. I'm going to give you a piece of paper. Take it in your right hand, use both hands to fold it in half, and then put it on the floor. (1 point for each command, maximum 3 points)

READING

( ) Show patient page next page and ask patient to read what is says at the top of the page silently, to him/herself, and then do what it says. (1 point)

COPYING

( ) Give patient clean sheet of paper and ask him/her to copy the design printed on the next page. (1 point)

WRITING

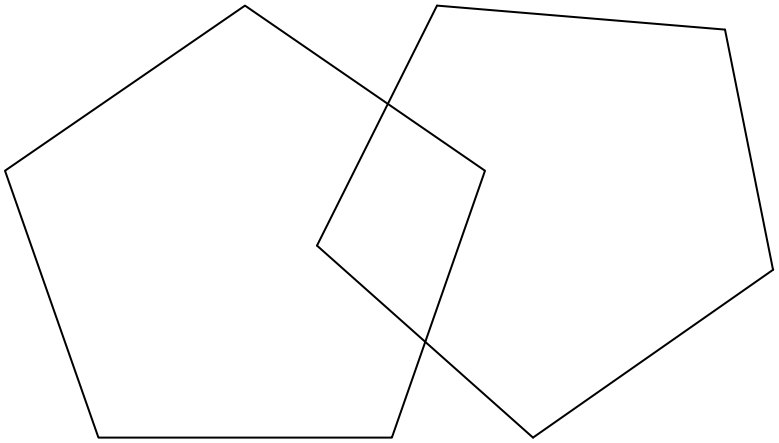
( ) On same sheet of paper, ask patient to write a complete sentence. (1 point)

_____

( ) Total (Maximum score = 30)

24-30 No Cognitive Impairment
18-23 Mild Cognitive Impairment
0-17 Severe Cognitive Impairment

# CLOSE YOUR EYES



Appendix D

DEMOGRAPHIC QUESTIONNAIRE

## Demographics Questionnaire

Please answer the following questions:

1. Age: ☐ 65-70
☐ 71-75
☐ 76-80
☐ 81-85
☐ 86-90
☐ 91-95

2. Gender: ☐ Female ☐ Male

3. Ethnicity: Are you Spanish/Hispanic/Latino/a?

a. No, not Spanish/Hispanic/Latino/a

b. Yes, Mexican, Mexican American, Chicano

c. Yes, Puerto Rican

d. Yes, Cuban

e. Yes, Other Spanish/Hispanic/Latino/a

(please write group)

_____

4. What is your race? (Please mark one or more races)

a. White
b. Black, African American, Negro
c. American Indian or Alaskan Native
(write name of tribe)
_____
d. Asian Indian
e. Chinese
f. Filipino
g. Japanese
h. Korean
i. Vietnamese
j. Native Hawaiian
k. Guamanian or Chamorro
l. Samoan
m. Other Asian (please write race)
_____
n. Other Pacific Islander (please write race)
_____
o. Some other race (please write race)
_____

5. What is your ancestry or ethnic origin? (Please write)
_____

6. How much education did you have?
a. Did not finish high school
b. Graduated from high school or attained a GED
c. Some education after high school
d. Graduated from college

e. Master's degree
f. Ph.D.
g. Professional degree

7. What is your marital status?
   a. Married
   b. Cohabitating/Living Together
   c. Divorced
   d. Separated
   e. Widowed

8. Have you been diagnosed with heart disease by a physician?

YES NO

9. If you have been diagnosed with heart disease by a physician, at what age (or approximate age) were you diagnosed? _____

10. Did/does your mother or father have heart disease?

YES NO

11. Do/did you have other family members (besides mother or father) who have heart disease?

YES NO

11 a.) If yes, who? (Examples: sister, grandfather)

_____

12. How much do you know about the facts and statistics on heart disease among women? Please check the box below for the number that best fits your knowledge.

☐ 1 No Knowledge

☐ 2 A little bit of knowledge

☐ 3 Average knowledge

☐ 4 Some knowledge

☐ 5 A lot of knowledge

13. How many times a week do you typically engage in exercise that raises your heart rate (For example, jogging, swimming, walking, vacuuming)?

a. One
b. Two
c. Three
d. Four
e. Five
f. Six
g. Seven
h. None

13a.) If you do exercise, approximately how long?

a. Less than 10 minutes
b. 11-20 minutes
c. 21-30 minutes
d. 31-40 minutes
e. 41-50 minutes
f. 51-60 minutes

g. 1 hour
h. More than one hour (please type how long)
_____

14. Do you smoke?

YES NO

14 a.) If you smoke, on average, how many days per week do you
smoke?
a. one
b. two
c. three
d. four
e. five
f. six
g. seven or daily

14 b.) If you smoke, on average, how many cigarettes do you smoke per day? Please write this number in the blank below.

Average # of cigarettes smoked per day:
_____

15. Do you use other tobacco products?

YES NO

15 a.) If yes, what other tobacco products do you use?

a. Cigars
b. Pipes
c. Snuff
d. Chewing tobacco
e. Snus
f. None
g. Other _____

16. Please check one box that best says how comfortable are you discussing heart disease concerns, symptoms, and/or problems with your physician?

☐ 1 Not comfortable at all

☐ 2 A little bit comfortable

☐ 3 Somewhat comfortable

☐ 4 Mostly comfortable

☐ 5 Very Comfortable

17. Do you take hormones (e.g., hormone replacement therapies)?

YES NO

18. Have you ever been diagnosed with Type 2 Diabetes Mellitus by a physician?

YES NO

18 a). If yes, what are your **average** blood sugar levels?

_____

19. Have you ever been diagnosed with high blood pressure (or hypertension) by a physician?

YES NO

19a). If yes, what is your average blood pressure (or current blood pressure if you do not know your average blood pressure)?

_____

20. Have you ever been diagnosed with high cholesterol (or hypercholesterolemia) by a physician?

YES NO

21. Have you ever been told by your physician that you were overweight?

YES NO

22. Have you ever been told by your physician that you were

obese?

YES NO

23. What is your current weight?

_____

24. What is your current height (in feet, e.g., 5 feet 3 inches)?

_____

25. Have you ever been diagnosed with depression?

YES NO

25 a). If yes, approximately how many weeks, months, or years ago?

_____ Weeks

_____ Months

_____ Years

26. Have you ever been diagnosed with anxiety?

YES NO

26 a.) If yes, approximately how many weeks, months, **or** years ago?

_____ Weeks

_____ Months

_____ Years

27. On average, do you feel that you talk to other people (for example, family, friends) regularly?

YES NO

27 a.) If yes, how often do you talk to them?

a. Daily
b. Weekly
c. Monthly
d. Yearly

Appendix E

PERCEIVED RISK OF HEART DISEASE SCALE

**Perception of Risk of Heart Disease Scale (PRHDS)**

| Scoring Instructions | | | |
|---|---|---|---|
| Items are scored as | Strongly disagree | = | 1 |
| | Disagree | = | 2 |
| | Agree | = | 3 |
| | Strongly Agree | = | 4 |

| | Strongly Disagree | Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1. There is a possibility that I have heart disease. | 1 | 2 | 3 | 4 |
| 2. There is a good chance I will get heart disease during the next 10 years. | 1 | 2 | 3 | 4 |
| 3. A person who gets heart disease has no chance of being cured. | 1 | 2 | 3 | 4 |
| 4. I have a high chance of getting heart disease because of my past behaviors. | 1 | 2 | 3 | 4 |
| 5. I feel sure that I will get heart disease. | 1 | 2 | 3 | 4 |
| 6. Healthy lifestyle habits are unattainable. | 1 | 2 | 3 | 4 |

| | Strongly Disagree | Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 7. It is likely that I will get heart disease. | 1 | 2 | 3 | 4 |
| 8. I am at risk for getting heart disease. | 1 | 2 | 3 | 4 |
| 9. It is possible that I will get heart disease. | 1 | 2 | 3 | 4 |
| 10. I am not doing anything now that is unhealthy to my heart. | 1 | 2 | 3 | 4 |
| 11. I am too young to have heart disease. | 1 | 2 | 3 | 4 |
| 12. People like me do not get heart disease. | 1 | 2 | 3 | 4 |
| 13. I am very healthy so my body can fight off heart disease. | 1 | 2 | 3 | 4 |
| 14. I am not worried that I might get heart disease. | 1 | 2 | 3 | 4 |
| 15. People my age are too young to get heart disease. | 1 | 2 | 3 | 4 |
| 16. People my age do not get heart disease. | 1 | 2 | 3 | 4 |

| | Strongly Disagree | Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 17. My lifestyle habits do not put me at risk for heart disease. | 1 | 2 | 3 | 4 |
| 18. No matter what I do, if I am going to get heart disease, I will get it. | 1 | 2 | 3 | 4 |
| 19. People who don’t get heart disease are just plain lucky. | 1 | 2 | 3 | 4 |
| 20. The causes of heart disease are unknown. | 1 | 2 | 3 | 4 |

Appendix F

CORONARY HEART DISEASE KNOWLEDGE TOOL FOR WOMEN

Coronary Heart Disease Knowledge Tool for Women

Directions: Circle one best answer.

1. Heart disease related to heart artery blockages develops _____and can easily go undetected.

   a. fast overnight.

   b. fast over weeks.

   c. slowly over months.

   d. slowly over many years.

2. Obesity _____

   a. may cause heart disease.

   b. may prevent heart disease.

   c. has no effect on heart disease.

   d. may make the heart become stronger.

3. Which statement is true regarding symptoms of a heart pain or heart attack?

   a. Chest pain may be a symptom of heart pain or heart attack.

   b. Chest tightness may be a symptom of heart pain or heart attack.

   c. Unusual fatigue may be a symptom of a heart pain or heart attack.

   d. All of the above.

4. Which statement best describes menopause and heart disease related to clogged heart artery?

   a. Women are less likely to get heart disease after menopause than before.

   b. Women are more likely to get heart disease after menopause than before.

   c. Menopause does not increase or decrease the risk of heart disease in women.

   d. There is evidence that women are less likely to get heart disease after menopause than before.

5. Which statement is true regarding heart attack and stroke in women?

   a. African American women are more likely than white women to die from a heart attack or stroke.
   b. African American women are less likely than white women to die from a heart attack or stroke.
   c. African American and white women have the same chance of dying from a heart attack or stroke.
   d. African women are more likely to have heart attack than stroke and white women are more likely to suffer from stroke than heart attack.

6. High _____ may cause heart artery blockages.

a. cholesterol

b. zinc

c. iron

d. calcium

7. Symptoms of heart pain or heart attack may include_____

a. neck, shoulder or arm pain.

b. back pain.

c. dizziness

d. all of the above.

8. Which statement is true regarding heart disease from clogged heart artery in women and men?

a. Women and men become seriously ill or die equally once they are diagnosed or identified as having heart disease.
b. Once women are diagnosed or identified as having heart disease, they are less likely than men to become seriously ill or die.
c. Once women are diagnosed or identified as having heart disease, they are more likely than men to become seriously ill or die.
d. Clogged heart artery is more common in women and more serious in men.

9. What is the effect of stress on heart disease?

a. Stress has no effect on heart disease.

b. Stress may prevent heart disease.

c. Stress may cause heart disease.

d. It has no proof that stress has no effect on heart disease.

10. Which statement is true regarding prevention of heart disease and clogged heart artery in women?

a. Vitamin supplement prevents heart disease.

b. Reducing dietary salt may cause high blood pressure and heart disease.

c. There is no evidence that hormone therapy or replacement prevents heart disease.

d. All of the above.

11. What is the relationship between high blood pressure and heart disease?

a. High blood pressure will make the heart stronger and able to endure more stress.

b. High blood pressure may prevent heart disease.

c. High blood pressure has no effect on heart disease.

d. High blood pressure may cause heart disease.

12. Which statement best describes the relationship between heart disease and stroke?

a. It is true that some forms of heart disease may result in stroke.

b. It is false that some forms of heart disease may result in stroke.

c. It is not certain whether heart disease may result in stroke.

d. Heart disease never causes stroke.

13. What is the effect of dietary fat on heart disease?

a. A high fat diet may prevent heart disease.

b. A high fat diet may cause clogged heart artery.

c. A high fat diet does not affect heart disease.

d. A low fat diet may cause clogged heart artery.

14. Which statement is true about the effect of alcohol on heart disease?

a. Moderate alcohol use (1-2 drinks per day) may cause heart disease.

b. Moderate alcohol use (1-2 drinks per day) may prevent heart disease.

c. The effect of alcohol in preventing heart disease increases as the amount of alcohol use increases.

d. There is no evidence that moderate alcohol use (1-2 drinks per day) may prevent heart disease.

15. Smoking may cause_____

a. high blood pressure.

b. heart valve leakages.

c. heart artery blockages.

d. inflammation of heart muscle.

16. What is the relationship between female hormone and heart disease in women?

a. High level of some female hormone may cause heart disease in women.

b. Low level of some female hormone may increase heart artery blockages in women.

c. Low level of some female hormone may prevent heart disease in women.

d. Level of some female hormone has no effect on heart disease in women.

17. Which statement is true regarding the effect of race on heart disease in women?

a. The chance of getting heart disease is equal in African American and white women.

b. African American women are less likely to have heart disease than white women.

c. African American women are more likely to have heart disease than white women.

d. Both white and African American women rarely have heart disease.

18. How does dietary cholesterol affect heart disease?

a. Reducing dietary cholesterol does not affect heart disease.

b. Reducing dietary cholesterol may make the heart become smaller.

c. Reducing dietary cholesterol may prevent clogged heart artery.

d. Reducing dietary cholesterol may cause heart disease.

19. Which statement is true regarding exercise and heart disease?

a. Excessive exercise may weaken heart muscle.

b. Routine exercise may prevent heart disease.

c. A sedentary lifestyle may prevent heart disease.

d. The benefit of exercise on the prevention of heart disease is not conclusive so it is not important for me to start a routine exercise program.

20. Symptoms of heart pain or heart attack may include_____

a. shortness of breath.

b. sweating.

c. nausea.

d. all of the above.

21. Which statement is true about the effect of red meat on heart disease?

a. Reducing dietary red meat may prevent heart artery blockages.
b. Reducing dietary red meat may cause heart artery blockages.
c. Reducing dietary red meat does not affect heart disease.
d. Reducing dietary red meat may weaken your heart.

22. Which statement best describes the effect of family history on heart disease?

a. A family history of heart disease from clogged heart artery does not affect your risk of getting heart disease.
b. A family history of heart disease from clogged heart artery may increase your risk of getting heart disease.
c. A family history of heart disease from clogged heart artery may decrease your risk of getting heart disease.
d. There is no evidence that a family history of heart disease from clogged heart artery may increase your risk of getting heart disease.

23. What is the relationship between diabetes and heart disease?

a. Heart disease is not related to diabetes.

b. Diabetes may increase the chance of having a heart attack.

c. Diabetes may prevent heart disease.

d. Diabetes makes the heart heal faster after a heart attack.

24. A risk factor of heart disease related to clog heart artery that cannot be changed is _____

a. smoking.

b. heredity.

c. obesity.

d. high blood pressure.

25. What is the leading cause of health care problems and death in women?

a. Heart disease and stroke.

b. Breast cancer.

c. Diabetes.

d. Obesity.

Appendix G

ANSWERS TO CHD KNOWLEDGE TOOL FOR WOMEN

Answers to the Coronary Heart Disease Knowledge Test for Women

1. D

2. A

3. D

4. B

5. A

6. A

7. D

8. C

9. C

10. C

11. D

12. A

13. B

14. B

15. C

16. B

17. C

18. C

19. B

20. D

21. A

22. B

23. B

24. B

25. A

Appendix H

HEALTH PROMOTING LIFESTYLE PROFILE - II

Health-Promoting Lifestyle Profile II

**Directions**: This questionnaire contains statements about your present way of life or personal habits. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequency with which you engage in each behavior by circling:

N for never, S for sometimes, O for often, or R for routinely

| | | **NEVER** | **SOMETIMES** | **OFTEN** | **ROUTINELY** |
|---|---|---|---|---|---|
| 1. | Discuss my problems and concerns with people close to me. | N | S | O | R |
| 2. | Choose a diet low in fat, saturated fat, and cholesterol. | N | S | O | R |
| 3. | Report any unusual signs or symptoms to a physician or other health professional. | N | S | O | R |
| 4. | Follow a planned exercise program. | N | S | O | R |

| | | | | | |
|---|---|---|---|---|---|
| 5. | Get enough sleep. | N | S | O | R |
| 6. | Feel I am growing and changing in positive ways. | N | S | O | R |
| 7. | Praise other people easily for their achievements. | N | S | O | R |
| 8. | Limit use of sugars and food containing sugar (sweets). | N | S | O | R |
| 9. | Read or watch TV programs about improving health. | N | S | O | R |
| 10. | Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, | N | S | O | R |

| | | | | | |
|---|---|---|---|---|---|
| | bicycling, aerobic dancing, using a stair climber). | | | | |
| 11. | Take some time for relaxation each day. | N | S | O | R |
| 12. | Believe that my life has purpose. | N | S | O | R |
| 13. | Maintain meaningful and fulfilling relationships with others. | N | S | O | R |
| 14. | Eat 6-11 servings of bread, cereal, rice and pasta each day. | N | S | O | R |
| 15. | Question health professionals in order to understand their instructions. | N | S | O | R |

| | | | | | |
|---|---|---|---|---|---|
| 16. | Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week). | N | S | O | R |
| 17. | Accept those things in my life which I cannot change. | N | S | O | R |
| 18. | Look forward to the future. | N | S | O | R |
| 19. | Spend time with close friends. | N | S | O | R |
| 20. | Eat 2-4 servings of fruit each day. | N | S | O | R |
| 21. | Get a second opinion when I | N | S | O | R |

| | | | | | |
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| | question my health care provider's advice. | | | | |
| 22. | Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling). | N | S | O | R |
| 23. | Concentrate on pleasant thoughts at bedtime. | N | S | O | R |
| 24. | Feel content and at peace with myself. | N | S | O | R |
| 25. | Find it easy to show concern, love and warmth to others. | N | S | O | R |

| | | | | | |
|---|---|---|---|---|---|
| 26. | Eat 3-5 servings of vegetables each day. | N | S | O | R |
| 27. | Discuss my health concerns with health professionals. | N | S | O | R |
| 28. | Do stretching exercises at least 3 times per week. | N | S | O | R |
| 29. | Use specific methods to control my stress. | N | S | O | R |
| 30. | Work toward long-term goals in my life. | N | S | O | R |
| 31. | Touch and am touched by people I care about. | N | S | O | R |
| 32. | Eat 2-3 servings of milk, yogurt or | N | S | O | R |

| | | | | | |
|---|---|---|---|---|---|
| | cheese each day. | | | | |
| 33. | Inspect my body at least monthly for physical changes/danger signs. | N | S | O | R |
| 34. | Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking). | N | S | O | R |
| 35. | Balance time | N | S | O | R |

| | | | | | |
|---|---|---|---|---|---|
| | between work and play. | | | | |
| 36. | Find each day interesting and challenging. | N | S | O | R |
| 37. | Find ways to meet my needs for intimacy. | N | S | O | R |
| 38. | Eat only 2-3 servings from meat, poultry, fish, dried beans, eggs, and nuts group each day. | N | S | O | R |
| 39. | Ask for information from health professionals about how to take good care of myself. | N | S | O | R |
| 40. | Check my pulse rate when | N | S | O | R |

| | | | | | |
|---|---|---|---|---|---|
| | exercising. | | | | |
| 41. | Practice relaxation or meditation for 15-20 minutes daily. | N | S | O | R |
| 42. | Am aware of what is important to me in life. | N | S | O | R |
| 43. | Get support from a network of caring people. | N | S | O | R |
| 44. | Read labels to identify nutrients, fats, and sodium content in packaged food. | N | S | O | R |
| 45. | Attend educational programs on personal health care. | N | S | O | R |
| 46. | Reach my target heart rate when | N | S | O | R |

| | | | | | |
|---|---|---|---|---|---|
| | exercising. | | | | |
| 47. | Pace myself to prevent tiredness. | N | S | O | R |
| 48. | Feel connected with some force greater than myself. | N | S | O | R |
| 49. | Settle conflicts with others through discussion and compromise. | N | S | O | R |
| 50. | Eat breakfast. | N | S | O | R |
| 51, | Seek guidance or counseling when necessary. | N | S | O | R |
| 52. | Expose myself to new experiences and challenges. | N | S | O | R |

Appendix I

BECK DEPRESSION INVENTORY - II

Beck Depression Inventory - II

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

| | |
|---|---|
| 1. Sadness<br>0 I do not feel sad.<br>1 I feel sad much of the time.<br>2 I am sad all the time.<br>3 I am so sad or unhappy that I can't stand it. | 12. Loss of Interest<br>0 I have not lost interest in other people or activities.<br>1 I am less interested in other people or things than before.<br>2 I have lost most of my interest in other people.<br>3 It's hard to get interested in anything. |
| 2. Pessimism<br>0 I am not discouraged about my future.<br>1 I feel more discouraged about my future than I used to be.<br>2 I do not expect things to work out for me.<br>3 I feel my future is hopeless and will only get worse. | 13. Indecisiveness<br>0 I make decisions about as well as ever.<br>1 I find it more difficult to make decisions than usual.<br>2 I have much greater difficulty in making decisions than I used to.<br>3 I have trouble making any decisions. |
| 3. Past Failure<br>0 I do not feel like a failure.<br>1 I have failed more than I should have.<br>2 As I look back, I see a lot of failures.<br>3 I feel I am a total failure as a person. | 14. Worthlessness<br>0 I do not feel I am worthless.<br>1 I don't consider myself as worthwhile and useful as I used to.<br>2 I feel more worthless as compared to other people.<br>3 I feel utterly worthless. |
| | |

| | |
|---|---|
| 4. Loss of Pleasure<br>0 I get as much pleasure as I ever did from the things I enjoy.<br>1 I don't enjoy things as much as I used to.<br>2 I get very little pleasure from the things I used to enjoy.<br>3 I can't get any pleasure from the things I used to enjoy. | 15. Loss of Energy<br>0 I have as much energy as ever.<br>1 I have less energy than I used to have.<br>2 I don't have enough energy to do very much.<br>3 I don't have enough energy to do anything. |
| 5. Guilty Feelings<br>0 I don't feel particularly guilty.<br>1 I feel guilty over many things I have done or should have done.<br>2 I feel quite guilty most of the time.<br>3 I feel guilty all of the time. | 16. Changes in Sleeping Pattern<br>0 I have not experienced any change in my sleeping pattern.<br>1a I sleep somewhat more than usual.<br>1b I sleep somewhat less than usual.<br>2a I sleep a lot more than usual.<br>2b I sleep a lot less than usual.<br>3a I sleep most of the day.<br>3b I wake up one/two hours early and can't get back to sleep. |
| 6. Punishment Feelings<br>0 I don't feel I am being punished.<br>1 I feel I may be punished.<br>2 I expect to be punished.<br>3 I feel I am being punished. | 17. Irritability<br>0 I am no more irritable than usual.<br>1 I am more irritable than usual.<br>2 I am much more irritable than usual.<br>3 I am irritable all the time. |
| 7. Self-Dislike<br>0 I feel the same about myself as ever.<br>1 I have lost confidence in myself.<br>2 I am disappointed in myself.<br>3 I dislike myself. | 18. Changes in Appetite<br>0 I have not experienced any change in my appetite.<br>1a My appetite is somewhat less than usual.<br>1b My appetite is somewhat greater than usual.<br>2a My appetite is much less than before.<br>2b My appetite is much greater than usual.<br>3a I have not appetite at all. |

| | |
|---|---|
| | 3b I crave food all the time. |
| 8. Self-Criticalness<br>0 I don't criticize or blame myself more than usual.<br>1 I am more critical of myself than I used to be.<br>2 I criticize myself for all of my faults.<br>3 I blame myself for everything bad that happens. | 19. Concentration Difficulty<br>0 I can concentrate as well as ever.<br>1 I can't concentrate as well as usual.<br>2 It's hard to keep my mind on anything for very long.<br>3 I find that I can't concentrate on anything. |
| 9. Suicidal Thoughts or Wishes<br>0 I don't have any thoughts of killing myself.<br>1 I have thoughts of killing myself, but I would not carry them out.<br>2 I would like to kill myself.<br>3 I would kill myself if I had the chance. | 20. Tiredness or Fatigue<br>0 I am no more tired or fatigued than usual.<br>1 I get more tired or fatigued more easily than usual.<br>2 I am too tired or fatigued to do a lot of the things I used to.<br>3 I am too tired or fatigued to do most of the things I used to. |
| 10. Crying<br>0 I don't cry anymore than I used to.<br>1 I cry more than I used to.<br>2 I cry over every little thing.<br>3 I feel like crying, but I can't.<br><br>11. Agitation<br>0 I am no more restless or wound up than usual.<br>1 I feel more restless or wound up than usual.<br>2 I am so restless or agitated that it's hard to stay still.<br>3 I am so restless or agitated that I have to keep moving or doing something. | 21. Loss of Interest in Sex<br>0 I have not noticed any recent change in my interest in sex.<br>1 I am less interested in sex than I used to be.<br>2 I am much less interested in sex now.<br>3 I have lost interest in sex completely. |

Appendix J

INFORMED CONSENT FOR QUESTIONNAIRE PARTICIPANTS

## Informed Consent for Questionnaire Participants Only

## The Relationships among Perceived Coronary Heart Disease Risk, Depression, Health Preventive Behaviors, and Coronary Heart Disease Knowledge in Older Women

The overall purpose of this research study is to examine the relationships among perceived risk of coronary heart disease, coronary heart disease knowledge, depression, and health-preventive behaviors in women 65 to 95 years of age. This research study is for my dissertation and part of the requirements toward a Ph.D. in Counseling Psychology at Oklahoma State University in Stillwater, Oklahoma. My dissertation chairperson, Dr. Sue C. Jacobs, and I, Krysta L. Webster, appreciate your willingness to volunteer for participation in this research study.

You will be asked to participate in a screening prior to participation in this research study, which should take no more than 10 minutes. You will then be asked to complete four questionnaires, which should take no more than 45 minutes to an hour. One questionnaire includes demographic questions, such as about your age, ethnicity, race, and health status. The other three questionnaires ask about your perceptions of your risk for heart disease, your feelings over the past two weeks, your knowledge of heart disease in women, and your personal habits with diet and exercise. After you complete all questionnaires, you will be entered for a chance to win one of four $25 Wal-Mart gift cards once all data is collected. You will be notified if you are a winner.

The benefits of participation in this research study include contributions to the understanding of the associations among perceptions on heart disease, depression, and health behaviors

among older women, which will likely help to develop and promote programs to increase the overall health of older women. There are no known risks associated with participation in this research study than those ordinarily encountered in daily life.

In order to ensure confidentiality, please do not write your name on any of the questionnaires. You will not be identified by your name. Your name will be on the Informed Consent and the Contact Information sheet and will not be linked to the questionnaires. The Contact Information sheet will be used only to contact you if you are a winner of a $25 Wal-Mart gift card. Once the winners are notified, the Contact Information sheets will be destroyed. All returned forms and questionnaires will be transported to campus in a locked briefcase and placed in a secure, locked filing cabinet.

You may withdraw from this research study at any time, without consequences. If you have any questions regarding this research study, you may contact Dr. Sue C. Jacobs, School of Applied Health and Educational Psychology, College of Education, Oklahoma State University, at 1-405-744-9895. You may also contact Ms. Krysta L. Webster, Counseling Psychology doctoral student, at 1-918-845-6526. If you have questions about your rights as a research volunteer, you may contact Dr. Sheila Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, (405) 744-3377 or irb@okstate.edu.

**Participant**: (Print Name) I, _____, have thoroughly read and understand this consent form. I agree to participate in this research study, which examines perceptions of heart disease risk,

depression, heart disease knowledge, and health behaviors among older women. I understand that my participation is strictly voluntary. I also understand that I can withdraw at any time without negative consequences. A copy of this form has been given to me.

_____ _____

Participant's Signature Today's Date

**Researcher**: I certify that I have personally explained this document before requesting that the participant sign it.

_____ _____

Researcher's Signature Today's Date

Appendix K

INFORMED CONSENT FOR INTERVIEW PARTICIPANTS FOR RELATED STUDY

## Informed Consent for Interview Participants

## The Relationships among Perceived Coronary Heart Disease Risk, Depression, Health Preventive Behaviors, and Coronary Heart Disease Knowledge in Older Women

The overall purpose of this research study is to examine the relationships among perceived risk of coronary heart disease, coronary heart disease knowledge, depression, and health-preventive behaviors in women 65 to 95 years of age. This research study is for my dissertation and part of the requirements toward a Ph.D. in Counseling Psychology at Oklahoma State University in Stillwater, Oklahoma. My dissertation chairperson, Dr. Sue C. Jacobs, and I, Krysta L. Webster, appreciate your willingness to volunteer for participation in this research study.

You will be asked to participate in a screening prior to participation in this research study, which should take no more than 10 minutes. The interview will occur after the screening. The interview should take no more than 45-60 minutes to complete. The questions will concern your perceptions and experiences about heart disease and depression. After the interview, you will have the option of taking a break and continuing with the study by completing the four questionnaires or you will be given the option of arranging a different day and time with the researcher to complete them. If you decide to complete the questionnaires on a different day than the interview, the questionnaires should be completed within a week after the interview. The interview questions and your responses to the questionnaires will not be linked.

One questionnaire includes demographic questions, such as about your age, ethnicity, race, and health status. The other three questionnaires ask about your perceptions of your risk for heart disease, your feelings over the past two weeks, your knowledge of heart disease in women, and your personal habits with diet and exercise. The questionnaires should take no more than 45 minutes to an hour to complete.

After the researcher transcribes the interview, the researcher will contact you to set up a time for the researcher to examine with you the accuracy of themes found in the transcriptions. The audiotapes will then be destroyed.

After you complete the interview and all questionnaires, you will be given a $15 Wal-Mart gift card and entered for a chance to win one of four $25 Wal-Mart gift cards once all data is collected. You will be notified if you are a winner.

The benefits of participation in this research study include contributions to the understanding of the associations among perceptions on heart disease, depression, and health behaviors among older women, which will likely help to develop and promote programs to increase the overall health of older women. There are no known risks associated with participation in this research study than those ordinarily encountered in daily life.

In order to ensure confidentiality, please do not write your name on any of the questionnaires. You will not be identified by your name. Your written name will be on the Informed Consent, the Contact Information sheet, and the Consent for Recording form and will not be linked to the questionnaires. The Contact Information sheet will be used only to contact you if you are a

winner of a $25 Wal-Mart gift card. Once the winners are notified, the Contact Information sheets will be destroyed. Identifying information will be on the audiotapes. However, all forms and audiotapes will be transported to campus in a locked briefcase and placed in a secure, locked filing cabinet. The audiotapes and questionnaires will be kept separately in a locked filing cabinet. Once the interviews are transcribed, the Consent for Recording form and audiotapes will be destroyed.

You may withdraw from this research study at any time, without consequences. If you have any questions regarding this research study, you may contact Dr. Sue C. Jacobs, School of Applied Health and Educational Psychology, College of Education, Oklahoma State University, at 1-405-744-9895. You may also contact Ms. Krysta L. Webster, Counseling Psychology doctoral student, at 1-918-845-6526. If you have questions about your rights as a research volunteer, you may contact Dr. Sheila Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, (405) 744-3377 or irb@okstate.edu.

**Participant**: (Print Name) I, _____, have thoroughly read and understand this consent form. I agree to participate in this research study, which examines perceptions of heart disease risk, depression, heart disease knowledge, and health behaviors among older women. I understand that my participation is strictly voluntary. I also understand that I can withdraw at any time without negative consequences. A copy of this form has been given to me.

_____ _____

Participant's Signature Today's Date

**Researcher**: I certify that I have personally explained this document before requesting that the participant sign it.

_____ _____

Researcher's Signature Today's Date

Appendix L

CONSENT FOR RECORDING FOR RELATED STUDY

# Consent for Recording

The purpose of this form is to provide consent for the researcher, Krysta L. Webster, a doctoral student in Counseling Psychology at Oklahoma State University, to audiotape the interview conducted. The purpose of this interview is to examine your perceptions and associations among risk of heart disease, depression, and health-preventive behaviors.

These recordings will not be used for any purposes than for this research project. These recordings will be kept in a locked briefcase for transportation to a locked filing cabinet in the office of my advisor, Sue C. Jacobs, Ph.D., where they will be stored.

If you feel at any time during the interview that you do not want to be recorded any longer, please inform the researcher and the recordings will be stopped. You have the right to decline participation in this experiment at any point. However, by participating in these interviews and questionnaires, you will likely contribute to important data about how older women perceive their risk of heart disease, depression, and health-preventive behaviors.

By signing below, you give the researcher permission to record the interview using audiotape. If you have any additional concerns after the interview, feel free to contact the researcher, Krysta Webster, at 1-918-845-6526or krysta.webster@okstate.edu. You may also contact Dr. Sue C. Jacobs, School of Applied Health and Educational Psychology, College of Education, Oklahoma State University, at 1-405-744-9895.

| | |
|---|---|
| _____ | _____ |
| Participant's Printed Name | Date |
| _____ | _____ |
| Participant's Signature | Researcher's Signature |

Appendix M

CONTACT INFORMATION FORM

Contact Information

First and Last Name:_____

Telephone Number:_____

Mailing Address:_____

Email Address:_____

Preferred way of being contacted:_____

Appendix N

SCRIPT FOR RECRUITMENT

Script for Recruitment

You are invited to volunteer for participation in a study examining the relationships among perceived risk of coronary heart disease, depression, and preventive behaviors in women 65 years of age and older. Your participation will contribute to understanding the relationships among these factors that will hope to promote further research that seeks to establish evidence-based practices for developing, implementing, and promoting interventions and prevention programs to support the well-being of older women.

All volunteers will be entered into a raffle drawing to win one of four $25 Wal-Mart gift cards, which will be drawn at the end of data collection. The total time to complete this study should be no more than 45-60 minutes.

Confidentiality is important to this study, as well as to research in general. As a result, you will be given an identification number that will be used to anonymously identify you. Only my dissertation chairperson, Dr. Sue C. Jacobs, and I, Krysta L. Webster, will have access to the locked and secured data. By volunteering for this study, you are demonstrating a commitment to expanding the body of literature to promote the understandings of the relationships among mental health, physical health, and over well-being of older women.

Please remember that this is voluntary only and that you are in no way obligated to participate. If you would like to volunteer, please contact Ms. Krysta L. Webster, Counseling Psychology doctoral student, at 1-918-845-6526 or at krysta.webster@okstate.edu.

Appendix O

SCRIPT FOR RECRUITMENT OF WOMEN FOR INTERVIEWING

Script for Recruitment of Women for Interviewing

You are invited to participate in a study examining the relationships among perceived risk of coronary heart disease, depression, and health-preventive behaviors in women 65 years of age and older. Your participation will contribute to understanding the relationships among these factors that will hope to promote further research that seeks to establish evidence-based practices for developing, implementing, and promoting interventions and prevention programs to support the well-being of older women.

Eligibility for participation in this study includes all of the following:

- 65 years of age and older
- Either diagnosed by a physician as being at risk of coronary heart disease (for example high blood pressure) or already diagnosed with coronary heart disease (for example, have already had a heart attack)
- Either diagnosed in the past with depression or currently diagnosed with depression.

By volunteering for this study, you are demonstrating a commitment to expanding the body of literature to promote the understandings of the relationships among mental health, physical health, and overall well-being of older women.

Participation consists of an interview that is approximately 45 to 60 minutes in length, as well as four questionnaires to be answered following the interview. The questionnaires will likely take 45-60 minutes. Total time for participation is approximately 2 hours. Volunteers for participation with both the interview and four questionnaires will be given a $15 Wal-Mart gift card and entered for a chance to win one of four $25 Wal-Mart gift cards to be drawn after the collection of all data.

If you meet these criteria and would like to participate, please contact Ms. Krysta L. Webster, Counseling Psychology doctoral student, at 1-918-845-6526 or at krysta.webster@okstate.edu.

Your participation will be vital toward understanding coronary heart disease risk perceptions, depression, and health preventive behaviors in older women.

Appendix P

SCRIPT FOR NEWSLETTERS

Script for Newsletters

Hello! Are you a female between 65 and 95 years of age? If so, would you like to participate in a study that examines heart disease, depression, and health preventive behaviors in women? More studies are needed to examine heart disease and depression specifically in older women. Your participation will likely contribute to better knowledge about these factors, which will help in developing and promoting intervention and prevention programs to support the well-being of older women. The process of participation consists of four questionnaires that should take no more than an hour to complete. You may also be asked to participate in an interview about your perceptions of heart disease and depression, which would take no more than an additional hour to complete. All volunteers will be entered into a raffle drawing to win one of four $25 Wal-Mart gift cards. All information will be kept confidential. Your help is needed! If you would like to volunteer, please contact Ms. Krysta L. Webster, Counseling Psychology doctoral student, at 1-918-845-6526 or at krysta.webster@okstate.edu.

Appendix Q

SCRIPT FOR RECRUITMENT FOR FLIERS

OLDER WOMEN NEEDED!!

If you are a woman between the ages of 65 and 95, you are invited to volunteer for participation in a study examining the relationships among heart disease, depression, and health preventive behaviors. Your participation will likely promote further research to develop and promote programs to support the well-being of older women and understand more about the relationships among mental health, physical health, and the well-being of older women.

All volunteers will be entered into a raffle drawing to win one of four $25 gift cards. The total time to complete this study should be no more than 45-60 minutes. You may be asked to participate in an interview, which would take about an additional hour to complete and would be scheduled at your convenience.

Confidentiality is important. You will be given an identification number that will be used to anonymously identify you. Only my dissertation chairperson, Dr. Sue C. Jacobs, and I, Krysta L. Webster, will have access to the locked and secured data.

If you would like to volunteer to participate, please contact Ms. Krysta L. Webster, Counseling Psychology doctoral student and researcher, at 1-918-845-6526 or at krysta.webster@okstate.edu.

Appendix R

LIST OF INTERVIEW QUESTIONS

Interview Questions for Participants

1.) Tell me about your perceptions of heart disease.

2.) What has your experience with heart disease been?

3.) What does it mean to you to have heart disease?

4.) Tell me about your perceptions of depression?

5.) What has your experience with depression been?

6.) What does it mean to you to have depression?

7.) How do you relate heart disease and depression?

# Appendix S

## DESCRIPTION OF PARTICIPANTS NOT INCLUDED IN ANALYSES

Participant four is a white, widowed female between 76 and 80 years of age. She reported that she did not finish high school and that she was diagnosed with heart disease at 30 years of age. She reported no family history of heart disease. She reported having average knowledge about heart disease and feeling very comfortable discussing her concerns about heart disease with her physician. Participant four reported exercising six days a week for more than one hour. She reported that she does not use tobacco products or take hormones. She reported that she has not been diagnosed with Type 2 Diabetes Mellitus but that she has been diagnosed with high blood pressure and high cholesterol. Her average blood pressure is 152/64. She reported that she weighs 148 lbs. and is five feet ten inches. She reported that she has not been diagnosed with either depression or anxiety and that she talks daily to other people.

Participant 19 is a white, widowed woman between the ages of 81 and 85 years who reported that she either graduated from high school or obtained her GED. She reported that she was diagnosed with heart disease at age 59. She reported that neither of her parents had heart disease but that her brother does. She reported having a little knowledge of heart disease and feeling somewhat comfortable discussing her heart disease concerns with her physician. Participant 19 reported that she does not exercise, that she does not use tobacco product, take hormones, or have a diagnosis of Type 2 Diabetes Mellitus. However, she reported that she has been diagnosed with high blood pressure and high cholesterol. She reported her average blood pressure levels to be 140/70. She reported that she has not been diagnosed as being overweight or obese and that her current weight and height is 162 lbs. and five feet 2 inches, respectively. She

reported that she has been diagnosed with depression 63 years ago. She reported that she has not been diagnosed with anxiety and that she talks regularly to people on a weekly basis.

Participant 67 is an African-American, widowed female between 71 and 75 years of age who reported that she either graduated from high school or attained her GED. She reported that she has not been diagnosed with heart disease but that one of her parents was diagnosed with heart disease. She reported no other family members being diagnosed with heart disease. She reported that she has a little knowledge of heart disease and that she is mostly comfortable talking to her physicians about her concerns about heart disease. She reported that she exercises twice a week between 11 and 20 minutes. She reported that she does not smoke or use other tobacco products. She reported that she has not been diagnosed with Type 2 Diabetes Mellitus but that she has been diagnosed with high blood pressure and high cholesterol. She reported her blood pressure levels to be 140/90. She reported that she has never been diagnosed by her physician as being overweight or obese. She reported that she currently weighs 186 lbs and that her height is five feet, two inches. She reported that she has never been diagnosed with either depression or anxiety and that she talks regularly to other people on a daily basis.

Participant 69 is an African-American, widowed female between 81 and 85 years of age. She reported neither a personal nor a family history of heart disease. She reported having no knowledge of heart disease facts and statistics and feeling a little bit comfortable discussing heart disease-related concerns with her physician. She reported that she does not exercise, that she does not use tobacco products, and that she does not take hormones. She reported that she has been diagnosed with Type 2 Diabetes Mellitus

but did not report her average blood sugar levels. She reported that she has been diagnosed with both high blood pressure and high cholesterol, and she did not document her average blood pressure. She also did not report whether she had been diagnosed as being overweight or obese, and she did not report her current weight and height. She reported that she has not been diagnosed with either depression or anxiety and that she talks regularly to other people on a daily basis.

Participant 72 is an African-American, widowed female between the ages of 65 and 70 years. She reported that her ancestry or ethnic origin is black and American Indian. She reported that she did not finish high school and that she was diagnosed with heart disease at age 65. She reported that her parents were not diagnosed with heart disease but that her grandfather was. She reported having some knowledge of heart disease facts and statistics and feeling mostly comfortable discussing her concerns about heart disease with her physician. She reported that she exercises three days a week for approximately 31 to 40 minutes per day. She reported that she does not smoke cigarettes but that she does but that she does use snuff. She reported that she does not take hormones or have a diagnosis of Type 2 Diabetes Mellitus. However, she reported having a diagnosis of both high blood pressure and high cholesterol. She did not report her average blood pressure levels. She reported that she has not been diagnosed as being overweight or obese, and she reported her current weight and height to be 165 lbs. and five feet, four inches respectively. She reported that she has not been diagnosed with either depression or anxiety and that she talks regularly to others on a daily basis.

Participant 88 is a white, widowed female between 65 and 70 years of age who graduated from high school or obtained her GED. She reported being diagnosed with

heart disease but did not indicate her age at the time of the diagnosis. She reported that one or both of her parents had heart disease, as well as her brothers. She reported having a lot of knowledge about heart disease and feeling very comfortable discussing her concerns about heart disease with her physician. She reported that she exercised five days a week for less than ten minutes and that she does not use tobacco products or take hormones. She reported that she has been diagnosed with Type 2 Diabetes Mellitus and that her average blood sugar level is 120. She reported having a diagnosis of high blood pressure and indicated that her average blood pressure is 140/70. She reported that she has not been diagnosed with high cholesterol or as being overweight or obese. She reported her current weight to be 135 lbs. and her current height to be five feet. She reported that she has not been diagnosed with depression or anxiety and that she talks regularly to others on a daily basis.

# Appendix T

## Themes from Related Qualitative Study

*Categories Exploring the Perceptions on Heart Disease, Depression, and the Potential Relationship between Heart Disease Risk and Depression, Confirmed in the Second Interview*

| Category | Thematic Category | Key Terms | n |
|---|---|---|---|
| Perceptions on Heart Disease | | | |
| H1 | Limited control over past occurrences | Cholesterol, blood pressure, family history, OR overweight | P1,P2,P3 |
| H2 | Limited personal control over future occurrences | Family history, God, heart attack, uncertainty of occurrence | P1,P2,P3,P6 |
| H3 | Controllable behaviors | Medications, diet, reading, caring for others, nitroglycerin patch, OR exercising | P1,P2,P3 |
| H4 | A more manageable disease | Cancer, Alzheimer's, OR better disease | P2, P4, P5 |
| H5 | Coping mechanisms | Role model, volunteering, thinking, avoid thinking, God, OR exercising | P1, P2 |
| HP6 | Family history shapes perceptions | Daddy, brother, mother, granddad, unfair | P1,P2,P3, P4,P6,P7 |
| HP7 | Knowledge | Some | P1,P6 |
| HP8 | Focus on others' needs rather than own | Caregiver, | P1,P2, P4,P6 |
| HP9 | Being a woman with heart disease | Doctors not as concerned | P4 |
| HP10 | Emotions | Worry, fear, frightens | P7 |
| HP11 | Caregiver role | Take care of him | P1,P6, |
| Perceptions on | | | |

| | | | |
|---|---|---|---|
| Depression | | | |
| D1 | Difficult to DESCRIBE | Blue days, hard to describe, triggers | P2,P3,P7,P1 |
| D2 | Avoidance | Not much, head in the sand, others, keep going | P4,P6 |
| D3 | Awareness | Keep going, not allowing, past, triggers, reflecting, loss, age | P1,P2,P3,P5,P8, P7 |
| D4 | Result of external factors | Watching news, economy, unemployment, television shows | P1,P2,P5,P7 |
| D5 | Messages from others | Snap out of it, frustration | P2,P5,P7 |
| D6 | Coping mechanisms | Husband, children, doing for others, bottle up, staying busy, God, television, puzzles | P1, P2,P6 |
| D7 | Limited control | No triggers, | P1,P5,P7 |
| D8 | Difficult to discuss | | P1,P2,P3,P4,P5,P6,P7 |
| D9 | Represents weakness | Embarrassing, shame | P2,P3,P6, P7 |
| D10 | Positive focus | | P1, P2,P4 |
| D11 | Knowledge | Some, lot | P1,P2,P3,P4,P5,P6, P7,P8 |
| D12 | Only know depression when you experience it | Nobody, understood | P5,P6,P7 |
| D14 | Others do not believe you are depressed | | P5,P6, |
| Relationship between Heart Disease Risk | | | |

| | | | |
|---|---|---|---|
| and Depression | | | |
| HD1 | None for self | No, depression before | P1,P3,P8,P6,P4,P2 |
| HD2 | Maybe for others | Could be, don't know | P2,P3,P4, |
| HD3 | Yes for others | | P1,P7 |
| HD4 | Undecided for self | | P2,P3 |
| HD5 | How Relationship may exist | Inherited, stress signals from brain to heart | P4,P7 |
| HD6 | None for others | | P6,P8 |
| HD7 | Yes for self | | P7 |

Krysta Lynette Webster

Candidate for the Degree of

Doctor of Philosophy/Counseling Psychology

DISSERTATION: THE RELATIONSHIPS AMONG PERCEIVED CORONARY HEART DISEASE RISK, DEPRESSION, HEALTH PREVENTIVE BEHAVIORS, AND CORONARY HEART DISEASE KNOWLEDGE IN OLDER WOMEN

Major Field: Educational Psychology with option in Counseling Psychology

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Educational Psychology, Counseling Psychology option at Oklahoma State University, Stillwater, Oklahoma in July, 2011.

Completed the requirements for the Master of Arts in Clinical Psychology at Western Carolina University, Cullowhee, NC in 2005.

Completed the requirements for the Bachelor of Science in Psychology at Wofford College, Spartanburg, SC in 2003.

Experience:
**08/10-07/11**
**University of North Carolina-Chapel Hill Counseling & Wellness Services**
**Chapel Hill, NC**
**07/09-07/10**
**Oklahoma State University College of Osteopathic Medicine: Health Science**
**Center Tulsa Oklahoma State University**
**05/09-12/09**
**Office of Juvenile Affairs: L. E. Rader Treatment Center**
**08/08-08/09**
**Associated Centers for Therapy, Inc.**
**Tulsa, OK**

**Professional Memberships:**
**American Psychological Association**
**Psi Chi**

Name: Krysta Lynette Webster Date of Degree: July 2011

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: THE RELATIONSHIPS AMONG PERCEIVED CORONARY HEART DISEASE RISK, DEPRESSION, HEALTH PREVENTIVE BEHAVIORS, AND CORONARY HEART DISEASE KNOWLEDGE IN OLDER WOMEN

Pages in Study: 235 Candidate for the Degree of Doctor of Philosophy

Major Field: Educational Psychology with the option in Counseling Psychology

Scope and Method of Study: The purpose of this study was to examine the relationships among perceived risk of coronary heart disease (CHD), CHD knowledge, depression, and health preventive behaviors among U. S. women 65 to 95 years of age. A convenience sample of 104 women volunteered for participation in my study. Pearson *r* correlation coefficients were used to examine the associations among perceived risk of heart disease, depression, health behaviors, and CHD knowledge for women without and with a diagnosis of CHD.

Findings and Conclusions: Small to moderate correlations were found between health behaviors and unknown likelihood of developing CHD among women without CHD, suggesting that the more women perceived their risk of CHD to be unknown or delayed in onset, the more they reported engaging in health promoting behaviors. Also, women without CHD who scored higher on the depression measure tended to engage in fewer health promoting behaviors. Similar findings were found in women with CHD. Women with CHD were more depressed in this sample. These results highlight the importance for healthcare professionals to consider in their work with older women. It is also important for interventions that target depression, CHD, and CHD risk among older women to be implemented.

ADVISER'S APPROVAL: Sue C. Jacobs, Ph.D.