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Association of Social Support and Depressive Symptoms Among African Americans

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Abstract

Association of Social Support and Depressive Symptoms Among African Americans with Heart Failure

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MPH, Florida A&M University, 2009

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Depression affects over 120 million individuals worldwide; in the United States, depression is a leading cause of disability for individuals' ages 15-44 years. Social support can affect both physical and depressive symptoms; therefore, most patients with heart failure (HF) need support from family and/or friends to effectively manage their health condition. This indicates family and/or friends are expected to be the core support system for long term care of those with HF. The purpose of this study was to determine whether social support contributes to depressive symptoms among African Americans with HF. The research questions examined the experience of different types of social support, its relationship to depressive symptoms, and its relationship with the change in depressive symptoms overtime among African Americans with HF. This cohort study analyzed secondary data from the Jackson Heart Study Exam 1 2000-2004 (N=287) and Exam 3 2009-2013 (N=254) periods. Chi-square tests and logistic regression analyses were conducted to test each of the research questions. The results of this study showed no significant relationships between social support and depressive symptoms. The findings from this study will assist with the enhancement of access to resources and services by providing additional knowledge regarding social support and depressive symptoms that will improve both mental and cardiovascular health among African Americans.

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Dedication

I would like to first thank my Heavenly Father for the strength to achieve one of my many life's goals; especially during the days I was least motivated. As my favorite scripture reads, "I can do all things through Christ who strengthens me," Philippians 4:13. This dissertation is dedicated to my parents Andrew and Margie Cobbs, for providing the necessary tools to me as a young child that grew up during an era where the future of young African American children was limited. Thank you for your many sacrifices to ensure I was exposed to activities, culture, and places that you yourself have never been exposed to. Your sacrifice has not gone unnoticed, and I hope that the woman I have become has made you proud. I would also like to dedicate this dissertation to my two Guardian Angels, Andrew and Mary Cobbs, that lost their battle to cancer before I could achieve this goal. Thank you for the many words of encouragement throughout my life and for stating to me at the end of your life that "I can do anything I put my mind to, and to always put God first." Lastly, this dissertation is dedicated all women who have ever been told at any point in their life that they cannot achieve a goal because they are "too black", "too aggressive", "too old', or "not good enough". You too can achieve anything you want in life, look yourself in the mirror my sister and repeat after Wonder Woman, "there is no force equal to a woman determined to rise."

Acknowledgments

I would not have been able to reach this amazing milestone without some very important people in my life. First, I would like to thank my dissertation chair Dr. Angela Prehn for your leadership, guidance, knowledge, mentorship, and patience throughout this process. There were times you were my therapist and didn’t know it and I am forever grateful for you. Your impact has shaped me into a better epidemiologist and you have taught me how to prepare myself for a faculty position. Thank you to my other committee members, Dr. Jamuir Robinson and Dr. Mountasser Kadrie for your support, comments, and feedback that further refined my research.

I would like to thank the Jackson Heart Study for the use of their dataset for my research study. Thank you to my undergraduate professor and mentor, Dr. James Bouyer for first introducing me to research, and to my graduate professor Dr. Perry Brown for introducing me to the field of epidemiology. A special thank you to all of my English teachers for teaching me how to effectively construct thoughtful sentences free of grammatical errors.

Finally, I would like to thank some special friends and colleagues for their continued support throughout this process: Felicia Smith, Lateia Brown, Cristi Haygood, Karina Jones, Missy Gautier, Ashley M.B. Singleton, Esq., Sedrick Stewart, Dr. Nkenge Jones-Jacks, Dr. Saudia George, Dr. LaQuita Cooper, and Dr. Kanika Walker.

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Chapter 1: Introduction to the Study

Introduction

Depression affects over 120 million individuals worldwide (Lepine & Briley, 2012). In the United States, depression is a leading cause of disability for individuals ages 15-44 years, which results in approximately 400 million disability days per year (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015). Epidemiologic surveys have shown that among the U.S. general population the prevalence of depression is 10-15% (Lepine & Briley, 2012). African Americans have lower lifetime rate of depression compared to Non-Hispanic Whites. The rates of depression among African Americans are overrepresented in areas that are high-need of mental health service, in which they have less access to these services, and often receive poorer quality of care than Whites (Williams, Gonzalez, Neighbors, Nesse, Abelson, Sweetman et al., 2007). Williams and colleagues (2007) found that the chronicity of depression in high-need areas was 56% for African Americans and Caribbean blacks compared to 38.6% for Whites. Importantly, depression is a contributing factor to increased risk of cardiovascular diseases, with a 1.5-time increased risk on average among those with coronary artery disease (Baune et al., 2012).

When looking at cardiovascular diseases such as heart failure (HF), African Americans have an increased risk of HF development, which is associated with an increase in morbidity and mortality compared to their White counterparts (Mentz et al., 2015; Piamjariyakul, Thompson, Russell, & Smith, 2018; Spikes et al., 2019; Wierenga, 2017; Woda, Belknap, Haglund, Sebern, & Lawerence, 2015). Additionally, the health-related quality of life is worse among those with HF, with symptoms such as fatigue and depression being strongly associated with poor quality of life (Heo, Lennie, Moser, & Kennedy, 2014). Overall, physical symptoms can cause an individual with HF to avoid performing daily activities which further leads to poorer quality of life. However, social support can affect both physical and depressive symptoms through its effect on self-care, such as adhering to medication treatment and low-sodium diet (Heo et al., 2014). Although previous evidence has shown an association with social support and depressive symptoms among those with HF (Heo et al., 2014), and elevated depressive symptoms and clinical depression are common with an increase in adverse event rates, these studies were conducted primarily among White populations (Mentz et al., 2015).

This study was designed to determine whether social support is associated with depressive symptoms among African Americans with HF. This chapter provides background on the importance of this study, describe the public health problem, affirm the research questions that will be answered, justify the conceptual framework used, and illustrate the contribution of this study to public health.

Background

Depression is a feeling of a mood that is flat to one that can be severe, disabling, and sometimes recurrent (Hare et al., 2014). While some individuals with cardiovascular disease seem to be unhappier than others, the feeling of depression may be a result of the cardiac event with the most common being a change in the individual’s mood (Hare et al., 2014). According to Hare et al. (2014), the prevalence of depression among individuals with cardiovascular disease is variable, and it has been acknowledged that two-thirds of patients hospitalized for a cardiac event have some form of mild depressive symptoms. Individuals with chronic HF are more prevalent to having depression, with 20% of the prevalence related to the severity of the condition, and it is a convincing predictor of mortality and hospital readmission (Hare et al., 2014). For example, it has been shown that after bypass surgery, 15-20% of patients experience depression (Hare et al., 2014).

Most patients with HF need support from family and/or friends to effectively manage their health condition, indicating that family and/or friends are expected to be the core support system for long term care of those with HF (Chung, Lennie, Dekker, Rong Wu, & Moser, 2011). Additionally, social support can be divided into perceived or received support with perceived being the most important for health (Hansen, Zinckernagel, Schneekloth, Zwisler, & Holmberg, 2017). Studies have examined different indicators and measured different characteristics of social support showing that support by relatives may prevent depression among HF patients (Chung et al., 2011; Hansen et al., 2017). Consequently, increased depression has been shown to be associated with living alone and having no family-friend visits at the hospital; and low perceived emotional support such as dysfunctional family, low to no spousal support, and loneliness have been found to be related to increased depression (Chung et al., 2011; Hansen et al., 2017).

As stated by Graven and Grant (2014), “Social support is a multi-faceted concept that positively influences disease-related outcomes in multiple chronic illnesses, including heart failure” (p. 321). It can be defined as aid or assistance provided through a form of social relationship (Graven & Grant, 2014; Haney & Israel, 2002, pp. 185-209). There are four types of social support: emotional support (love and caring), instrumental support (practical), informational support (informational and advice), and appraisal support (constructive feedback; Chung et al, 2011; Graven & Grant, 2014; Hansen et al., 2017). Another term, social network, describes a way of providing social support to others such as family and/or friends, in which family is the most influential members of a social network and have positively influenced HF outcomes (Graven & Grant, 2014).

When looking at positive social support, there is an association with improved quality of life, better medication adherence, a decrease in hospital readmission, and higher expertise in HF self-care (Chung, Mosor, Lennie, & Frazier, 2013; Lu et al., 2016; Mard & Nielsen, 2016) among those with HF. Although there has been a link between social support and decreased morbidity, mortality, and increased likelihood of recovery, it is suggested that reinforcing and increasing social support may be effective in improving quality of life and reducing morbidity and mortality among those with HF (Chung et al., 2013). The support provided by a spouse or lifetime partner is considered the highest form of social support (Lu et al., 2016), and when comparing those with spousal support to those not having spousal support there is a 2.1-3.8 times greater risk of hospital readmission or death among those that are unmarried with HF (Chung et al., 2013). Although a positive association between social support and symptoms of depression among those with HF has been shown, there is still lack of information regarding this association among African Americans (Heo et al., 2014; Mentz et al., 2015). Therefore, I assessed the types of social support and their relationship to depressive symptoms among African Americans with HF.

Problem Statement

Despite the mortality decrease over the past decades, heart disease is still one of the most common causes of mortality worldwide (Hansen et al, 2017; The Heart Foundation, 2015). An estimated 1-2% of the adult population has HF and almost 50% die within 4 years of diagnosis (Mard & Nielsen, 2016). The prevalence of HF is steadily increasing in the United States with currently 5.8 million Americans living with HF (Chung, Mosor, Lennie, & Frazier, 2013), and it is expected to increase by 25% by 2030 (Lu et al., 2016). African Americans have the highest risk of developing HF, present with symptoms at an earlier age, and have worse outcomes compared to the general population (Lu et al., 2016; Sharma, Colvin-Adams, & Yancy, 2014). Additionally, African Americans are more likely to be hospitalized for HF and are 45% more likely to die or have a decline in functional status compared to their White counterparts (Lu et al., 2016).

Similarly, for individuals' ages 15-44 years of age, depression is a leading cause of disability resulting in approximately 400 million disability days per year (Greenberg et al., 2015). As well, depression is a causal factor for the increased risk of cardiovascular diseases (CVD), with a 1.5-time increased risk on average and a two to three-time increased risk among individuals with heart disease (Baune et al, 2012). Some estimated 30-40% of HF patients develop either anxiety and/or depression after being diagnosed (Murphy, Ludeman, & Elliott, 2014), which is a more frequent diagnosis than the general population (Hansen et al., 2017). Among those with HF, depressive symptoms are the most prevalent psychological symptom identified (Chung et al., 2013). Depressive symptoms among those with HF are associated with declining physical function and is a predictor of poorer quality of life (Chung et al., 2013). The more serious impact of these symptoms is the frequent hospital readmission and increased mortality (Chung et al., 2013). Furthermore, depression complicates the treatment causing patients to have a poorer chance for recovery and longtime survival (Hansen et al., 2017; Murphy et al., 2014). When examining the association between depression and HF among African Americans, research findings have shown negative psychosocial factors contribute to the association (Sims, Lipford et al., 2017). As an example, symptoms of depression have been associated with coronary heart disease (Sims, Redmond et al., 2015) and major depressive symptoms have been associated with risks of incident stroke and coronary heart disease (O'Brien et al., 2015).

Moreover, several prognostic determinants have also been identified with HF such as social support (Heo et al., 2014; Mard & Nielsen, 2016). As previously mentioned, social support has a significant impact on health and well-being in general and has been associated with better self-care and medication adherence among those with HF (Mard & Nielsen, 2016). Although evidence from previous studies has shown that depressive symptoms and lack of or poor social support predict poor outcomes among those with HF, the majority of studies have been primarily among large populations of White adults even though HF is higher among African Americans (Chung et al., 2011; Mard & Nielsen, 2016). Additionally, there have been inconsistent findings regarding whether the number of social network members or marital status has an association on depression among those with HF, with some studies showing no association (Hansen et al., 2017). Lastly, there is a lack of research regarding the relationship between social support and depressive symptoms among African Americans with HF which indicated the need to investigate this relationship further.

Purpose of Study

The purpose of this quantitative research study was to determine whether social support contributes to depressive symptoms among African Americans with HF in the Jackson Heart Study (JHS). Particularly, I examined the experience of different types of social support, its relationship to depressive symptoms, and its relationship with the change in depressive symptoms over time among JHS participants with HF.

Research Questions and Hypotheses

The research questions for this study examined the relationship between social support and depressive symptoms among patients with HF. Hypotheses were identified to test each of the research questions as follows:

RQ1: What is the relationship between social support as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1?

H_a1_1: There will be an association between marital status as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

$H_{0}1_{1}$: There will not be an association between marital status as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

$H_{a}1_{2}$: There will be an association between family/friend relationships as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

$H_{0}1_{2}$: There will not be an association between family/friend relationships as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

$H_{a}1_{3}$: There will be an association between social networks as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

$H_{0}1_{3}$: There will not be an association between social networks as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

$H_{a}1_{4}$: There will be an association between emotional support as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

$H_{0}1_{4}$: There will not be an association between emotional support as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

RQ2: To what extent does social support as measured by the Social Support Form predict depressive symptoms as measured by the Major Depressive Episode Form (MDEA) among JHS participants with HF during Exam 3?

H_a2_1: There will be associations between marital status as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_1: There will not be associations between marital status as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_a2_2: There will be associations between family/friend relationships as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_2: There will not be associations between family/friend relationships as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_a2_3: There will be associations between social networks as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_3: There will not be associations between social networks as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_a2_4: There will be associations between emotional support as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_4: There will not be associations between emotional support as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

RQ3: What is the association between social support and the change in depressive symptoms from Exam 1 as measured by the CES-D depression scale and Exam 3 as measured by the MDEA among JHS participants with HF?

H_a3_1: There will be an association between marital status as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_03_1: There will not be an association between marital status as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_a3_2: There will be an association between family/friend relationships as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

$H_0 3_2$: There will not be an association between family/friend relationships as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

$H_a 3_3$: There will be an association between social networks as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

$H_0 3_3$: There will not be an association between social networks as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

$H_a 3_4$: There will be an association between emotional support as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

$H_0 3_4$: There will not be an association between emotional support as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

Conceptual Framework

Wilson and Cleary (1995) developed a conceptual model of patient outcomes to link clinical variables with health-related quality of life (HRQoL). When this model was first developed there was little research that conceptualized the relationship of clinical variables to measure HRQoL. One problem that hindered the progress was the lack of conceptual models that specified how different types of patient outcome measures correlated (Wilson & Cleary, 1995). The model needed to involve both the clinical and social science paradigm, with the clinical focusing on the etiology, biological, physiological, and clinical outcomes. On the other hand, the social science focused on functioning and overall well-being (Wilson & Cleary, 1995).

Prior to this model's development, other researchers proposed models that were prompted by observation; therefore, Wilson and Cleary (1995) developed a model that focused on the relationships between different aspects of health on a continuum. As shown in Figure 1, there are five areas covered along the continuum starting with biological and physiological measures, symptom status, functional status, general health perceptions and ending with overall quality of life (Wilson & Cleary, 1995).

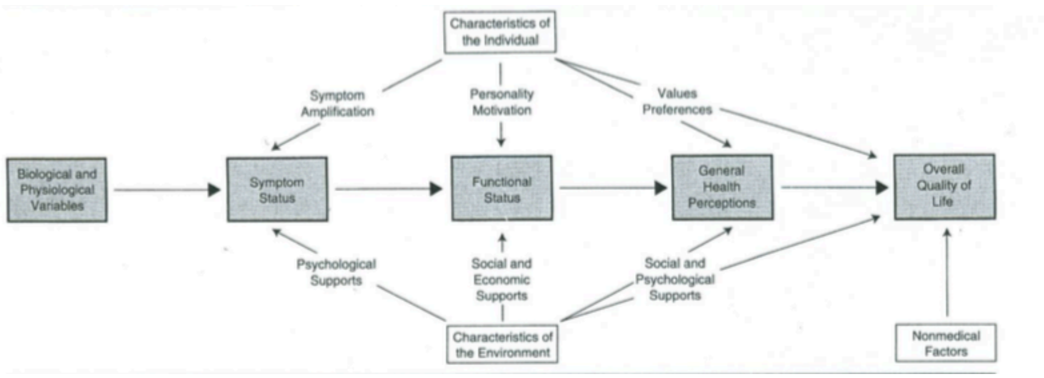

Figure 1. Wilson and Cleary conceptual model. From “Linking Clinical Variables with Health-Related Quality of Life: A Conceptual Model of Patient Outcomes”, by Wilson & Cleary, 1995, *Journal of the American Medical Association*, *273*(1), p.60. Reprinted, permission not needed. The model describes the relationship among measures of patient outcome in a health-related quality of life conceptual model.

Biological and physical factors focus on the function of cell, organs, and organ systems; however, the assessment of symptoms shifts this focus (Wilson & Cleary, 1995). Physical symptoms can be defined as a perception or feeling about the state of one’s body. Additionally, psychological symptoms are associated with mental health (Wilson & Cleary, 1995). Functional status is also important because it assess the ability of the individual to perform tasks such as medication adherence. Moreover, personality and motivation also play a role in functional status in that an individual’s social environment may affect his/her functioning (i.e. family/friend support; Wilson & Cleary, 1995). General health perceptions are a result of the observation that they are predictors of an individual’s use of medical and mental health services (Wilson & Cleary, 199%). Functional status can be associated with general health perceptions. Lastly, overall quality of life is typically assessed by asking patients about their overall well-being of how happy and/or satisfied he/she is with his/her life (Wilson & Cleary, 1995).

Twenty years after its development, this model has been revised to suggest that social support may be related to both symptoms and HRQoL (Heo et al., 2014). Social support can affect physical symptoms through its effect on self-care. For example, there is an association with social support and medication adherence and low sodium diet (Heo et al., 2014). As shown in Figure 2, structural support signifies the existence of a social network and the features of the contacts within the network, such as marital status and social network (Heo et al., 2014). Marital status refers to a simple social network such as spouse or cohabitant, whereas social network comprises a wider range of social networks beyond a spouse, including extended relatives, friends, and society (Heo et al., 2014). Like the original model, the functional support signifies the individual's perception of the resources provided by the social network, such as emotional, instrumental, and relationship with health care provider. Interestingly, family relationships as shown in Figure 2 can be a combination of structural and/or functional support (Heo et al., 2014). The revised version of this model was more relevant for this research study to examine the association of social support and depressive symptoms among those with HF and the rationale will be discussed further in Chapter 2.

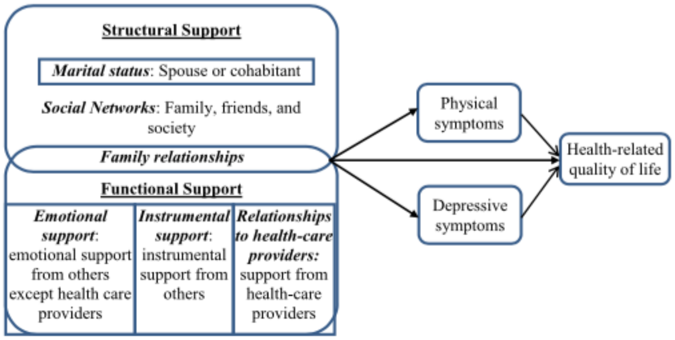

Figure 2. Wilson and Clearyc model, revised from "Types of social support and their relationships to physical and depressive symptoms and health-related quality of life in patients with heart failure, by Heo et al, 2014, *Heart and Lung 43, p.300*. Reprinted, with permission. The model describes the relationship different types of social support, depressive and physical symptoms, and health-related quality of life.

Nature of the Study

This research study was a cohort analysis of data from the JHS Exam 1 (2000-2004) and Exam 3 (2009-2013) periods to determine whether or not social support contributes to depressive symptoms among African Americans with HF (JHS, 2016). The JHS collected data that was used to measure social support regarding participant's relationships with family and friends, depressive symptoms, and HF. To understand this pathway, an examination of the relationship between the type of social support (marital status, family/friend relationships, social network, and emotional support) and symptoms of depression; how the type of social support predicted depressive symptoms; and the association of social support to the change in depressive symptoms among HF subjects over time.

Access to the JHS data was granted with a research proposal I submitted and was approved by the Publications Committee of JHS. The research proposal described the proposed study, the variables needed, and the data analysis that would be conducted. Once the data was received, a dataset specific for this research study was created for data analysis.

Definitions of Key Terms

The key terms that was used for this research study are based on variables from the data collection forms used in the JHS.

Coping: Coping is a process used by individuals in order to manage a stressful situation along with the accompanied emotions (Graven, Grant, & Gordon, 2015).

Depression: According to the American Psychiatric Association (APA), is a common and serious medical illness that affects the way one feels, think, and act (APA, 2018). Depression may cause feelings of sadness/or loss of interest in activities (APA, 2018).

Depressive Symptoms: Depressive symptoms may be mild to severe and include feeling sad or depressed mood, loss of interest, change in appetite, loss of energy, or trouble sleeping (APA, 2018).

Emotional Support: Refers to subtle support from others besides health care providers (Heo et al., 2014). Additionally, emotional support is an individuals' perception of support from family, friends, and others (Heo et al., 2014), which can be measured using the Social Support Form (JHS, 2016).

Family: Family have played an important role in the lives of African Americans; providing support to individuals to cope with daily stress, providing emotional support, and providing caregiving (Taylor, Chae, Lincoln, & Chatters, 2015).

Heart Failure: According to the American Heart Association (AHA; 2018), heart failure is a chronic progressive condition, in which the heart muscle is unable to pump enough blood to meet the body's need for blood and oxygen .

Marital Status: A social network provided by a spouse or cohabitant (Heo et al., 2014). Using the sociodemographic form, marital status is categorized as married, not married/cohabitating, single, divorced, or widowed (Heo et al., 2014).

Self-Care: Behaviors aimed at disease management and well-being that can be done by HF patient and/or social network (Graven & Grant, 2014). These activities that are initiated may include, medication adherence, maintaining low sodium diet, participating in regular exercise, and monitoring symptoms.

Social Network: The channel in which social support is provided and includes family and friends (Graven & Grant, 2014). It is also the size, structure, and frequency of contact with the individual with HF (Graven & Grant, 2014). Family is the most influential members of a person's social network and have shown to have positive effect in HF outcomes (Graven & Grant, 2014).

Social Support: A multifaceted concept that influences disease outcomes in a positive way (Graven & Grant, 2014). Four types of social support include (a) emotional, (b) informational, (c) instrumental, and (d) appraisal support. Social support will be defined by self-reported perceived social support from the Social Support Form completed during the JHS.

Stress: Stress is the relationship between an individual and his/her environment that when assessed is determined to serve as a threat to the individual's well-being (Graven et al., 2015).

Assumptions

As with many research studies, there are assumptions about this study's population, data, and standpoint that are necessary. I assumed the participants of the JHS were comfortable self-reporting information regarding his/her relationships with family and friends as well as reporting symptoms of depression without bias. The JHS is the largest single-site prospective study of cardiovascular disease among African Americans (Taylor, 2003). The project was funded by the National Heart, Lung, and Blood Institute and the National Center for Minority Health and Health Disparities to investigate the factors that influence the development of cardiovascular diseases among African American men and women (JHS, 2016). The JHS was an extension of the Arthrosclerosis Risk in Communities (ARIC) study that started in 1987 assessing participants for long-term observation of risk factors for CVD (Fuqua et al., 2005). Lastly, for this study, I assumed the change in depressive symptoms over time will be an accurate measure of depression because both the CES-D and MDEA have been validated to be used to diagnosis depression; and they both are commonly used to measure symptoms of depression.

Limitations and Delimitations

Like other studies, there are limitations with this research study findings. First, this study used a secondary dataset; therefore, there are limitations of the specificity of this study's data due to the fixed questions from the questionnaires. For example, the data for social support is related to the participants perception of being loved and cared for by spouse, other family, and friends, as well as the participants involvement with other social networks. This does not include the entire definition of social support, which also covers informational and instrumental support. Second, the JHS researchers decided to use a different instrument during Exam 3 to measure symptoms of depression because they felt having a direct examination of whether a participant had major depressive episodes would add value to the relationship between the onset of physical disease and depression (JHS, 2010). Third, the Social Support form was only administered during Exam 1, so there is a limitation in knowing whether there was any change to social support during Exam 3. Fourth, this study only included African Americans residing in Jackson, MS, which means the study findings are not generalizable to all African Americans residing in Mississippi or across the United States. However, the limitations do justify the need for future research to be conducted including other geographical areas and a more specific methodology. Lastly, there is not any information regarding the self-report of HF for the JHS to date; therefore, a misclassification of participants is possible.

Significance of Study

This research study will help fill a gap to understand whether social support contributes to depressive symptoms among African Americans with HF. This study is important because it addresses two major concerns, social support, and depression, among one of the largest community-based cohort studies of African Americans. Additionally, this research study is the first study to be done with JHS participants addressing social support and examining Exam Periods 1 and 3. The results of this study provides insights into the types of social support associated with depressive symptoms among those with HF, which can aid stakeholders such as the Depression and Bipolar Support Alliance (DBSA) to improve the lives of African Americans with depression by providing educational and emotional support. Moreover, engaging local, state, and national policy makers as well as new stakeholders such as Patient-Centered Outcomes Research Institute (PCORI) to provide information for effective communication regarding HF among African Americans.

The research findings of this study may provide evidence that is needed for policy changes and practices. With the provision of educational and emotional support, engagement of stakeholders, and policy changes, these efforts will affect African Americans with depression and HF by increasing their overall quality of life. The social change from this study is the enhancement of access to resources and services and that will improve both mental and cardiovascular health among African Americans.

Conclusions

Depression is a major cause of morbidity, mortality, and disability in the United States. Additionally, HF is associated with an increase in morbidity and mortality among African Americans. I explored types of social support and their relationship to depressive symptoms among African Americans with HF to provide an understanding of why African Americans with HF have poorer outcomes compared to their White counterparts. In Chapter 2, the impact of different types of social support and its relationship to depressive symptoms among African Americans with HF was examined identifying the gaps in research. The findings of this study provide insight into the types of social support associated with depressive symptoms among those with HF, which can aid stakeholders to improve the lives of African Americans with depression by providing educational and emotional support. Additionally, engaging local, state, and national policy makers as well as new stakeholders to provide information for effective communication regarding HF among African Americans.

Chapter 2: Literature Review

Introduction

The purpose of this quantitative research study was to determine whether social support contributes to depressive symptoms among African Americans with heart failure in the JHS. Particularly, I examined the experience of different types of social support, its relationship to depressive symptoms, and its relationship with the change in depressive symptoms overtime among JHS participants with heart failure.

Although studies have shown an association with social support and symptoms of depression among individuals with heart failure, there is lack of information regarding this association among African Americans. This chapter will discuss the impact of different types of social support and its relationship to depressive symptoms among those with heart failure. Additionally, this chapter will discuss known information about heart failure and depression, social support, and the use of the JHS for this study.

The literature review was conducted with a list of keywords that was used to identify the research studies covered within this chapter. Electronic databases, including Science Direct, ProQuest, CINAHL, Psych Info, and SCOPUS, as well as, search engines such as Google Scholar and EBSCO Host were used to conduct an exhaustive search to identify publications based on the following keywords: *heart failure among African Americans, depression in the US, depression among African Americans, heart failure and depression among African Americans, epidemiology of heart failure, heart failure in the US, heart failure among African Americans, incidence and prevalence of heart failure, depression and heart failure, social support and heart failure, social support and* *depression, heart failure and depression in the Jackson Heart Study, marital status and heart failure, family and friend relationship to heart failure, social network and heart failure among African Americans, coping and stress among African Americans with heart failure, caregiver model, caregiver model,* and *heart failure.* Additionally, I searched for publications that were listed in the reference lists of the articles I found.

The initial review of the literature was limited to peer review journal publications between 2012 and 2019; however, there were a few older publications that were included due to their citation by current publications. For inclusion in my literature review, I thoroughly reviewed the publications based on relevance to my research study, support of my study's importance, and identifying the gaps indicating the need for future research.

This literature review provides relevant information to guide a study on the association between social support and depressive symptoms among African Americans with heart failure. Additionally, I provide an overview of the etiology of heart failure, incidence and prevalence of heart failure, heart failure and depression in the United States, social support and heart failure, and the reasoning for the inclusion of the Wilson and Cleary Model.

Etiology of Heart Failure

Heart failure (HF) is a complex, incurable, chronic illness that has multiple causes and symptoms, including shortness of breath, fatigue, rapid or irregular heartbeat, swelling in the legs, sleep apnea, and difficulties with physical activity (Grigorovich et al., 2017). There are several conditions, genetics, and systemic diseases that can result in

HF, as well as 17 primary etiologies of HF, but more than two-thirds of all HF cases are attributed to either: ischemic heart disease, chronic obstructive pulmonary disease, hypertensive heart disease, or rheumatic heart disease (Ziaeian & Fonarow, 2016). Individuals with HF usually have multiple comorbidities, functional limitations, and psychological symptoms that interfere with everyday tasks and long-term prognosis (Grigorovich et al., 2017). Additionally, HF is a progressive condition, in which patients may experience episodes of acute symptoms worsening and requiring emergency treatment or hospitalization (Grigorovich et al., 2017).

Epidemiology of Heart Failure

HF is considered a global epidemic with an increasing incidence since the 1970s, and a prevalence of more than 38 million globally (Ziaeian & Fonarow, 2016). According to the Global Burden of Disease Study in 2013, 17 million individuals died from a cardiovascular disease, a 41% increase from 1990 (Ziaeian & Fonarow, 2016). The demographic shift, particularly the aging population, is the primary cause for the increase in cardiovascular disease burden. From 1979 to 2004 the number of hospitalizations for HF tripled from 1.27 million to 3.86 million, respectively, indicating an economic burden on the healthcare system (Ziaeian & Fonarow, 2016).

In the United States, due to the high prevalence, mortality, morbidity, and healthcare costs, HF is an important public health issue (Heidenreich et al., 2013). There were an estimated 6 million individuals living with HF in 2011 and 870,000 new cases annually (Mozaffarian et al., 2016; Young et al., 2014; Ziaeian & Fonarow, 2016), and the 5-year survival rate for HF increased by 9% from 1979-2010 in the United States

(Ziaeian & Fonarow, 2016). According to Young et al. (2014), an estimated 20% of adults will be diagnosed with HF during their lifetime, with more than 8 million Americans living with HF by 2030.

Incidence

When looking at the global incidence of HF, the estimates are unreliable because the majority of the literature pertaining to the epidemiology of HF and management comes from a high-income population in developed nations (Brouwers, de Boer, & van der Harst, 2013; Meyer et al., 2015; Ziaeian & Fonarow, 2016). Moreover, in 2012 the Atherosclerosis Risk in Communities (ARIC) study assessed trends in hospitalizations and fatality rates in the United States, estimating 915,000 new cases of HF (Brouwers et al., 2013; Meyer et al., 2015; Ziaeian & Fonarow, 2016). The two community-based cohorts that have provided some reliable information on the incidence and prevalence of HF is the Framingham and Olmsted County studies. The Framingham Heart Study, for more than 65 years, reported on risk factors, prevalence, and paths of several cardiovascular diseases (citation). Although the criteria for diagnosis and methods have not changed over the years, both cohorts consisted of predominately White populations and the trends are not generalizable to ethnically diverse populations (Ziaeian & Fonarow, 2016).

As noted by Ziaeian and Fonarow (2016) there has been stability over the past 60 years with the incidence of HF in the United States, and a decrease in age-adjusted rates. The Framingham cohort showed a decrease from 420 to 327/100,000 person-years in the incidence of HF among women from 1950-1999 (citation). Contrarily, there was not a reduction for men, whose incidence for HF has remained at 564 cases/100,000 person-years (Brouwers et al., 2013; Ziaeian & Fonarow, 2016). On the other hand, from 2000-2010, the age-adjusted and sex-adjusted incidence declined from 315.8 to 219.3/100,000 person-years in the Olmsted County cohort. Like the Framingham cohort, there was a much greater decrease in HF incidence for women (43%) than men (29%; Ziaeian & Fonarow, 2016). Women with HF are generally older, have higher body mass index (BMI), and have higher prevalence of hypertension and diabetes; however, they have lower mortality than men (Meyer et al., 2015). When looking at the incidence of HF among racial groups, the Multi-Ethnic Study of Atherosclerosis reported the highest incidence rate of HF among African Americans (Meyer et al., 2015; Ziaeian & Fonarow, 2016). The ethnic disparity of the HF is attributable to differences in risk factors such as: poor diet, lack of physical activity and medication adherence, and socioeconomic status (Ziaeian & Fonarow, 2016). Add summary and synthesis throughout the paragraph to balance out the use of information from the literature with your own analysis.

Prevalence

As mentioned, there are 38 million individuals living with HF worldwide, with the prevalence in developed countries ranging from 1-2% of the adult population (Meyer et al., 2015; Ziaeian & Fonarow, 2016). As of 2012 in the United States, 2.4% of the population has HF with the prevalence increasing with age such that among adults 80 years of age and older, 12% of men and women have HF (Heidenreich et al., 2013). Even though there have been reductions in the age-adjusted incidence and prevalence of HF, there have been a drastic increase in the number of individuals with HF that could be due to the shift in age distribution and the population growth (Ziaeian & Fonarow, 2016).

Prior to the 1970s, the prevalence of HF in the United States was determined using hospital records or death certificates. The first National Health and Nutrition Examination Survey (NHANES) provided more accurate estimations of the prevalence in the United States (Ziaeian & Fonarow, 2016). This data from 1971-1975 estimated the prevalence was 1-2%, respectively, and data from 2009-2012 estimated 6 million adults in the US with HF (Mozaffarian et al., 2016; Ziaeian & Fonarow, 2016). There is a disproportionate burden of HF among the elderly, with over half of hospitalized patients being over 75 years of age (Ziaeian & Fonarow, 2016). It has been shown that the prevalence of HF generally doubles for each decade of life; less than 1% for individuals under 40 years of age and more than 10% for individuals over the age of 80 years (Ziaeian & Fonarow, 2016). Additionally, the lifetime risk of developing HF is 20% between ages 40-80 for both men and women (Ziaeian & Fonarow, 2016). According to the AHA's projections of HF in the United States, by 2030 more than 8 million Americans will be living with HF with one-fourth of them being over the age of 80 years (Heidenreich et al., 2013). Additionally, the prevalence of HF is expected to increase by 23% from by 2030 (Heidenreich et al., 2013). Add summary and synthesis.

Likewise, the aging population will increase the cost of care for older adults with HF at a much faster rate than younger adults (Heidenreich et al., 2013) with a projected increase to $53.1 billion by 2030 (Young et al., 2014). This increase will be three-fold for adults over 65 years of age (Heidenreich et al., 2013). Overall, the total expenditures to treat adults over 65 years of age will increase from 69% in 2012 to 80% in 2030 (Heidenreich et al., 2013). According to previous research, there is an underrepresentation of older populations in research that have been done, which illustrates the need for future research to represent this population to improve outcomes within this age cohort (Heidenreich et al., 2013).

The prevalence of HF varies by ethnicity, socioeconomic status (SES), and geographical location in the United States. For instance, it has been shown that lower SES is associated with higher rates of HF when cardiovascular risk factors are controlled (Hawkins, Jhund, McMurray, & Capewell, 2012; Ramsay, 2014; Ziaeian & Fonarow, 2016). African Americans have a threefold increased risk of developing HF when SES and comorbidities are controlled (Young et al., 2014; Ziaeian & Fonarow, 2016), and they are expected to continuously have the highest prevalence of HF with a 29% increase by 2030 (Heidenreich et al., 2013). Add summary and synthesis to fully develop and then conclude the paragraph.

Mortality

Geographically, the southeastern region of the United States from Georgia to Oklahoma has a 69% higher age-adjusted mortality from HF than the national average (Ziaeian & Fonarow, 2016). It has been challenging estimating the number of deaths that are attributable to HF because HF is often categorized as an intermediate stage of an underlying condition instead of the actual cause of death (Ziaeian & Fonarow, 2016). Although the Global Burden of Disease study used ICD-9 and ICD-10 codes to define the cause of death, the code for HF is very vague and is associated with a nonspecific cause of death (Ziaeian & Fonarow, 2016). In the United States, one in nine death certificates lists HF as a cause of death (Mozaffarian et al., 2016). Despite the high fatality rate of HF, the survival rates have increased due the advances in treatment (Ziaeian & Fonarow, 2016). The 5-year mortality rate decline in the Framingham Heart Study from 70% between 1950-1969 to 59% between 1990-1999 for men and 57% to 45%, respectively for women (Ziaeian & Fonarow, 2016). On the other hand, the age-adjusted mortality reported by the Olmsted County cohort was 20.2% for incident HF at 1-year and 56% at 5-years, with no change between 2005-2010 (Ziaeian & Fonarow, 2016). Over the past decade in the United States, mortality of hospitalized HF patients has improved with a 38% decrease for in-hospital mortality, 16.4% decrease for 30-day mortality, and 13% decrease for 1-year mortality (Krumholz, Normand, & Wang, 2014; Ziaeian & Fonarow, 2016). Add summary and synthesis throughout the paragraph to balance out the use of information from the literature with your own analysis

Risk Factors

When considering risk factors of HF, symptoms of depression may be considered a nontraditional risk factor because clinicians rarely screen patients for depression (Sims et al., 2015). It has been reported that the self-report of depression symptoms is higher among African Americans than Whites and is more severe among African Americans (Sims et al., 2015). There is still no understanding of the racial disparity in depression symptoms among older adults, 65 years and up. Some studies have shown older White adults with higher levels of depression symptoms than Blacks (Sims et al., 2015). Most of the research has examined the association of depression symptoms and CVD outcomes among Whites. The high levels of depressive symptoms among African Americans may result from earning of low income, psychological stress, residing in segregated neighborhoods with limited access to quality mental health care (Sims et al., 2015). Each of these factors is more prevalent among African Americans than their White counterparts and is very vital to explaining the role symptoms of depression play among cardiovascular diseases (Sims et al., 2015).

Social Support

When looking at the relationship of social support to physical and depressive symptoms and the HRQoL among individuals with HF, Heo et al (2014) conducted a cross-sectional study to examine this relationship. It was found that social support was important when engaging patients in self-care to prevent and manage symptoms, reduce symptoms of depression, and maintain a HRQoL (Heo et al., 2014). Particularly, emotional support was significantly related to physical symptoms and symptoms of depression. Additionally, there was an association between marital status and physical symptoms, which was consistent with previous research findings (Heo et al., 2014). One study, conducted in 2004 found that not living with family and having a poor emotional support were significantly associated with symptoms of depression among those with HF (Yu, Lee, Woo, & Thompson, 2004). The findings of this study suggested that improvements to emotional support may lead to improvements of symptoms of depression (Heo et al., 2014; Yu et al., 2004). Conversely, another study showed that patients with symptoms of depression may have a different perception of emotional support compared to those without symptoms due to their misleading cognition

(Murrough, Iacoviello, Neumeista, Chaney, & Iosifescu, 2011). It could be implied that improvements in emotional support and symptoms of depression may lead to improvements in HRQOL (Heo et al., 2014). There are several types of social support; however, my study focused on marital status and relationships between family and friends.

Marital Status

Earlier research showed patients with HF that had a spouse or lifetime partner had a lower hospital readmission and mortality rate and a higher event free survival (Lu et al., 2016). However, these studies were conducted with a population that was 71-86% White; therefore, Lu et al. (2016) conducted a study to determine the effect of social support in the form of marital status and living arrangement on the readmission to the hospital and mortality for heart failure among African Americans. The findings of this study showed that African Americans with heart failure living alone had higher hospital readmission rates and those married had lower mortality rates (Lu et al., 2016). Consistent with other research, being married and living with family was a protective factor. However, only 25% of this study population was married or had a live-in partner compared to the 51-81% of the studies with White populations (Lu et al., 2016). Additionally, the percentage of African Americans that lived alone in this study was higher than the general population in the United States (Lu et al., 2016).

Similarly, another study examined the impact of single living on mortality among patients with HF and whether the association varied by gender (Mard & Nielsen, 2016). Researchers found that using single living as a proxy for social support did have an association with increased mortality among both men and women with HF (Mard & Nielsen, 2016). Overall, there is consistency with other research findings that poor social support in the form of single-living can cause stress, which leads to a stimulation of the sympathetic nervous system causing further to damage of the arterial wall and the myocardium as well as depression (Mard & Nielsen, 2016; Pelle, Gidron, Szabo, 2008). Add summary and synthesis throughout the paragraph to balance out the use of information from the literature with your own analysis.

Family and Friendships

When looking at self-care and disease management, family members are central in the support of patient self-care and disease management (Moser, Arslanian-Engoren, Biddle, Chung, Dekker, Hammash et al., 2016). Most self-care for HF patients is done at home and many, if not most, patients need support from family members to manage their condition (Moser et al., 2016). When patients do not get the assistance he/she needs, failure to manage self-care often occurs such as: lack of refilling prescriptions, preparing meals, transportation, house-keeping, and/or managing finances (Moser et al., 2016).

Over the last thirty years it has been shown that social support from family and friends can have a beneficial effect on mental health outcomes such as depression (George, 2011; Lincoln, Taylor, Bullard, Chatters, Himle, Woodward et al., 2010; Taylor et al, 2015). Social support helps those that are depressed cope more effectively with personal difficulties and manage emotions (Taylor et al., 2015). For instance, the perceived availability of emotional support from family and/friends can reduce the level of stress regarding life's problems (Taylor et al., 2015). On the other hand, social support can improve emotional functioning by reframing adverse events so that it is less threatening (Taylor et al., 2015). Lastly, social support can provide encouragement to help give a sense of positivity and provide strategies for handling life's problems (Taylor et al., 2015).

To examine the association between social support from family and friends and negative interactions with family on depression and symptoms of depression, Taylor and colleagues conducted a cross-sectional study of African Americans and Black Caribbean's (Taylor et al., 2015). Overall, the results of the study indicated that support from family and friends is associated with less depression, and negative interactions with family is associated with higher odds of depression and symptoms of depression (Taylor et al., 2015). These results were consistent with previous research, which also showed that among African Americans support from friends was associated with lower odds of depression after controlling for family support (Moser et al., 2016; Warren-Findlow, Laditka, Laditka, & Thompson, 2011; Taylor et al., 2015). Likewise, frequent negative interactions also have an association with increased odds of having major depressive disorder and higher levels of symptoms of depression (Taylor et al., 2015). This is consistent with other research findings indicating that negative interactions with family and friends can be a risk factor for depression and symptoms of depression among African Americans (Bertera, 2005; Lincoln, Chatters, & Taylor, 2005; Taylor et al., 2015).

Even though family is an important source of happiness, joy, and support, it's been shown by research that they can also be a source of stress (Taylor et al., 2015). This stress can be marital difficulties, conflict with children, illness, or job loss (Taylor et al., 2015) all of which contributes to HF (Chung, Lennie, Mudd-Martin, Dunbar, Pressler, & Moser, 2016). Longitudinal research examining the relationship between social support, specifically marital status and family/friend relationships and depression among African Americans with HF is needed to determine if there are changes in the relationship.

Coping and Stress

When looking at the cardiovascular impact of stress, the stress response plays a vital role in the interface between the brain, feelings, and biological effects (Chauvet-Gelinier & Bonin, 2017). Researchers have stated stress is life; therefore, the brain and body must constantly adapt in order to respond to the stimuli (Chauvet-Gelinier & Bonin, 2017). The effect of these stimuli forces the body to respond in a biological, cognitive, or emotional way, which can affect the regulation of blood pressure, resulting in a diagnosis of HF (Chauvet-Gelinier & Bonin, 2017).

Living with HF can be very stressful, especially with increasing symptomatology as HF progresses (Graven, Grant, & Gordon, 2015; Chien-Li & Shun, 2016). Physical characteristics of HF may impact an individual's ability to perform self-care activities requiring the individual to utilize coping resources, such as social support. Having to cope with both the physical and psychological impacts of HF is important with the life-long adaptations and self-care for HF patients (Chien-Li & Shun, 2016). Individuals with HF deal with stress using emotion-focused coping as well as problem-focused coping mechanisms (Chauvet-Gelinier & Bonin, 2017; Chien-Li & Shun, 2016). Coping using emotion generally involves avoidance, denial, withdrawal, while problem-focused coping involves an action such as problem solving or information seeking (Chien-Li & Shun, 2016). Previous research has suggested that individuals with severe symptoms of HF have more difficulty recognizing and responding to the increase in symptoms; resulting in patients relying on social networks for assistance (Graven et al., 2015). Similarly, patients with an increase in symptom frequency are more vulnerable to rely on social networks for assistance. However, there have been some research findings reporting the opposite; with increased symptomatology there's an association with better self-care (Graven et al., 2015). Nevertheless, there haven't been any research examining the association of coping and stress within relationships with spouses, friends, or family among African Americans with HF, indicating the need for this research study.

Depression and Heart Failure

Approximately 14-63% of HF patients have symptoms of depression (Hammash, Hall, Lennie, Heo, Chung, Lee et al., 2012). To improve the physical and mental well-being it is important to identify symptoms of depression in HF patients. Nevertheless, symptoms of depression can go undiagnosed or untreated, indicating that there are several factors that may contribute to the under treatment of depression in HF patients. The most common factor is the lack of assessment of symptoms by clinicians (Hammash et al., 2012). Additionally, the similarity of symptoms of depression and HF makes it particularly challenging for clinicians to diagnosis properly (Hammash et al., 2012).

As noted by Chung et al (2016), symptoms of depression are a common psychological problem for patients with HF. The prevalence of major depression for HF patients range from 14-21% with one in five HF patients experiencing some level of depression (Chung et al., 2016). Patients that are chronically ill with symptoms of depression are three times more likely to not adhere to medication regiments compared to those with no depression (Chung et al., 2016). Furthermore, there is a significant association with poor medication adherence and depression as well as poor diet and physical inactivity (Chung et al., 2016; Hammash et al., 2012).

A meta-analysis conducted in 2006 indicated the prevalence of major depressive disorder was 20% among inpatients and outpatients with HF (Moser, et al., 2016; Rutledge, Reis, Linke, Greenberg, & Mills, 2006). The self-reported prevalence of symptoms of depression increased 30% when depression questionnaires were used (Rutledge et al., 2006), which was higher than what was seen in the US population (Moser et al., 2016). It has been confirmed that levels of depression symptoms are higher among those with HF than it is among those with other heart conditions or healthy older adults (Moser, Dracup, Evangelsita, Zambroski, Lennie, Chung et al., 2010), and depression levels are higher among African Americans (Mentz, Babyak, Bettner, Fleg, Keteyian, Swank et al., 2015). Patients that have both HF and depression symptoms mortality risk and re-hospitalization is doubled compared to those without depression symptoms (Freedland, Hesseler, Carney, Steinmeyer, Skala, Davila-Roman et al., 2016; Moser, 2016; Rutledge et al 2006; Song, Moser, Kang, & Lennie, 2015).

Even when there are multiple risk factors for mortality, depression still is a stronger predictor for mortality among those with HF (Moser et al., 2016). In addition to this evidence that depression and morbidity and mortality are linked among patients with

HF, there is an apparent dose-response relationship between depression symptoms and mortality in patients with HF (Moser et al., 2016). Those with mild, moderate, and severe symptoms of depression were 21%, 53%, and 83%, respectively more likely to die than patients without depression (Moser et al., 2016; Rutledge et al., 2006). Symptoms of depression is also associated with worse HRQOL among those with HF (Moser et al., 2016). Although the mechanisms linking depression with poor outcomes among those with HF have been examined, it still not yet defined (Moser et al., 2016).

It is likely depression is associates with poor outcomes in HF by way of pathophysiological and behavioral factors (Moser et al., 2016). Depression in HF patients is associated with pro-inflammatory cytokines expression, activation of the sympathetic nervous system, increase platelet aggregation, and dysrhythmias which worsens HF (Moser et al., 2016). Overall symptoms of depression are often unrecognized in patients with HF (Jimenez, Redwine, Rutledge, Dimsdale, Pung, Ziegler et al., 2012; Moser et al., 2016). There is as many as 40% of that are not recognized as depressed by health care providers (Moser et al., 2016). One study showed patients had symptoms of depression for four years before being treated, and of those that were treated 17% had no improvements, 40% never had an adjustment to treatment dosage, and 62% still had no symptoms (Jimenez et al., 2012). Although previous research has shown an association between depression and HF, there is still a lack of longitudinal research to assess the change in the relationship, if any, overtime which would be done by this study.

Depression Screening

Psychological factors such as depression have been shown by research to have an association with poor outcomes among those with HF, and although current treatment guidelines do not address psychological comorbidities, routine screening is recommended (Daskalopoulou, Georger, Walters, Osborn, Batty, & Stogiannis et al., 2016; Kessing, Denollet, Widdershoven, & Kupper, 2016; Moser et al., 2016). In the 1990s, it was noted that screening for depression symptoms is an important and integral part of health assessments of older adults (Andersen & Malmgren, 1994). Even though the prevalence of depression among adults 65 years of age and older was not different than younger adults, it was still related to decline in overall physical health (Andersen & Malmgren, 1994). Therefore, the United States Preventive Services Task Force (USPSTF) in 2002 made recommendations of routine depression screening to ensure accurate diagnosis and an effective treatment and follow-up (Thombs, Ziegelstein, Roseman, Kloda, & Ioannidis, 2014). Depression screening involves the use of a depression symptom questionnaire that will identify individuals who may have depression but have not been diagnosed by a healthcare professional (Thombs et al., 2014). In addition to screening, the use of these screening questionnaires may be used to track symptom severity or detect a relapse among those already diagnosed (Thombs et al., 2014).

Due to the amount of time and cost to conduct structured interviews, several instruments have been developed to address the need to assess whether an individual has depression when conducting epidemiological studies (Mastrogiannis et al., 2012). However, the most common instruments used among epidemiological studies in the

United States are the Centers for Epidemiologic Studies Depression Scale (CES-D), Beck Depression Inventory (BDI), and the Patient Health Questionnaire (PHQ-2 and PHQ-9). The use of these brief questionnaires provides a starting point for clinicians to have a conversation with patients that may lead to appropriate referrals or treatment (Moser et al., 2016). Each of these questionnaires take approximately five minutes to complete and there has been documentation of their internal consistency, validity, and ability to be used to detect clinically important conditions (Hermann, 1997; Kroenke, Spitzer, & Williams, 2001; Moser et al., 2016; Zigmon & Snaith, 1983).

Centers for Epidemiologic Studies Depression Scale (CES-D).

The CES-D is a 20-item instrument developed to be used in large epidemiologic studies involving the general public (Radloff, 1977). For over 20 years, the CES-D has been used in research to define the presence of depression symptoms (Lewinshohn & Seeley, 1997). Participants of the Jackson Heart Study completed the CES-D at various time points throughout the duration of the study (2000-2012), which has been examined by recent retrospective studies to examine the association between depression symptoms and incident stroke (O'Brien et al., 2015); psychosocial factors and behaviors among African Americans (Sims, Lipford, Patel, Ford, Min, & Wyatt, 2017); and social status, psychosocial, and metabolic risk factors for CVD (Subramanyan, Diez-Roux, Hickson, Sarpong, Sims, Taylor et al., 2012). O'Brien et al (2015) examined the CES-D for all participants completed at baseline and found that 25% of the population reported depressive symptoms. Similarly, Sims et al (2017) used baseline CES-D data and found depressive symptoms to be associated with physical inactivity. As hypothesized, Subramanyam et al (2012) found an association with subjective social status and symptoms of depression among both men and women.

On the other hand, to test whether there is an association between depressive symptoms and CVD mortality, Capistrant and colleagues (2013) used a sample from the Health and Retirement Study of adults 50 years of age and older and their spouses. Researchers defined elevated symptoms of depression by using a modified version of the CES-D (8-item) by examining whether the respondent reported in the last week experiencing 3 or more symptoms such as: feeling depressed, restless sleep, feeling happy, feeling lonely, feeling sad, could not get going, everything was an effort (Capistrant, Gilsanz, Moon, Kosheleva, Patton, & Glymour, 2013). The study found that elevated symptoms of depression was associated with an increased hazard of CVD mortality for both blacks and whites after controlling for age and sex, concluding that there was no difference by race (Capistrant et al., 2013).

Beck Depression Inventory (BDI)

BDI is a 21-item questionnaire to assess symptoms of depression. It was developed to parallel with the criteria set forth by the American Psychiatric Association (APA) for diagnosing depressive disorders (Chung et al., 2016). Each item is rated 0-3 and the sum of the ratings is used for the total score, which ranges from 0-63 (Chung et al., 2016). Symptoms of depression are specified with higher scores, particularly scores of 14 or higher meaning the patient has clinically significant symptoms. Although this instrument is valid, it is relatively long and complex and requires an administrative fee (Hammash et al., 2012). Most recent Chung et al (2016) used this questionnaire to examine caregiver outcomes among those taking care of depressed HF relatives. The BDI-II was completed by the HF patients and the results showed that 27% of the participants scored 14 or above, indicating symptoms of depression with 16% reporting use of anti-depressants (Chung et al., 2016).

Patient Health Questionnaire (PHQ-2 and PHQ-9)

This instrument was designed to be used to screen for depression as well as measure symptoms of severity at baseline and follow-ups (Lowe, Blankenberg, Wegscheider, Konig, Walter, Murray et al., 2017). The Science Advisory Board for the American Heart Association recommends the use of the PHQ-2, which consists of two questions to identify individuals that is currently depressed. If subjects respond “yes” to one or both of the questions, the PHQ-9 should be administered (Lowe et al., 2017). Research has shown that there is no difference between the uses of these two instruments, but most importantly, they predict mortality and hospitalizations among HF patients similarly (Lowe et al., 2017). The scoring for the PHQ-9 is categorizes the level of depression symptom as ≥0 (minimal), ≥5 (mild), ≥10 (moderate), and ≥15 (severe) (Lowe et al., 2017).

Although PHQ-9 is widely used, it was not until 2012 when the reliability and validity was assessed to measure symptoms of depression among those with HF (Hammash, Hall, Lennie, Heo, Chung, Lee et al., 2012). Researchers did their assessment using the BDI-II as a gold standard. Data was obtained from two HF studies, a longitudinal study linking depression symptoms with health outcomes and a randomized controlled clinical trial examining the effect of biobehavioral intervention on health outcomes (Hammash et al., 2012). Both of these studies used the PHQ-9 and BDI-II to measure depressive symptoms. The results of this study were consistent with previous research in that stroke patients reported high level of symptoms of depression than those who had not had a stroke (Hammash et al., 2012). However, researchers did not find an association between history of heart attack, diabetes, high blood pressure, and level of depression symptoms (Hammash et al., 2012). As hypothesized, this study confirmed the PHQ-9 is a valid instrument to measure depressive symptoms in patients with HF; there was a strong correlation between the BDI-II and PHQ-9 (Hammash et al., 2012).

In spite of there being a number of depression screening tools that have been developed and used to measure depression in both a clinical setting as well as research, depression is still a leading cause of disability for individuals’ ages 15-44 years which results in approximately 400 million disability days per year (Greenberg et al., 2015), and is a contributing factor to increased risk of cardiovascular diseases, with a 1.5-time increased risk on average and a two to three-time increased risk among those with heart disease (Baune et al., 2012). There is still little research that have been conducted among African Americans regarding the role social support plays in symptoms of depression among those with HF, as well as, the inconsistent findings regarding the number of social network members or marital status and depression among those with HF, which further illustrates the need for this research study.

Conceptual Framework

When assessing the concept of social support and depression symptoms among HF patients, having a poor social support system and symptoms of depression have an effect on the morbidity and mortality (Chung, Lennie, Dekker, Wu, & Moser, 2011; Chung et al., 2013). Researchers compared event-free survival in HF patients who had symptoms of depression with low perceived social support, symptoms of depression with high perceived social support, no depression with low perceived social support, and no depression with high perceived social support (Chung et al., 2011). It was found that patients with symptoms of depression and low perceived social support have the shortest event-free survival and have a two-time greater risk of events (Chung et al., 2011). Additionally, HF patients with symptoms of depression and low social support had a 73% greater risk of hospitalization and death (Chung et al., 2011). Social support from family and friends is an independent predictor of event-free survival, indicating that those without a social support have a 50% greater risk of hospitalization and death (Chung et al., 2011).

The concept of social support has yielded inconsistent findings between patients with HF and those with an acute myocardial infarction. It is believed that the difference is relevant to the acute or the chronic condition (Chung et al., 2011). A myocardial infarction can be a life-threatening event; however, the event is often acute and short-term, whereas HF is a chronic condition that requires long-term social support (Chung et al., 2011). Due to the chronicity of HF, the social support must be strong and involves a long-term commitment from a caregiver, which can cause a severe burden (Chung et al., 2011). Therefore, as the caregiver's burden increases the quality of the social support decreases.

Several models have been developed to explore the relationship between social support and depressive symptoms among individuals with HF. However, each of the models focus on a different characteristic of the relationship. Some of the models have proven to not be appropriate for this proposed research study due to the manner, in which the relationship between social support and depressive symptoms among those with HF were conceptualized. For instance, the Caregiver Model had previously been used for stroke caregiving; however, it was needed to provide guidance to research regarding caring of HF patients in order to determine the important areas for intervention development (Bakas et al., 2006). Due to its purpose to describe caregiving in the context of HF, this model will not be used for this study.

The conceptual framework that has been identified to be closely aligned with this study is the Wilson and Cleary revised conceptual model (Figure 2). Heo and colleagues used this model to examine types of social support and their relationship to physical and depressive symptoms and health-related quality of life in patients with HF (Heo et al., 2014). The Wilson and Cleary model suggests that there may be a relation between social support, physical and depressive symptoms, and HRQOL. For example, there is an association with social support and medication adherence and a low sodium diet (Heo et al., 2014). Additionally, there is an association with symptoms of depression and social support among HF patients (Heo et al., 2014).

Researchers conducted a cross-sectional study to examine this relationship among a sample of HF patients, assuming based off of previous research that there was an association between social support and quality of life through the effects of depression and physical symptoms (Heo et al., 2014). Depression symptoms were measured using the PHQ-9 to assess the frequency of symptoms over the last two weeks and social support was categorized as marital status, social networks, emotional and instrumental support, and relationships with providers and family (Heo et al., 2014).

The results of this study showed that of all the types of social support, marital status and emotional support were related to physical symptoms (Heo et al., 2014). Individuals with HF that were in some type of relationship (married, cohabitant) had greater emotional support and less severe physical symptoms. Contrarily, social networks, relationship with providers and family and instrumental support did not have an association with physical symptoms. On the other hand, when looking at symptoms of depression, emotional support was the only type of social support that showed a relationship (Heo et al., 2014). This relationship shows the importance of educating family and friends regarding HF and providing support group opportunities to aid in the care of relatives with HF is vital for care.

Overall, when accessing the constructs of the Wilson and Cleary revised model, it shows that social support is essential for engaging self-care, preventing and managing symptoms, and reducing symptoms of depression (Heo et al., 2014). This study showed a relationship between social support and symptoms of depression. However, this study was done with a majority White population, in which the relationship could be different among Africans Americans with HF. Therefore, this indicate the need for my study to examine these relationships among a cohort of African Americans.

Jackson Heart Study Review

The Jackson Heart Study (JHS) is appropriate to study the association between social support and symptoms of depression among African Americans with HF. To date, the JHS is the largest single-site prospective study of CVD among African Americans (Taylor, 2003). The project was funded by the National Heart, Lung, and Blood Institute and the National Center for Minority Health and Health Disparities to investigate the factors that influence the development of cardiovascular diseases among African American men and women (Jackson Heart Study, 2016). African American men in Mississippi age 45-54 years have 3.5 greater risk of CVD mortality than their White counterparts, and African American women of the same age have a 4.2 greater risk (Taylor, 2003). This evidence along with the underrepresentation of African Americans in research for major diseases in which African Americans have higher prevalence indicate there is a need for future research. The disproportionate burden of CVD among African Americans can be improved with studies like the proposed study using the JHS (Fuqua, Wyatt, Andrew, Sarpong, Henderson, Cunningham et al., 2005).

The JHS was an extension of the Arthrosclerosis Risk in Community (ARIC) study with 5,302 African American participants for long-term observation of risk factors for CVD (Fuqua et al., 2005). The study enrolled adults 35-84 years of age, including family members 21-34 years of age, participants from the ARIC study, and individuals that volunteered from three counties in Jackson, MS: Hinds, Madison, and Rankin (Fuqua et al., 2005).

Participants in the JHS completed examinations at three different time points: Exam 1 (2004), Exam 2(2005-2008), and Exam 3 (2009-2012). The data collection from these three visits included medical history, medication use, reproductive history, CVD symptoms, anthropometry, blood pressure, CVD evaluations, blood and urine analysis, coping/spirituality, negative emotions, racism and discrimination, access to health care, socioeconomic status, and stress (Taylor, Wilson, Jones, Sarpong, Srinivasan, Garrison et al., 2005). Additionally, subjects completed annual follow-up which included: telephone interviews, clinical examinations, repeated collection of baseline measures, and medical record abstraction for CVD event reporting, death records, CT exams, and MRIs (Taylor et al., 2005). The all-encompassing data that was collected for the JHS expands the opportunity to provide evidence that will show whether or not social support contributes to depressive symptoms among African Americans with HF.

Jackson Heart Study Findings

As of 2018, there have been few studies conducted exploring psychosocial factors and risks of CVD among participants of the JHS. O’Brien et al (2015) examined the association between depressive symptoms and incident stroke and coronary heart disease (CHD) among participants of the Jackson Heart Study (JHS). Researchers hypothesized that depressive symptoms at baseline have a positive association with adverse cardiovascular outcomes (O'Brien et al., 2015). Researchers included all JHS participants that completed at least 16 of the 20 Center for Epidemiological Studies Depression (CES-D) questions at baseline. Depression was categorized as major depressive if participants scored greater than 21 and minor depressive if scored 16 to <21 (O'Brien et al., 2015). Participants were stratified into two cohorts: stroke and CHD. After excluding participants with previous stroke and CHD as well as incomplete CES-D data, researchers found that the participants reporting symptoms of depression were younger, and most likely women (O'Brien et al., 2015). Additionally, the participants most likely had a history of CVD, diabetes, HF, heart attack, physically inactive, and current smoker (O'Brien et al. 2016). The BMI and waist circumference of these participants were higher compared to those without depressive symptoms (O'Brien et al., 2016). On the other hand, participants that did not report symptoms of depression had lower educational level.

When looking at both cohorts, the participants with depressive symptoms had higher cumulative incidence of stroke (3.7%) than those without symptoms (O'Brien et al., 2016). Researchers stratified the participant's symptoms into major or minor depression and found that participants with major depressive symptoms had a higher stroke incidence (5.4%). Similarly, the incidence of CHD among those with depressive symptoms was 5.6% compared to 3.6% for those without symptoms (O'Brien et al., 2016). Again, when stratifying the participants into major and minor depressive symptoms, those with major depressive symptoms had the highest incidence of stroke (5.8%) and those with minor symptoms were closely following with 5.3%, and no symptoms (3.6%) (O’Brien et al., 2016). This study showed that a quarter of the study population had depressive symptoms and after adjusting for baseline risks, confounders, and mediators, there was a 2-fold increase of incident stroke risk among those with major depressive symptoms (O’Brien et al., 2016).

On the other hand, Sims et al (2017) examined multiple psychosocial factors, including depression which could be mediators for the association between psychosocial measures and cardiovascular outcomes. Studies have shown that African Americans cope with stressful events by engaging in behaviors that are unhealthy such as: poor diet, physical inactivity, and smoking (Sims et al., 2017). Researchers found that women reported higher levels of symptoms of depression compared to men, and the symptoms were associated with physical inactivity (Sims et al., 2017).

Both of these studies build on the results of previous research but with a larger sample of African Americans and more detailed information regarding the risk factors of CVD (O’Brien et al., 2016; Sims et al., 2017). However, it is evident from O’Brien et al (2016) that there is an increased risk among those with major depressive symptoms. Both studies have indicated the need for further understanding of the association between depressive symptoms and outcomes of CVD among African Americans, which leads to the purpose of this research study.

Gaps with the Jackson Heart Study

The data for JHS provides an insight with the relationship of psychosocial factors and risks of CVD, and depressive symptoms and incident stroke. However, the lack of data regarding the relationship between social support and depressive symptoms among participants of JHS with HF indicates a need to investigate the relationship between social support and depressive symptoms among those with HF. O'Brien et al (2015) recommended future work characterize the burden of depression overtime and the risk of adverse CVD events among African Americans. Also, the JHS have not examined the association between social support and depressive symptoms among those with HF across all three of the examination periods in which data was collected.

Conclusion

The purpose of this study is to determine whether or not social support contributes to depressive symptoms among African Americans with HF in the Jackson Heart Study. The previous research discussed in this chapter have provided understanding on how social support is associated with improved quality of life, better medication adherence, decrease in hospital readmission, and higher expertise in HF. Additionally, the previous research discussed have shown there is lack of information regarding the relationship between social support and depressive symptoms among African Americans with HF; therefore, future research is needed to assess this relationship. This study will enhance research on the relationship of social support and depressive symptoms among African Americans participating in the Jackson Heart Study. Chapter 3 will identify the research questions for this study and identify the methods that will be used to address the gaps in research. The findings of this study will contribute to the overall understanding of the relationships of social support and depressive symptoms among those with HF.

Chapter 3: Research Method

Introduction

The purpose of this quantitative research study was to determine whether social support contributes to depressive symptoms among African Americans with HF in the JHS. Particularly, I examined the experience of different types of social support, its relationship to depressive symptoms, and its relationship to the change in depressive symptoms overtime among participants with HF.

This study used a cohort study design to analyze secondary data from the JHS Exam 1 (2000-2004) and Exam 3 (2009-2013) periods to examine the type of social support effect on depressive symptoms among those with HF (JHS, 2016). The JHS contains data that was used to measure social support regarding participant's relationships with family and friends, depressive symptoms, and HF. To understand this pathway, I examined the relationship between the type of social support (marital status, family/friend relationships, social network, and emotional support) and symptoms of depression; examined how the type of social support predicts depressive symptoms; and examined the association of social support to the change in depressive symptoms among HF subjects over time.

This chapter will discuss the methodology that was used to conduct this study. First, I will identify the research questions for this study that will be answered. The chapter will then discuss the research design, study population, instruments that was used, study variables, and the data analysis plan that was used for each of the research questions. Lastly, the chapter will conclude with a discussion of any concerns of the methodology that was used and any potential threats to validity.

Research Design and Rationale

This study is a quantitative cohort analysis of secondary data collected during the JHS Exam 1 (2000-2004) and Exam 3 (2009-2013) periods to examine the pathway of social support effect on depressive symptoms among those with HF. To do this, the types of social support reported by participants were examined to understand the relationship between social support and self-reported symptoms of depression.

Research Questions

The research questions for this study examined the relationship between social support and depressive symptoms among patients with HF. Hypotheses were identified to test each of the research questions.

RQ1: What is the relationship between social support as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1?

> H_a1_1: There will be an association between marital status as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.
>
> H_01_1: There will not be an association between marital status as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_a1_2: There will be an association between family/friend relationships as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_01_2: There will not be an association between family/friend relationships as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_a1_3: There will be an association between social networks as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_01_3: There will not be an association between social networks as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_a1_4: There will be an association between emotional support as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_01_4: There will not be an association between emotional support as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

RQ2: To what extent does social support as measured by the Social Support Form predict depressive symptoms as measured by the Major Depressive Episode Form (MDEA) among JHS participants with HF during Exam 3?

H_a2_1: There will be associations between marital status as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_1: There will not be associations between marital status as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_a2_2: There will be associations between family/friend relationships as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_2: There will not be associations between family/friend relationships as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_a2_3: There will be associations between social networks as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_3: There will not be associations between social networks as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_a2_4: There will be associations between emotional support as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_4: There will not be associations between emotional support as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

RQ3: What is the association between social support and the change in depressive symptoms from Exam 1 as measured by the CES-D depression scale and Exam 3 as measured by the MDEA among JHS participants with HF?

H_a3_1: There will be an association between marital status as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_03_1: There will not be an association between marital status as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_a3_2: There will be an association between family/friend relationships as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_03_2: There will not be an association between family/friend relationships as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_a3_3: There will be an association between social networks as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_03_3: There will not be an association between social networks as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_a3_4: There will be an association between emotional support as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_03_4: There will not be an association between emotional support as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

The Independent Variables were marital status (1 categorical, 1 dichotomous, and 1 interval variables), family/friend relationship (3 categorical variables), social networks (2 categorical variables), emotional support (2 categorical variables). The Dependent Variable were self-reported depressive symptoms (1 categorical variable). The covariates were age, gender, education, income, coping, and stress. A logistic regression was used to test for all RQs.

Methodology

Even though there are several methods that may be used to recruit participants for a research study, the researchers for the JHS chose techniques that would address the issues of African Americans, such as lack of trust in research from previous abuse and lack of study participation (Fuqua et al., 2005). Due to these barriers, the JHS researchers recognized these created issues for recruitment and retention of African Americans to participate in the Jackson cohort of the ARIC study (Fuqua et al., 2005; Sims, Wyatt, Gutierrez, Taylor, & Williams, 2009; Wyatt et al., 2003). Subsequently, the study population used for the JHS was developed based on lessons learned from previous research that was conducted in Jackson, MS (Fuqua et al., 2005; Sims et al., 2009).

The JHS Participant Recruitment and Retention Survey (PPRS) was used initially to determine factors that encouraged or subdued participation in the ARIC study (Wyatt et al., 2003). The PPRS was a pilot to identify strategies that were effective to engage African Americans in ongoing research study participation (Wyatt et al., 2003). The specific aims of this pilot were to

1. Define factors that encourage or subdue study participation among participants in the Jackson ARIC cohort
2. Define similar factors that heightened or hinder participation, especially for those that were younger and older.
3. Define the experience of participation, which may influence or abstain from participating in research studies.

As a result of the PPRS pilot, there were both qualitative and quantitative findings that were appropriate and specific to the community, which then became the basis for the community-driven model that was used for recruitment and retention for the JHS (Fuqua et al., 2005; Wyatt et al., 2003).

Even though there is similarity between the Framingham Heart Study and the JHS, the difference between the two studies is the JHS focus on African Americans and the use of the community-driven model (Wyatt et al., 2003). According to Wyatt et al (2003), a community-driven model offers the possibility of endorsing an approach that respects both the researcher and the participant. Having this thought process requires a shift in the researcher's perspective that incorporates the viewpoint of the participant because participants have knowledge that is relevant not only for themselves but for the study (Wyatt et al., 2003). Overall, this model and the PRRS placed the members of the Jackson community in a position to be a part of the process when developing the study protocol for the JHS, served as coinvestigators, and helped with the study findings dissemination (Wyatt et al., 2003). Thus, the recruitment for the JHS was based on a community participatory approach which showed respect for the Jackson community and have been used for many years (Wyatt et al., 2003).

Sampling Procedures

For the JHS, four sampling frames were used for recruitment. The first was a sample of participants from the ARIC study totaling 3,371 participants ages 57-76 years of age (Fuqua et al., 2005). Due to death of study participants, there were 3,027 eligible for the study. The second sample of participants was a random sample from the community using the Accudata list, which provides a list of households with individuals 35 years of age (*n*=123,403). Those living in areas with less than 30% African Americans were removed from the list. The third sample of participants were volunteers from the community who met the census-derived age, sex, and SES criteria for Jackson metropolitan statistical area (MSA; Fuqua et al., 2005). The last sample of participants consisted of family members of participants from the other three sampling frames who were at least two full siblings and four first degree relatives that lived in the Jackson MSA, 21 years of age, and willing to participate in the study (Fuqua et al., 2005). This recruitment phase of the JHS was considered Exam 1 which took place during 2000-2004. Annually, there was a follow-up conducted until the end of the study, with the intent of retaining 85% of the cohort for Exam 2 (2005-2008) and Exam 3 (2009-2013) (Jackson Heart Study, 2018). By Exam 3, the cohort consisted of volunteers (*n*=1,018), family (*n*=842), random sample (*n*=653), and ARIC (*n*=1,306; JHS, 2018).

Study Population

To be eligible for the JHS, participants had to be African American, residing in the tricounty area of Jackson, MS (Hinds, Madison, &Rankin, year), noninstitutionalized, and between the ages of 35 to 84 years as of September 1, 2000 (*n*=76,420; Fuqua et al., 2005). Additionally, demographics such as age, sex, and SES were matched to the geographic population to identify a representative sample (Fuqua et al., 2005). Although the majority of the study participants were ages 35 to 84 years and had middle to high SES, the researchers included pregnant women in the third trimester, women less than 3 months postpartum, individuals with language problems with an interpreter, and those living outside the tricounty area temporarily during recruitment (Fuqua et al., 2005; JHS, 2001). Furthermore, the exclusion criteria included those that lived outside the tricounty area, identified as physically or mentally incapable, and those indicating relocation within the year of the study initiation (Fuqua et al., 2005). For this study, there were additional exclusions. Study participants that have incomplete or missing demographic, depression, HF, or social support data were excluded from the analysis.

Sample Size

During Exam 1 of the JHS, 5,301 participants were examined from 2000-2004 (Fuqua, 2005). However, the original sample size was 6,500, but because the power analysis proved the research questions could be answered with 5,500 participants, the sample size was reduced (Fuqua et al., 2005). The sample consisted of 30.7% ARIC participants (n=1,626), 17.4% random sample (n=921), 29.6% volunteers (n=1,570), and 22.4% family members (n=1,185) (Fuqua et al., 2005). For this, the whole sample was used from the JHS for analysis. As mentioned, participants were excluded if demographics, depression, HF, and social support data were missing or incomplete. Even though an existing sample was used for this study, an additional power analysis was done to confirm there was an adequate sample size to answer the research questions.

A power analysis was conducted using G*Power to determine if the sample of participants from the JHS will be sufficient for this study. To do the power analysis, a multiple regression design using all of the variables was chosen for power based on the sample size that is known for the JHS and a two-tailed t-test with alpha 0.05. The G*Power calculation showed that a sample size of (n=1446) was needed for this study, which will have a sufficient statistical power to detect a correlation of social support and depression among those with HF.

Study Instrument

For this study, secondary data collected using several JHS data collection instruments was analyzed. First, to assess depression, the researchers of the JHS used the 20-item Center for Epidemiologic Studies (CES-D) scale to measure depressive symptoms (O'Brien et al., 2015; Sims et al., 2017; Subramanyam et al., 2012). This instrument was developed to be used in large epidemiologic studies that involve the general public and have been shown to have psychometric properties among African Americans (O'Brien et al., 2015). During the JHS, this instrument was part of the take-home packet that was given to participants at the end of their baseline clinical visit and mailed back to the research site (Subramanyam et al., 2012). The participants were asked about his/her mood over the past week, providing response of 0 (rarely or none of the time) to 3 (most or all of the time) to items such as "I was bothered by things that usually don't bother me" (Sims et al., 2017). The scores were summed with the highest indicating greater frequency of symptoms of depression (Sims et al., 2017; Subramanyam et al., 2012). On the other hand, during O'Brien's study, researchers classified participants into major or minor depressive symptomatology using cut points of score 16 to 21 as minor and score of greater than or equal to 21 as major. These cut points were used for this study because they have been used in previous research that have conducted a secondary analysis of JHS data (O'Brien et al., 2015).

Secondly, during Exam 3 period, participants completed the Major Depressive Episode Form (MDE) to report depressed mood. The JHS researchers decided to use a different instrument during Exam 3 because having a direct examination of whether a participant had major depressive episodes would add value to the relationship between the onset of physical disease and depression (Jackson Heart Study, 2010). This instrument was administered by a certified interviewer, and gathered data on the occurrence, duration, severity, and recurrence of depressive episodes (Jackson Heart Study, 2010). Unlike, the CES-D, the MDE is not a scored survey; however, if subject answered "yes" to five or more of the first set of questions, it was indicated the subject has current major depressive episode (Jackson Heart Study, 2010).

The third JHS data collection form that was used for this study is the Social Support Form. This instrument was administered during the Exam 1 (2000-2004) Home Induction Interview to collect data regarding support from close person relationships (i.e. family, friends, and social networks). The purpose of this instrument was to ascertain marital status, extent of positive and negative social support received, community involvement, and to determine the number of close relatives. The response categories used for marital status (i.e. divorced, married, never married, separated, widowed), positive and negative social support (i.e. great deal, quite a bit, a little, not at all), and the number of relatives and friends was not changed for this study. For community involvement, participants were asked whether he/she belonged to a church or social group and the number of groups he/she is involved with.

The fourth instrument used was the Stress Form (STSA), which was included in the Home Induction interview to collect data about the degree of stress the participant perceived in several areas of life over the past year. This is an 8-item questionnaire; however, the question of interest for this study was question #2 asking “Over the last 12 months, how much stress did you experience in your relationships with others? (i.e. marriage, friendships, dealing with relatives)”, with responses of not stressful, mildly stressful, moderately stressful, or very stressful (Jackson Heart Study, 2010). The fifth instrument used was the Coping Strategies Inventory Form (CSIA), which was developed to categorize coping responses, and was used for the JHS because in spite of the number of stressors African Americans are exposed to, little was known about the pattern of coping among African Americans (Addison, Campbell-Jenkins, Sarpong, Kibler, Singh, Dubbert et al., 2007). This is a 16-item instrument; however, the question of interest is question #6, asking how the participant typically handle or cope with stress as “I try to talk about it with a friend or family”, with responses of never, seldom, sometimes, often, or almost always (Jackson Heart Study, 2010).

Study Variables

Demographic Variables

The following demographic variables will be taken from the JHS Eligibility Form (Appendix A):

- Study ID Number- an identifier given to participants that was used on all data collection forms

- Date of Interview- the date when the participant interview was conducted. this is a numeric variable that has a two-digit month and day, and a four-digit year.
- Age- a numeric value using the participant's two-digit month and day, and four-digit year date of birth and two-digit month and day, and four-digit date of interview to calculate age. For this study, age will be categorized using the same categories from the JHS and previous research of 35-44, 45-54, 55-64, 65-74, and 75-84 years (Jones-Jack, 2016).
- Gender- self-reported by participants as a dichotomous variable "Female" or "Male".

Socioeconomic Variables

- Education- For this study, education was categorized using the same categories as Sims et al (2017) as less than high school, high school graduate to some college, and college graduate and above.
- Income Status-For this study, income status will be categorized as less poor, lower-middle, upper-middle, and affluent.

Stress Variable

For this study, stress was measured using the Stress Form question #2, which asked about the amount of stress experienced over the past 12 months. "Over the past12 months, how much stress did you experience in your relationships with others? (i.e. marriage, friendships, dealing with relatives) (Appendix B). Table 1 describes the variable, variable type, and category.

Table 1

Stress Variable

Variable Name	Variable Label	Variable Type	Frequency Category
STSA2	In your relationships with others (i.e. marriage, friendships, dealing with relatives)	Categorical	A-Not Stressful B-Mildly Stressful C-Moderately Stressful D-Very Stressful

Coping Variable

For this study, coping was measured using the CSIA form question #6, which asked typically how the participant handle or cope with stress. “I try to talk about it with a friend or family” (Appendix C). Table 2 describes the variable, variable type, and category.

Table 2

Coping Variable

Variable Name	Variable Label	Variable Type	Frequency Category
CSIA6	I try to talk about it with a friend or family	Categorical	1-Never 2-Seldom 3-Sometimes 4-Often 5-Almost Always

Social Support Variables

For this study, social support was measured using the Social Support Form (Appendix D). Table 3 describes the variable, variable type, and category. There are three skip patterns within this questionnaire that will result in a subset of answers for variables SOCA1A, SOCA2, and SOCA8A.

Table 3

Social Support Variables

Variable Name	Variable Label	Variable Type	Frequency Category
SOCA1A	Married/Single/Divorced/Widowed	Categorical	1-Divorced 2-Married 3-Never Married 4-Separated 5- Widowed
SOCA1B	How long (year)	Number	
SOCA2	Currently living with spouse/another person in relationship	Dichotomous	0-No 1-Yes
SOCA3	How much (he/she) makes you feel cared for?	Categorical	1-a great deal 2-quite a bit 3-some 4-A little 5-Not at all
SOCA4	How much (he/she) makes too many demands on you?	Categorical	1-a great deal 2-quite a bit

(*table continues*)

Variable Name	Variable Label	Variable Type	Frequency Category
			3-some 4-A little 5-Not at all
SOCA5	How many close friends can you talk to?	Categorical	1-None 2-1 or 2 3- 3 to 5 4- 6 to 9 6- 10 or more
SOCA6	How many relatives are you close to?	Categorical	1-None 2-1 or 2 3- 3 to 5 4- 6 to 9 6- 10 or more
SOCA7	Number of friends/relatives you see once per month?	Categorical	1-None 2-1 or 2 3- 3 to 5 4- 6 to 9 6- 10 or more
SOCA8A	Do you belong to social/church group?	Dichotomous	0-No 1-Yes
SOCA8B	Total number of groups you belong to?	Number	

Depression Variables

During the JHS, data regarding depression symptoms were collected during Exam 1 (2000-2004) using the CES-D (Appendix E) and Exam 3 (2009-2013) using the Major

Depressive Episode Form (Appendix F). Therefore, for this study, self-report of depression symptoms was measured using the CES-D from Exam 1 and the Major Depressive Episode Form from Exam 3. Although two different instruments were used, the MDEA was derived from the DSM-V criteria and the CES-D was developed using these criteria; both have been validated to be used to diagnosis depression. The responses for both of these assessments were not combined for this study; however, the CES-D was be categorized as done by O'Brien et al (2015) with minor depressive symptomology being a score of 16 to less than 21 and major depressive symptomology being score greater than or equal to 21. Study participants with depression scores less than 16 was categorized as no depressive symptomology. Table 2 describes the variable, variable type, and category for the CES-D. The total scores for the CES-D range from 0-60 with higher scores indicating there is greater frequency of symptoms of depression (Jackson Heart Study, 2001). The score was computed as a sum of the items, with items scored from 0 to 3 (0= rarely, 3=most). Also, items 4,8,12, and 16 are reverse-scored (3=rarely, 0=most) (Jackson Heart Study, 2001). Table 4 describes the variable, variable type, and category for the Major Depressive Episode Form. During the administration of this survey, if the participant answered "yes" to five or more questions from sections A1-A3 (variables MDEA1-MDEA3G), the subject was diagnosed with having a major depressive episode.

To measure the change in depression, a new variable "depression change" was be created for this study. This new variable was measured using the participant's CES-D score (minor depressive symptomology vs major depressive symptomology) and if the response for variable MDEAH is “yes” from the MDEA survey. The five categories for this variable are: No change, no depressive symptomology to major depressive episode, minor depressive symptomology to major depressive episode, major depressive symptomology to no major depressive episode, and minor depressive symptomology to no major depressive episode.

Table 4

CES-D Variables

Variable Name	Variable Label	Variable Type	Frequency Category
CESA1	Bothered by things that don’t bother me	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA2	Not feel like eating/poor appetite	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)

(*table continues*)

Variable Name	Variable Label	Variable Type	Frequency Category
CESA3	Could not shake off the blues	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA4	Felt I was just as good as other people	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA5	Trouble keeping my mind on tasks	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA6	I felt depressed	Number	1-Rarely or None of the time (<1 day)

(*table continues*)

Variable Name	Variable Label	Variable Type	Frequency Category
			2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA7	Felt that everything I did was an effort	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA8	Felt hopeful about the future	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA9	Thought my life had been a failure	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days)

(*table continues*)

Variable Name	Variable Label	Variable Type	Frequency Category
			3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA10	Felt fearful	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA11	My sleep was restless	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA12	I was happy	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days)

(*table continues*)

Variable Name	Variable Label	Variable Type	Frequency Category
			4-Most or all of the time (5-7 days)
CESA13	I talked less than usual	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA14	I felt lonely	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA15	People were unfriendly	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)

(*table continues*)

Variable Name	Variable Label	Variable Type	Frequency Category
CESA16	I enjoyed life	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA17	I had crying spells	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA18	I felt sad	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA19	I felt people disliked me	Number	1-Rarely or None of the time (<1 day)

(*table continues*)

Variable Name	Variable Label	Variable Type	Frequency Category
			2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)
CESA20	I could not get going	Number	1-Rarely or None of the time (<1 day) 2-Some or Little of the time (1-2 days) 3-Occasionally or a Moderate Amount of the time (3-4 days) 4-Most or all of the time (5-7 days)

Table 5

Major Depressive Episode Variables

Variable Name	Variable Label	Variable Type	Frequency Category
MDEA1	Have you been consistently depressed or down, most of the day, nearly every day, for the past 2 weeks?	Dichotomous	1-Yes 2- No
MDEA2	In the past 2 weeks, have you been much less interested in most things able to enjoy things you used to enjoy most of the time?	Dichotomous	1-Yes 2- No

(*table continues*)

Variable Name	Variable Label	Variable Type	Frequency Category
MDEA3A	Was your appetite decreased or increased nearly every day? Did your weight decrease or increase without trying intentionally?	Dichotomous	1-Yes 2- No
MDEA3B	Did you have trouble sleeping nearly every night?	Dichotomous	1-Yes 2- No
MDEA3C	Did you talk or more slowly than normal or were you fidgety, restless or having trouble sitting still almost every day?	Dichotomous	1-Yes 2- No
MDEA3D	Did you feel tired or without energy almost every day?	Dichotomous	1-Yes 2- No
MDEA3E	Did you feel worthless or guilty almost every day	Dichotomous	1-Yes 2- No
MDEA3F	Did you have difficulty concentrating or making decisions almost every day?	Dichotomous	1-Yes 2- No
MDEA3G	Did you repeatedly consider hurting yourself, feel suicidal, or wish that you are dead?	Dichotomous	1-Yes 2- No
MDEAH	Are 5 or more answers coded yes?	Dichotomous	1-Yes 2- No

(*table continues*)

Variable Name	Variable Label	Variable Type	Frequency Category
MDEA4	During your lifetime, did you have other periods of two weeks or more you felt depressed or uninterested in most things, and had most of the problems we just talked about?	Dichotomous	1-Yes 2- No
MDEA5	Did you ever have an interval of at least 2 months without any depression and any loss of interest between 2 episodes of depression?	Dichotomous	1-Yes 2- No
MDEA6	Have you felt sad, low or depressed most of the time for the last two years?	Dichotomous	1-Yes 2- No
MDEA6A	Was this period interrupted by your feelings OK for two months or more?	Dichotomous	1-Yes 2- No
MDEA7A	Did your appetite change significantly	Dichotomous	1-Yes 2- No
MDEA7B	Did you have trouble sleeping or sleep excessively?	Dichotomous	1-Yes 2- No
MDEA7C	Did you feel tired or without energy?	Dichotomous	1-Yes 2- No
MDEA7D	Did you lose your self-confidence?	Dichotomous	1-Yes

(*table continues*)

Variable Name	Variable Label	Variable Type	Frequency Category
			2- No
MDEA7E	Did you have trouble concentrating or making decisions?	Dichotomous	1-Yes 2- No
MDEA7F	Did you feel hopeless?	Dichotomous	1-Yes 2- No
MDEA8	Did the symptoms of depression cause you significant distress or impair your ability to function at work?	Dichotomous	1-Yes 2- No
MDEA8A	Are 2 or more answers coded yes?	Dichotomous	1-Yes 2- No

Heart Failure Variable

For this study, HF diagnosis was abstracted from the study participants' medical record during both Exam 1 and Exam 3 by JHS study personnel. HF diagnoses that were abstracted with dates of each exam period (2000-2004 and 2009-2013, respectively) were included in this study.

Data Access

The procedures for researchers to receive access to the JHS data includes the submission of a manuscript proposal to the JHS Publications and Presentations Subcommittee. The proposal was developed and submitted that described the purpose of the study, research questions and hypotheses, variables needed, and the data analysis plan. It was also required that a JHS investigator participate in the development of this manuscript; therefore, for this study one other JHS investigator was included as coauthor along with Walden faculty.

It was a requirement of the subcommittee that all coauthors provide a statement of agreement to support this manuscript proposal prior to the review process. After the approval from the subcommittee, a JHS Data and Material Distribution Agreement must be submitted for approval to obtain access to the data needed. This review process included multiple emails and follow-up to clarify details that were requested of the subcommittee. To protect the identity of the study participants, the de-identified data were received using a password-protected data file.

Data Analysis

The dataset obtained from JHS included the variables that was outlined in the JHS Manuscript Proposal. During the approval of my proposal, the data was cleaned by the JHS research team, and missing data was removed from the dataset before analyses were performed. For this study, SPSS version 25 was used to perform descriptive statistics and multiple regression analysis. For the descriptive statistics, the central tendency, including frequency, standard deviation, mean, and median will be calculated for each of the continuous variables. Additionally, for the categorical variables, contingency tables were produced to calculate a count of each of the combinations of the categorical variables using the R function, as well as, present proportions of each of the combinations (Peat & Barton, 2008).

The regression analyses were conducted to examine the relationship between two or more variables (i.e. social support, social network, family/friend relationships, emotional support, and depressive symptoms) so that one can be predicted from the other or others (Neter, Kutner, Nachtsheim, & Wasserman, 1990). With a regression model, a tendency of the response variable *Y* (social support) varies with the predictor variable *X* (depressive symptoms), and there is a scattering of points around the curve of statistical relationship (Neter et al., 1990). Regression analyses are done to serve three purposes: 1) descriptive 2) control 3) prediction (Neter et al., 1990), and prediction will be shown with the proposed study to determine the association between social support and depressive symptoms among participants with HF.

For RQ1 and RQ2, a multiple logistic regression analysis was done to explain the relationship between social support and depressive symptoms among JHS participants with HF during Exam 1 and Exam 3. This analysis allowed the study to predict the value of social support on depressive symptoms and determine the variance of the model and its contribution to the predictor. This model was used to determine which types of social support (marital status, family/friends, social networks, and emotional support) were significantly related to depressive symptoms, while controlling for age, gender, education, income, coping and stress. To assess which type of social support is related to depressive symptoms, two levels was analyzed in the regression model. The first level used a forward selection to identify the type of social support that is most significant, and the second evaluated the relationship of social support to depressive symptoms. The regression model analyzed the odds of having social support versus not having social support and included variables (marital status, family/friend relationship, social networks, and emotional support) to examine its association with depressive symptoms. For the variables in the regression model, odds ratios and 95% CI were estimated and chi-square tests were performed for categorical variables.

For RQ3, a multivariate logistic regression model was used to determine whether there is an association between social support and the change in depression symptoms from Exam 1 to Exam 3. To assess which type of social support is related to the change in depressive symptoms, two levels was analyzed in the regression model. Similar to the analysis for RQ1 and RQ2, the first level used a forward selection to identify the type of social support that is most significant, and the second evaluated the relationship of social support to the change in depressive symptoms. The regression model analyzed the odds of social support versus no social support to examine its association with changes in depressive symptoms. For the variables in the regression model, odds ratios and 95% CI was estimated and chi-square tests were performed for the new categorical variable, "Depression_Change".

Threat to Validity

Several factors can pose a threat to the validity of the proposed research study. As defined by Gay and Airasian (2000) internal validity is "the condition that observed difference on the dependent variable are a direct result of the independent variable, not some other variable" (p. 345). Potential threats to the internal validity may include selection bias and confounding. Since participants for the JHS were a combination of participants from a previous study, family members, a random sample from the community, and volunteers, the participants may have had a more practical interest in cardiovascular disease that may have cause selection bias (Fuqua et al., 2005; Wyatt et al., 2003). On the other hand, Johnson and Christensen (2000) defines external validity as “the extent to which the results of a study can be generalized to an across populations, settings, and times” (p.200). By this definition, the generalizability of the proposed study may be a potential threat to external validity because the JHS study cohort was drawn from the tri-county area of Jackson, MS.

Ethical Considerations

The data for this study were received and analyzed in agreement with the guidelines provided and signed by the JHS. The de-identified data did not contain any linkages to the participant’s identifying information but included the subject ID number that was assigned during the study to ensure confidentiality. All of the data for this study was saved on my personal password protected computer. There was minimal risk with this study due to the analysis of secondary data. During the JHS, study participants signed an informed consent and was informed the study was voluntary and he/she could withdraw study participation at any time. Therefore, no further contact with study participants was necessary for this study, and these data will not be shared with other researchers. There is one JHS investigator serving as a collaborator for this study, and any publications will be reviewed prior to dissemination. A review and approval from Walden University’s Institutional Review Board (IRB # 10-08-19-0248799) was conducted and received prior to conducting the data analysis of the study.

Summary

This chapter provided information for how this research study was conducted. The research study design, research questions and hypotheses, description of the study population, sampling procedures, instruments used, variables, and the data analysis conducted have been described. Chapter 4 will discuss the results of the data analysis as well as the relationship between social support and depression symptoms among those with HF.

Chapter 4: Results

Introduction

This chapter will present the findings from an analysis conducted using secondary data from the JHS as well as illustrate how the data answer the research questions. First, the changes made to the research plan and rationale are described, along with descriptive data that characterizes the variables from the JHS, such as number of study participants with HF, age groups, gender, and depression scores. Additionally, this chapter includes a description of the statistical analysis results addressing the three research questions, including information regarding the independent and dependent variables, and the covariates that were used for each of the research questions. Lastly, Chapter 4 will conclude with a summary of the study results.

Research Questions

Here is a review of the research questions identified in the previous chapters before describing the data that were analyzed.

RQ1: What is the relationship between social support as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1?

> H_a1_1: There will be an association between marital status as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_01_1: There will not be an association between marital status as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_a1_2: There will be an association between family/friend relationships as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_01_2: There will not be an association between family/friend relationships as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_a1_3: There will be an association between social networks as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_01_3: There will not be an association between social networks as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_a1_4: There will be an association between emotional support as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

H_01_4: There will not be an association between emotional support as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1.

RQ2: To what extent does social support as measured by the Social Support Form predict depressive symptoms as measured by the Major Depressive Episode Form (MDEA) among JHS participants with HF during Exam 3?

H_a2_1: There will be associations between marital status as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_1: There will not be associations between marital status as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_a2_2: There will be associations between family/friend relationships as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_2: There will not be associations between family/friend relationships as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_a2_3: There will be associations between social networks as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_3: There will not be associations between social networks as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_a2_4: There will be associations between emotional support as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

H_02_4: There will not be associations between emotional support as measured by the Social Support Form, and depressive symptoms as measured by the MDEA among JHS participants with HF during Exam 3.

RQ3: What is the association between social support and the change in depressive symptoms from Exam 1 as measured by the CES-D depression scale and Exam 3 as measured by the MDEA among JHS participants with HF?

H_a3_1: There will be an association between marital status as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_03_1: There will not be an association between marital status as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_a3_2: There will be an association between family/friend relationships as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_03_2: There will not be an association between family/friend relationships as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_a3_3: There will be an association between social networks as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_03_3: There will not be an association between social networks as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_a3_4: There will be an association between emotional support as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

H_03_4: There will not be an association between emotional support as measured by the Social Support Form, and the change in depressive symptoms as measured by the CES-D in Exam 1 and Exam 3 as measured by the MDEA among JHS participants with HF.

Data Collection

To obtain access to the secondary data analyzed for this study, I developed and submitted a JHS Manuscript Proposal for approval to the JHS Publications and Presentations Subcommittee. During the subcommittee's review, it was recommended coping and stress be added as covariates for this study; thus, the addition of these two new variables. After approval, I completed and submitted a JHS Data and Material Distribution Agreement for access to the data requested, in which de-identified data was downloaded from a password-protected link provided. Due to the data being sent as individual files, using SPSS, I created a dataset that included all the variables needed for this study. I was also notified after receiving the data that the HF variable was collected from the medical chart abstractions completed during Exam 1 due to the Heart Failure Survey data not being available for use.

After creating the dataset with the needed variables, I used the JHS data codebooks to ensure the variables were in the correct format and added the values and labels for each of the variables. A few variables I recoded as categorical variables, such as the age variable (Age_Cat), number of social networks belonging to (Social Group_Cat), number of years married (Marriage_Cat), and CES-D scores (Depression_Cat) to be consistent with previous research from the JHS (O'Brien et al., 2016; Sims et al., 2017). For this study, SES is measured as income and education, in which the education variable sent was in the categories needed; however, the income data sent was income status categorized as poor, lower-middle, upper-middle, and affluent, instead of the household income. For this study, income status was used as the income indicator.

Descriptive Statistics for Analysis Variables

JHS Exam 1 Participants

The dataset obtained from the JHS contained data for 5,306 participants with 63.5% of the population being female and a mean age of 54 years. Of these, 524 had a diagnosis of HF according to his/her medical chart abstraction between 2000 and 2004, and thus were eligible for inclusion in the study. Of these 524 participants, there were five male participants under the age of 35 years and 232 study participants with missing CES-D scores, leaving 287 study participants for analysis.

Table 6 provides descriptive data on the demographic characteristics of these participants during Exam 1 which consisted of 179 female participants (62.4%) and 108 male participants (37.6%). Most of the participants were distributed between the 55-64 and 65-74 age groups (30.3% and 33.1%, respectively), with a mean age of 62 years. Approximately, 50% of the population had some college education or greater, while 31% had less than high school diploma. Also, majority of the participants were either affluent (21.6%), lower- middle class (23.3%), or upper-middle class (24.7%). Overall, when comparing the demographics of the study participants with HF to the general study population of the JHS (data not shown) there is similarity among the distribution of participant’s age, gender, and education, indicating there is generalizability among this subset of the study population.

Table 6

Frequencies: Demographics of Study Participants with HF during Exam 1 (N=287)

Indicator	n	%
Gender		
Male	108	37.6
Female	**179**	**62.4**
Age Group		
35-44	20	7.0
45-54	42	14.6
55-64	87	30.3
65-74	**95**	**33.1**
75-84	41	14.3
Education Level		
Less than High School	90	31.4
High School or GED	54	18.8
Some college or College Graduate	**143**	**49.8**
Income		
Poor	52	18.1
Lower-Middle	67	23.3
Upper-Middle	**71**	**24.7**
Affluent	62	21.6

Table 7 illustrates data related to participants with HF perceived social support as measured by the SOCA completed during Exam 1. The data show that 59% of the participants reported being married and living with their spouse. Of those married, 47% have been married for less than 25 years. Only those that responded living with spouse or partner (*n*=167) were asked how much his/her spouse make him/her feel loved and cared for, in which 33% reported a great deal, with 22% not feeling that too many demands were made from spouse. Moreover, when assessing relationships with family and friends, 42% of participants reported having at least one or two close friends they could talk to about private matters and can call for help if needed, while 28.4% reported having three to five relatives to whom they are close. Participants were asked whether he/she belonged to any social, recreational, work, church, or other community groups, and 90% reported belonging to some type of social group.

Table 7

Frequencies: Social Support among HF Participants with Depressive Symptoms Data

Indicator	n	%
Martial Status		
Married	**170**	**59.2**
Separated	8	2.8
Divorced	45	15.7
Widowed	40	13.9
Never been married	23	8.0
# of Years Married		
Less than 25 years	**136**	**47.4**
25 to 50 years	118	41.1
Greater than 50 years	7	2.4
Currently living with spouse or another person		
Yes	**167**	**58.2**
No	117	40.8
Feel cared for (n=167)		
A great deal	**96**	**33.4**
Quite a bit	41	14.3
Some	21	7.3
A little	6	2.1
Not at all	3	1.0

(*table continues*)

Indicator	n	%
Feel too many demands (n=167)		
A great deal	13	4.5
Quite a bit	18	6.3
Some	40	13.9
A little	31	10.8
Not at all	**64**	**22.3**
Number of close friends		
None	38	0.7
1 or 2	**121**	**42.2**
3 to 5	86	30.0
6 to 9	20	7.0
10 or more	20	7.0
Number of relatives close to		
None	12	4.2
1 or 2	68	23.7
3 to 5	**80**	**27.9**
6 to 9	51	17.8
10 or more	75	26.1
Number of family/friends see once/month		
None	11	3.8
1 or 2	61	21.3
3 to 5	**111**	**38.7**
6 to 9	41	14.3

(*table continues*)

Indicator	n	%
10 or more	61	21.3
Social Networks		
Yes	**259**	**90.2**
No	27	9.4
Number of Social Networks		
0-5	**247**	**86.1**
6-10	10	3.5
11-15	1	0.3

Coping and stress. Descriptive data shown in Table 8 regarding the covariates coping and stress among HF participants with depressive symptoms indicate that when asked how does he/she cope with stress, approximately 32% reported sometimes talking about it with family or friends, while 28.2% reported often talking about it with family or friends. Additionally, 52% reported not experiencing stress in relationships with others such as spouse, relative, or friend, while 10% reported experiencing stress. Contrarily, when looking at marital status, 58% of married participants reported not experiencing stress in relationships with others. When comparing how men versus women cope with stress, 33% of men reported sometimes talking about it with family or friends, and 36% reported experiencing mild stress in relationships with others. While 33% of participants with less than high school diploma reported coping with stress by talking about it with family or friends, 51% of those with some college or higher education reported experiencing mild stress in relationships with others. Lastly, 37% of participants 55-64 and 65-74 years of age almost always cope with stress by talking with family or friends; however, 32% of 55-64 years old experience mild stress in relationships with others.

Table 8

Frequencies: Coping and Stress Among Participants with HF and Depressive Symptoms

Indicator	n	%
Coping		
Never	3	1.0
Seldom	25	8.7
Sometimes	**92**	**32.1**
Often	81	28.2
Almost Always	49	17.1
Stress		
Not Stressful	148	51.6
Mildly Stressful	72	25.1
Moderately Stressful	35	12.2
Very Stressful	29	10.1

Depression descriptive data. When looking at the depressive symptom scores measured by the CES-D during Exam 1, previous researchers classified participants into major or minor depressive symptomatology using cut points of score 16 to 21 as minor symptomology and a score of greater than or equal to 21 as major symptomology (O'Brien et al., 2015). Of the 287 participants that completed the CES-D, the depressive scores ranged from 0-44 with a mean score of 12.22. Approximately, 74% (*N*=212) of the participants reported no depressive symptoms, with 11% (*N*=32) reporting minor depressive symptomology, and 15% (*N*=43) reporting major depressive symptomology. Most of the participants with minor symptomology was distributed between the 65 to 74 age groups and those with major depressive symptomology were 45 to 54 age groups (34% and 36%, respectively). Additionally, 57% of the participants with minor symptomology were married for less than 25 years. When comparing minor depressive symptomology to major depressive symptomology as it relates to participant's relationships with others, those reporting having one or two friends (41% and 47%, respectively) and three to five family (34% and 30%, respectively) he/she is close to, or get to see three to five family/friends per month (31% and 48%, respectively) the majority had major depressive symptomology. Similarly, 88% of participants involved with social groups such as church, social clubs, or community groups had major depressive symptomology. These descriptive results indicate a possible relationship different types of social support with reported depressive symptoms.

JHS Exam 3 Participants

From the overall JHS, 1,487 participants were lost to follow-up by the Exam 3 (N=3,819) visit, which took place during 2009-2013. Of these, 887 had a diagnosis of HF according to medical chart abstraction during the Exam 3. However, for this study, 633 were excluded due to being under the age of 35 years (n=6) and having missing major depressive episode data (n=27), leaving 254 for analysis.

Table 9 provides descriptive data on the demographic characteristics of these participants during Exam 3 which consisted of 203 female participants (79.9%) and 51 male participants (20.1%). The majority of the participants were distributed between the

45-54 and 55-64 age groups (27.2% and 35.4%, respectively), with a mean age of 60 years. Approximately, 50% of the population had some college education or greater, while 31% had less than high school diploma. Additionally, an estimated 25% income status was upper-middle class and 23% were lower-middle class. Similar, to the dataset from Exam 1, when comparing the demographics of the study participants from Exam 3 to the general study population of the JHS (data not shown) the distribution of participant's age, gender, education, and income is similar indicating generalizability among this subset of the study population.

Table 9

Frequencies: Demographics of Study Participants with HF during Exam 3 (N=254)

Indicator	*n*	%
Gender		
Male	51	20.1
Female	**203**	**79.9**
Age Group		
35-44	17	6.7
45-54	69	27.2
55-64	**90**	**35.4**
65-74	45	17.7
75 and older	33	13.0
Education Level		
Less than High School	39	15.0
High School or GED	65	25.0
Some college or College Graduate	**156**	**60.0**
Income		
Poor	56	22.0
Lower-Middle	59	23.2
Upper-Middle	**63**	**24.8**
Affluent	40	15.7

Table 10 illustrates descriptive data related to participants' reporting major depressive episode perceived social support as measured by the Social Support Form (SOCA) completed during Exam 1. The data show that 52% of the participants reported being married and living with his/her spouse. Of those married, 54.7% have been married for less than 25 years. When asked how much his/her spouse make him/her feel loved and cared for, 33% reported a great deal, and with 18% not feeling that too many demands were made from spouse. Moreover, when assessing relationships with family and friends, 44% of participants reported having at least 1 or 2 close friends they could talk to about private matters and can call for help if needed, and 31% reported having 3 to 5 relatives they are able to see at least once per month. Participants were asked whether or not he/she belonged to any social, recreational, work, church, or other community groups, and 80% reported belonging to some type of social group.

Table 10

Frequencies: Social Support among HF Participants Reporting Major Depressive Episode

Indicator	n	%
Martial Status		
Married	**132**	**52.0**
Separated	13	5.1
Divorced	48	18.9
Widowed	30	11.8

(*table continues*)

Indicator	n	%
Never been married	31	12.2
# of Years Married		
Less than 25 years	**136**	**47.4**
25 and greater	118	43.5
Currently living with spouse or another person		
Yes	**140**	**55.1**
No	114	44.9
Feel cared for		
A great deal	**84**	**33.1**
Quite a bit	25	9.8
Some	20	7.9
A little to not at all	9	3.6
Feel too many demands		
A great deal	11	4.3
Quite a bit	16	6.3
Some	33	13.0
A little	31	12.2
Not at all	**46**	**18.1**
# of close friends		
None	26	10.2
1 or 2	**111**	**43.7**
3 to 5	83	32.7
6 to 9	18	7.1

(*table continues*)

Indicator	n	%
10 or more	16	6.3
# of relatives close to		
0 or 2	**85**	**33.5**
3 to 5	68	26.8
6 to 9	30	11.8
10 or more	71	28.0
# of family/friends see once/month		
None	10	3.9
1 or 2	61	24.0
3 to 5	**78**	**30.7**
6 to 9	35	13.8
10 or more	70	27.6
Social Networks		
Yes	**203**	**79.9**
No	51	20.1
# of Social Networks		
0-5	**193**	**76.0**
6-15	9	3.4

Coping and Stress. Descriptive data shown in Table 11 regarding the covariates coping and stress among HF participants reporting major depressive episode indicate that when asked how does he/she cope with stress, approximately 32% reported sometimes talking about it with family or friends, while 8% reported seldom talking about it with family or friends. Additionally, 44% reported not experiencing stress in relationships with others such as spouse, relative, or friend, while 13% reported experiencing stress. Contrarily, when looking at marital status, 51% of married participants reported experiencing stress in relationships with others. Similar to Exam 1 comparison of how men versus women cope with stress, majority of women (77%) reported sometimes talking about it with family or friends, and 85% reported experiencing mild stress in relationships with others. Lastly, 27% of participants 45-54 and 65-74 years of age often cope with stress by talking with family or friends; however, 38% of 55-64 years old experience mild stress in relationships with others.

Table 11

Frequencies: Coping and Stress Among Participants with HF and Depressive Symptoms

Indicator	n	%
Coping		
Never	2	0.8
Seldom	21	8.3
Sometimes	**81**	**31.9**
Often	66	26.0
Almost Always	29	11.4
Stress		
Not Stressful	**111**	**43.7**
Mildly Stressful	72	28.3
Moderately Stressful	37	14.6
Very Stressful	34	13.4

Depression Descriptive Data. When looking at whether or not participants had a major depressive episode as measured by the MDEA during Exam 3, study participants were considered having a major depressive episode if he/she responded “yes” to five or more of the questions within the first section of the questionnaire. Of the 254 participants that completed the MDEA approximately 54% (N=137) of the participants responded was considered to have a major depressive episode, with 77% (N=106) being women. The majority of the participants with major depressive episode was distributed between the 45-54 and 55-64 age groups (34% and 39%, respectively). Additionally, 55% of the participants with major depressive episode were married and majority (60%) being married for less than 25 years. Interestingly, when looking at participant’s relationships with others, those reporting having 1 or 2 friends (42%) and 3 to 5 friends (34%) he/she is close to, or get to see 10 or more relatives (28%) per month had major depressive episode. Similarly, 77% of participants involved with social groups such as church, social clubs, or community groups had major depressive episode. Similar to the descriptive results of the CES-D from Exam 1, these descriptive results indicate a possible relationship between having social support from family and friends and involvement with social networks with reporting of major depressive episode.

Preliminary Analysis Procedures

Preliminary Comparative Analyses

The independent variables used to examine the research questions are described in Table 7. The analysis indicates that 85% of the study population reporting depressive symptoms have minor depressive symptomology during Exam 1; however, 54% of the study population reported major depressive disorder during Exam 3. Further analysis was conducted to examine the association of depressive symptoms and social support (marital status, family/friend relationship, social network, emotional support) among study participants with HF. Additionally, the independent variables were tested for collinearity.

Chi-square tests of independence were conducted to determine whether there were relationships between depressive symptoms and social support for both Exam 1 and Exam 3. For Exam 1, depressive symptoms were categorized as no depressive symptoms, minor depressive symptomology, and major depressive symptomology; and for Exam 3 it is categorized as major depressive episode or no major depressive episode. As shown in Table 12, when looking at marital status, during Exam 1, while 58% of the participants with major depressive symptomology reported being married the relationship between depressive symptoms and marital status was not significant. Overall, the results indicated no significance between the different types of social support (marital status, emotional support, family/friend relationships, and social networks) and depressive symptoms among JHS participants with HF.

Table 12

Comparative Analysis of Minor and Major Depressive Symptoms and Social Support in Exam 1 (n=287)

Characteristic	X^2	*p*	phi
Marital Status	8.39	.591	.171
Living with spouse	3.42	.490	.109
Emotional Support			
Feeling cared for	11.75	.302	.202
Feeling too much demand	8.88	.543	.176
Family/Friend Relationship			
Close friends	9.70	.467	.184
Close family	7.61	.667	.163
F*amily/friends see once/month*	5.54	.852	.139
Social Network	.643	.958	.047

Comparatively, in Exam 3, 55% of the participants with major depressive episode was married; however, as shown in Table 13 the relationship between major depressive episode and marital status was not significant, X^2 (1, n=254) =4.48, p=.345, phi=0.133, as well as, living with spouse or partner, X^2 (1, n=254) =2.69, p=.101, phi=-0.103. Likewise, among those living with spouse or partner, there was no significant relationship between major depressive episode and feeling cared for by spouse or partner, X^2 (1, n=254) =4.61, p=.465 phi=0.135, and feeling too much is demanded of them X^2 (1, n=254) =7.70, p=.174, phi=0.174. Again, when looking at major depressive episode and family/friend relationships, there was no significance between the number of close friends, X^2 (1, n=254) =1.38, p=.848, phi=0.074, number of close relatives, X^2 (1, n=254) =1.17, p=.883, phi=0.068, or having family/friends that can be seen at least once per month, X^2 (1, n=254) =1.54, p=.820, phi=0.078. Furthermore, there was no significant relationship between major depressive episode and belonging to any type of social group such as church or community group, X^2 (1, n=254) =1.20, p=.272, phi=0.069.

Table 13

Comparative Analysis of Major Depressive Episode and Social Support in Exam 3 (n=254)

Characteristic	X^2	*p*	phi
Marital Status	4.48	0.345	0.133
Living with spouse	2.69	0.101	0.103
Emotional Support			
Feeling cared for	4.61	0.465	0.135
Feeling too much demand	7.70	0.174	0.174
Family/Friend Relationship			
Close friends	1.38	0.848	0.074

(*table continues*)

Characteristic	X^2	*p*	phi
Close family	1.17	0.883	0.068
F*amily/friends see once/month*	1.54	0.820	0.078
Social Network	1.20	0.272	0.069

The Relationship between Depressive Symptoms and Social Support (Research Question 1)

The first research question was aimed to determine the relationship between social support (marital status, family/friend relationship, social network, and emotional support) and depressive symptoms. Since the dependent variable, depressive symptoms have three categories: no depressive symptoms, minor depressive symptomology, and major depressive symptomology, a multinomial logistic regression was conducted. Marital status, family/friend relationship, social network, and emotional support were entered into the model as predictors of depressive symptoms, with no depressive symptoms being the reference category. When comparing study participants with minor and major depressive symptomology to those reporting no depressive symptoms, there were no significance among the predictors ($p>0.05$). With there being no significance, the null hypothesis was accepted indicating there is no association between marital status, family/friend relationship, social networks, emotional support, and depressive symptoms as measured by the CES-D during Exam 1.

Shown in Table 14 are the p-values, exponentiated B values Exp(B), odds ratios (OR), and the 95% confidence intervals of the OR among those with minor and major depressive symptomology. The results in Table 14 indicate that marital status, family/friend relationships, social network, and emotional support does not significantly predict depressive symptoms ($p>0.05$) among participants with HF. However, as seen below when looking at those with minor depressive symptomology, there was an increasing likelihood of participants being married, OR=1.14, 95% CI [.840, 1.54], living with spouse, OR= 1.08, 95% CI [.178, 6.51], having close friends and family they can visit at least once per month, OR= 1.26, 95% CI [.811, 1.95], and is a part of social groups, OR= 1.28 95% CI [.362, 4.51]. Similarly, for those with major depressive symptomology there was an increased likelihood of being married, OR=1.26 95% CI [.928, 1.71], living with spouse OR=3.20 95% CI [.685, 14.95], and having close friends OR= 1.20 95% CI [.843, 1.72].

Table 14

Logistic Regression Results for Exam 1 (N=287)

				95% CI	
Variables	*B*	Sig.	*OR*	Lower	Upper
Minor depressive symptomology					
Marital status	**.129**	**.406**	**1.14**	**.840**	**1.54**
Live with spouse	**.074**	**.936**	**1.08**	**.178**	**6.51**
Feel loved	-.147	.634	.864	.473	1.58
Feel too many demands	-.093	.637	.911	.620	1.34
Close friends	-.028	.890	.972	.651	1.45
Close family	-.330	.111	.719	.480	1.08
Visit family/friends	**.228**	**.308**	**1.26**	**.811**	**1.95**
Social groups	**.244**	**.308**	**1.28**	**.362**	**4.51**

(*table continues*)

				95% CI	
Variables	*B*	Sig.	*OR*	Lower	Upper
Major depressive symptomology					
Marital status	**.229**	**.139**	**1.26**	**.928**	**1.71**
Live with spouse	**.1.16**	**.139**	**3.20**	**.685**	**14.95**
Feel loved	-.096	.679	.909	.578	1.43
Feel too many demands	-.223	.163	.800	.585	1.09
Close friends	**.186**	**.307**	**1.20**	**.843**	**1.72**
Close family	-.187	.303	.829	.581	1.18
Visit family/friends	-.091	.640	.913	.622	1.34
Social groups	-.152	.775	.859	.303	2.44

Note. OR=odds ratio. CI= confidence interval. **OR>1**

[1] Reference category is no depressive symptoms.

The Relationship between Major Depressive Episode and Social Support (Research Question 2)

The second research question was aimed to determine the relationship between social support (marital status, family/friend relationship, social network, and emotional support) and depressive symptoms as measured by the Major Depressive Episode form during Exam 3. A binary logistic regression was conducted using major depressive episode as the dependent variable and marital status, family/friend relationship, social network, and emotional support as independent variables. The Cox and Snell (R^2=0.294) indicate that approximately 29% of the variation among the variables can be explained by social support. While the null hypothesis of the model predicted 55% chance of there being major depressive episode, with there being no significance, the null hypothesis was accepted indicating there is no association between marital status, family/friend relationship, social networks, and emotional support and depressive symptoms as measured by the MDEA during Exam 3.

Shown in Table 15 are the p-values, exponentiated B values Exp(B), odds ratios (OR), and the 95% confidence intervals of the OR. The results in Table 15 indicate that marital status, family/friend relationships, social network, and emotional support do not significantly predict major depressive episode ($p>0.05$) among participants with HF. However, when looking at the model with the variables the odds ratio for married participants indicate, respondents were three times likely to have major depressive episode compared to those that were not married. Additionally, when looking at emotional support among the married participants, those not feeling loved by spouse were approximately seven times more likely to have major depressive episode (OR=6.71), and those feeling too many demands quite a bit were almost five times as likely to have major depressive episode (OR=4.52). Contrarily, when looking at relationships with friends, those indicating having one to two close friends were four times as likely to have major depressive episode (OR=4.11), but those with no close family were eleven times likely to have major depressive episode (OR=11.19).

Table 15

Logistic Regression Results for Exam 3 (N=254)

				95% CI	
Variables	*B*	Sig.	*OR*	Lower	Upper
Marital Status					
Divorced	-1.25	0.12	0.29	0.62	17.94
Married	**1.17**	**0.46**	**3.23**	**0.14**	**74.13**
Not Married	-0.02	0.99	0.99	0.09	9.74
Feel Loved					
A great deal	-41.32	0.99	.000	.000	
Quite a bit	0.56	0.74	1.75	0.07	45.26
Some	0.83	0.64	2.29	0.07	71.41
A little	1.29	0.50	3.67	0.08	164.89
Not at all	**1.90**	**0.37**	**6.71**	**0.11**	**421.79**
Too many demands					
A great deal	22.88	1.00		.000	22.88

				95% CI	
Variables	*B*	Sig.	*OR*	Lower	Upper
					(*table continues*)
Quite a bit	**1.51**	**0.26**	**4.52**	**0.33**	**62.01**
Some	.296	.738	1.345	.237	7.616
A little	-0.85	0.49	0.43	0.04	4.92
Not at all	-0.51	0.54	0.60	0.122	2.99
Close Friends					
None	1.15	0.34	3.16	0.29	33.44
1-2	**1.41**	**0.14**	**4.11**	**0.62**	**27.19**
3-5	1.11	0.27	3.03	0.43	21.45
6-9	0.48	0.72	1.62	0.12	21.55
Close Family					
None	**2.42**	**0.21**	**11.19**	**0.25**	**498.17**
1-2	0.34	0.71	1.40	0.24	8.13
3-5	0.55	0.47	1.73	0.39	7.72
6-9	-1.05	0.21	0.35	0.07	1.81
None	-.028	.044	.972	.275	3.440

Note. OR=odds ratio. CI= confidence interval. **OR>1**

The Relationship Between the Change in Depressive Symptoms and Social Support (Research Question 3)

The third research question was aimed to determine the relationship between social support (marital status, family/friend relationship, social network, and emotional support) and the change in depressive symptoms overtime from Exam 1 to Exam 3. For this question, an analysis of study participants depression data from Exams 1 and 3 were examined to determine the change. When looking at the descriptive frequencies, there was 167 study participants with complete depression data for both time periods. Of these, 56.9% did not have a change in depressive symptoms from Exam 1 to Exam 3. Overall, there were four categories of change in depression that took place overtime with change from no depressive symptomology to major depressive episode (16%), major depressive symptomology to no major depressive episode (10%), minor depressive symptomology to no major depressive episode (9%), and minor depressive symptomology to major depressive episode (8%). For the analysis, these were entered in an ordinal fashion with no depressive change being the reference group.

Additionally, chi-square tests of independence were conducted to determine whether there were relationships between the change in depressive symptoms over time and social support. As shown in Table 16, when looking at marital status, 45% of the participants whose depressive symptoms changed overtime reported being married;

however, the relationship between change in depressive symptoms overtime and marital status was not significant, X^2 (1, n=287) =17.03, p=.384, phi=0.319, as well as, living with spouse or partner, X^2 (1, n=287) =4.81 p=.307, phi=0.170. Similarly, among those living with spouse or partner, when examining the relationship between change in depressive symptoms overtime and feeling cared for by spouse or partner, there was no significance, X^2 (1, n=287) =19.63, p=.481, phi=0.343, and feeling too much is demanded of them X^2 (1, n=287) =24.83, p=.208, phi=0.386. When looking at change in depressive symptoms and family/friend relationships, there was no significance between the number of close friends, X^2 (1, n=287) =15.72, p=.473, phi=0.307, number of close relatives, X^2 (1, n=287) =22.53, p=.127, phi=0.367, or having family/friends that can be seen at least once per month, X^2 (1, n=287) =24.09, p=.088, phi=0.380. Lastly, there was no significant relationship between change in depressive symptoms overtime and belonging to any type of social group such as church or community group, X^2 (1, n=287) =1.81, p=.770, phi=0.104.

Table 16

Comparative Analysis of Change in Depressive Symptoms Overtime and Social Support (n=167)

Characteristic	X^2	*p*	phi
Marital Status	17.03	.384	.319
Living with spouse	4.81	.307	.170
Emotional Support			
Feeling cared for	19.63	.481	.343
Feeling too much demand	24.83	.208	.386
Family/Friend Relationship			
Close friends	15.72	.473	.307
Close family	22.53	.127	.367
F*amily/friends see once/month*	24.09	.088	.380
Social Network	1.81	.770	.104

To examine this relationship further, a multinomial logistic regression was conducted using the new depression change variable as the dependent variable and marital status, family/friend relationship, social network, and emotional support as independent variables. For this model, no change in depressive symptoms was the reference category. When comparing study participants that had a change in depressive symptoms overtime to those who did not, there was no significance among the predictors (p>0.05). With there being no significance, the null hypothesis was accepted indicating there is no association between marital status, family/friend relationship, social networks, emotional support, and change in depressive symptoms overtime from Exam 1 to Exam 3.

Shown in Table 17 are the p-values, exponentiated B values Exp(B), odds ratios (OR), and the 95% confidence intervals of the OR. The results in Table 17 indicate that marital status, family/friend relationships, social network, and emotional support does not significantly predict change in depressive symptoms overtime (p>0.05) among participants with HF. However, when looking at those with change from no depressive symptoms to major depressive episode, there was an increasing likelihood with marital status, OR=1.89, 95% CI [.570, 6.08], feeling too many demands from spouse, OR= 1.41, 95% CI [.759, 2.63], having close friends, OR=1.25, 95% CI [.681, 2.29], and having close family, OR= 1.46, 95% CI [.759, 2.82]. For those whose depressive symptoms changed from minor depressive symptoms to major depressive episode, there was an increase likelihood that feeling too many demands from spouse predicted the change, OR=1.57, 95% CI [.640, 3.83]. However, when looking at close friends, these participants did not have an increased likelihood of depressive symptoms with OR=0.215, 95% CI [.055, .845], indicating having close friends decreased the likelihood of developing major depressive symptoms over time. There was an increased likelihood that having close friends predicted a change from major depressive symptomology during Exam 1 to no major depressive episode during Exam 3, OR=1.12 95% CI [.496, 2.53], and having family/friends to visit at least once per month, OR= 1.17, 95% CI [.177, 4.09] and being a part of social groups OR=1.69, 95% CI [.177, 16.28]

Table 17

Logistic Regression Results for Change in Depressive Symptoms Over time (N=167)

				95% CI	
Variables	*B*	Sig.	*OR*	Lower	Upper
No depressive symptoms to MDE					
Marital status	.621	.304	1.86	.570	6.08
Feel cared for	-.442	.252	.643	.302	1.37
Feel too many demands	.345	.276	1.41	.759	2.63
Close friends	.221	.474	1.25	.681	2.29
Close family	.381	.255	1.46	.759	2.82
Family/friends visit once/month	-.451	.172	.632	.333	1.22
Social groups	-1.22	.290	.296	.031	2.83
Minor depressive symptoms to MDE					
Marital Status	-2.38	.133	.093	.004	2.06
Feel cared for	-.266	.640	.766	.251	2.34
Feel too many demands	.448	.326	1.57	.640	3.83

(*table continues*)

				95% CI	
Variables	*B*	Sig.	*OR*	Lower	Upper
Close friends	-1.54	.028	.215	.055	.845
Close family	-.115	.793	.891	.376	2.11
Family/friends visit once/month	.419	.308	1.52	.680	3.40
Social groups	-1.13	.355	.322	.029	3.56
Major depressive symptoms to no MDE					
Marital status	-.553	.583	.575	.080	4.15
Feel cared for	-.040	.909	.960	.480	1.92
Feel too many demands	-.297	.352	.743	3.98	1.39
Close friends	.114	.784	1.12	.496	2.53
Close family	-.084	.836	.920	.416	2.03
Family/friends visit once/month	-.227	.587	.797	.352	1.81
Social groups	-.732	.531	.481	.049	4.74
Minor depressive symptoms to no MDE					
Marital status	-.695	.603	.499	.036	6.85
Feel cared for	-.337	.479	.714	.281	1.82
Feel too many demands	-.705	.115	.494	.206	1.89

(*table continues*)

				95% CI	
Variables	*B*	Sig.	*OR*	Lower	Upper
Close friends	-.281	.724	.755	.159	3.59
Close family	-.925	.167	.396	.107	1.473
Family/friends visit	.154	.809	1.17	.333	4.09
Social groups	.530	.646	1.69	.177	16.28

Note. OR=odds ratio. CI= confidence interval.

^{1}Reference category is no depression change.

Summary of Findings

The first research question was aimed to determine the relationship between social support as measured by the Social Support Form and depressive symptoms as measured by the CES-D depression scale among JHS participants with HF during Exam 1. To understand the relationship, an examination of different types of social support were examined (marital status, family/friend relationships, social network, and emotional support). The findings indicated that there was no association between social support the types of social support and depressive symptoms.

The second research question was aimed to determine the relationship between social support as measured by the Social Support Form and depressive symptoms as measured by the MDEA Form among JHS participants with HF during Exam 3. To understand the relationship, an examination of the different types of social support were examined (marital status, family/friend relationships, social network, and emotional support). Similar to the first research question, the findings indicated that there was no association between the types of social support and depressive symptoms.

The third research question was aimed to determine the association between social support and the change in depressive symptoms from Exam 1 to Exam 3 among JHS participants with HF. To understand this relationship, a new variable was created to categorize the change in depression symptoms from Exam 1 to Exam 3 and examined the different types of social support (marital status, family/friend relationships, social network, and emotional support). The findings indicated that there was no association between emotional support, marital status, family relationship, and social networks and the change in depressive symptoms overtime. However, having close friends decreased the likelihood of developing major depressive symptoms over time.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this research study was to determine whether social support contributes to depressive symptoms among African Americans with HF in the JHS. Particularly, I examined the experience of different types of social support, its relationship to depressive symptoms, and its relationship with the change in depressive symptoms over time among JHS participants with HF. This study was conducted to enhance public health research examining the relationship between social support (marital status, family/friend relationships, emotional support, and social networks) and symptoms of depression among African Americans with HF to determine if there are changes in the relationship. Additionally, I conducted the study to fill the gaps regarding the relationship between social support and depressive symptoms among participants of JHS with HF. Data from the JHS were analyzed to examine this relationship between different types of social support and depressive symptoms. This chapter addresses the findings of this research study, study limitations, recommendations for future research, and social change implications.

Summary and Interpretation of the Findings

There were three research questions examined to determine whether social support contributes to depressive symptoms among African Americans with HF in the JHS. The overall findings of this research study indicated that there was no association between the different types of social support and depressive symptoms among the participants of JHS with HF.

In Chapter 2, the literature review explained the role of social support as it relates to emotional support, marital status, and family/friend relationships in contributing to depressive symptoms among African Americans with HF. Studies that examined social support and depressive symptoms found that social support was important to reduce symptoms of depression (see Heo et al., 2014). However, those studies were conducted with majority White study populations.

Particularly, emotional support was significantly related to symptoms of depression, and suggested that improvements to emotional support may lead to improvements of symptoms of depression (Heo et al., 2014; Yu et al., 2004). Some study findings suggested that patients with symptoms of depression may have a different perception of emotional support compared to those without symptoms due to their misleading cognition (see Murrough et al., 2011). Emotional support in my research study was measured by participants' perception of how their spouse made them feel (feel loved/cared for and too many demands).

While the findings of the analysis of this study showed no significance of emotional support to predict depressive symptoms, during Exam 3 the findings showed that married participants that did not feel loved or cared for by spouse were seven times more likely to have major depressive episode than those who did feel loved and cared for when compared to participants with no depressive symptoms. Also, those feeling too many demands by their spouse were 11 times more likely to have major depressive episode. Overall, when looking at the change in depressive symptoms from no depressive symptoms during Exam 1 to major depressive episode during Exam 3, and from minor depressive symptomology during Exam 1 to major depressive episode during Exam 3, there was nonsignificant but potentially increased odds of participants reporting feeling too many demands from their spouse. This finding is consistent with previous findings that indicated negative emotional support can increase depressive symptoms (see Taylor et al., 2005).

Similarly, when looking at family and friend relationships over the last 30 years, research findings have shown that social support from family and friends can have a beneficial effect on mental health outcomes such as depression (see George, 2011; Lincoln et al., 2010; Taylor et al, 2015). Previous study findings have indicated that support from family and friends is associated with less depression, and negative interactions with family is associated with higher odds of depression and symptoms of depression (see Taylor et al., 2015). Social support from family and friends helps those that are depressed cope more effectively with personal difficulties and manage emotions (Taylor et al., 2015). For this study, family and friend relationships were measured as how many family and friends study participants were close to, how many family and friends the participant sees per month, and whether they were apart of social networks. While the analysis showed no significance between family and friend relationships to predict depressive symptoms during Exam 1, when looking at minor and major depressive symptomology there was an increased likelihood of minor and major depressive symptoms among the participants that reported having relationships with family/friends and being a part of social networks. The findings during Exam 3 showed that those who reported having one to two close friends were four times more likely to have major depressive episode, and those with no close family were eleven times more likely to have major depressive episode. This finding is inconsistent with previous findings that showed a positive relationship with family and friends decreasing symptoms of depression.

While some earlier research examined patients with HF that had a spouse or lifetime partner showed being married and living with family was a protective factor (Lu et al., 2016), there were inconsistencies with this study's findings. The previous studies that showed this only had 25% of its study population being married or had a live-in partner (Lu et al., 2016). For this research study, most of the study population were married living with their spouse, and marital status showed no significance to predict depressive symptoms. This could be due to the higher prevalence of participants reporting major depressive episode during Exam 3. However, when looking at those with minor and major depressive symptomology during Exam 1, there was an increased likelihood of participants being married and living with spouse. Also, during Exam 3, married participants were three times as likely to have major depressive episode. Overall, when looking at the change in depressive symptoms from no depressive symptoms during Exam 1 to major depressive episode during Exam 3, there was an increased likelihood among married participants, which is inconsistent with previous research indicating being married is associated with fewer depressive symptoms.

Conceptual Model

As described in Chapter 2, when assessing the concept of social support and depressive symptoms among people with HF, having a poor social support system and symptoms of depression have an effect on the morbidity (Chung, Lennie, Dekker et al., 2011; Chung, Mosor et al., 2013). This research study was grounded in the Wilson and Cleary revised conceptual model. Previous research used this model to examine types of social support and their relationship to depressive symptoms in patients with HF (Heo et al., 2014). This model suggests that there may be a relationship between social support and depressive symptoms. Researchers have conducted studies to examine this relationship among a sample of HF patients; however, depression symptoms were measured using the PHQ-9 to assess the frequency of symptoms over the last 2 weeks and social support was categorized as marital status, social networks, emotional and instrumental support, and relationships with providers and family (Heo et al., 2014). For this study, depressive symptoms were measured using the CES-D and Major Depressive Episode forms from the JHS.

The results of these previous studies showed that of all the types of social support, marital status and emotional support were related to physical symptoms (Heo et al., 2014). Individuals with HF that were in some type of relationship (married, cohabitant) had greater emotional support and less severe physical symptoms. Contrarily, there were inconsistencies with this study when looking at this relationship. The findings of this study indicated that being married had a negative effect on depressive symptoms. Overall, when accessing the constructs of the Wilson and Cleary revised model, it showed that social support is essential for reducing symptoms of depression (see Heo et al., 2014); however, this relationship was shown among a majority White population. While the relationship between social support and depressive symptoms have not been confirmed among more racially diverse study populations, there are inconsistencies between findings from previous studies and this research study.

Strengths of the study

African Americans historically are underrepresented in research for major diseases in which they have higher prevalence, and this disproportionate burden of CVD among African Americans have been improved with studies like JHS (Fuqua et al., 2005). There have been reported low participation rates among African Americans in research in the United States due to lack of trust of researchers and healthcare systems, lack of researchers that are minority, cultural barriers, and failure of researchers actively recruiting African Americans (Fuqua et al., 2005). Due to this, the JHS was conducted as an extension of the ARIC study with trusted researchers recruiting African American participants for long-term observation of risk factors for CVD (Fuqua et al., 2005). To date there are still few studies that have focused on the collection of longitudinal data regarding CVD and the multiple factors that influence disease outcome like the JHS has done (Taylor et al., 2005).

The JHS is the largest study regarding CVD among African Americans (Taylor et al., 2005), and while the study population was limited to a single site, the sample size provided the necessary power to determine relationships between types of social support and depressive symptoms. Additionally, the JHS collected longitudinal data for several indicators associated with CVD for more than a decade. These indicators over the years have advanced the role of social epidemiology and have identified areas that need further examination (Fuqua et al., 2005).

My research study was the first to examine whether or not social support contributes to depressive symptoms among JHS study participants with HF, and the first to exam participants during Exam periods 1 and 3. An analysis of the literature indicated there were little to no research regarding the relationship between social support and depressive symptoms among African Americans with HF. Therefore, this study aimed to fill this gap among one of the largest community-based cohort studies of African Americans. While there was no significance among social support to predict depressive symptoms, this necessitates future investigation.

Limitations of the Study

As previously discussed in Chapter 1, there are limitations with this research study's findings. First, this study used a secondary dataset from the JHS; therefore, there were limitations with the data due to the fixed questions from the questionnaires. For example, the data for social support was related to structural components of support such as type (marital status, emotional support, family/friend relationships, and social network) and the frequency of contacts (number of relative and friends close to, number of relative and friends see once per month) rather than the functional components of social support (Jackson Heart Study, 2001). Additionally, the Social Support Form measured participants' perception of being loved and cared for by a spouse, but this was only asked if the participant reported living with a spouse. Those who reported not living with spouse were unable to report whether they felt cared for and loved by their spouse, or whether their spouse demanded too much of them. Moreover, the social support data was only collected during Exam 1 (2000-2004); therefore, the analysis of this association with depressive symptoms in Exam 3 (2009-2013) did not accurately reflect if there were any changes in social support during Exam 3.

Second, the JHS researchers decided to use a different instrument during Exam 3 to measure symptoms of depression because they felt having a direct examination of whether a participant had major depressive episodes would add value to the relationship between the onset of physical disease and depression (JHS, 2010). Unlike the CES-D form that was used to measure depressive symptoms during Exam 1 which produced a score after participants completed the survey, the MDEA was a “yes/no” survey. The survey is constructed in a way that if participants reported “yes” to five or more of the questions in the first section (A1-A3) of the survey, they were coded as having major depressive episode. Due to this, when looking at the descriptive statistics of the participants with HF that reported major depressive episode during Exam 3, most of the study population had major depressive episode according to the survey results. This likely overestimated the prevalence of major depressive episode among this population, which caused for the inability to look at subsets of the population to determine if there were any differences.

Third, while the overall JHS included 5,306 participants, due to the inclusion criteria for this study and the analysis of two different exam periods, this limited the number of participants for Exam 1 (n=524) and Exam 3 (n=887) with heart failure. However, after conducting a posthoc power analysis using the sample size of participants with heart failure and reported depressive symptoms from the CES-D and MDEA, the sample size for Exam 1 (n=287) and Exam 3 (n=254) were analyzed. This resulted in the regression analyses not significantly predicting depressive symptoms when looking at marital status, family/friend relationships, social network, and emotional support. Notably, the p-value for some variables were close to being significant and there were odds ratios greater than 1, indicating a larger sample size might have yielded some significant differences between variables.

Lastly, this study only included African Americans residing in Jackson, MS, which means the study findings are not generalizable to all African Americans residing in Mississippi or across the United States. Due to this, the study did not have a cohort of White participants with heart failure to compare the association of social support and depressive symptoms. The inability to compare this difference among African Americans and Whites reduces the chance to understand how belonging to a particular racial group may influence the association of social support and depressive symptoms. With these limitations in mind, there is justification for the need of future research to be conducted in other geographical areas, using a larger study population, and using a more specific methodology.

Recommendations for Future Research

There are continued inconsistencies in research examining the relationship between social support and depressive symptoms among African Americans. In Chapter 2, there was documentation of previous studies conducted, a description of the differing study populations that were explored, and the deficiency of exploring psychosocial factors associated with HF in the JHS. While the JHS Social Support form provided a widespread approach to the structural components of social support and the frequency of contacts, there are further aspects of this study that need analysis. Focusing on the different types of social support such as marital status, emotional support, family/friend relationships, and social networks did not take into consideration how an individual's self-esteem or appraisal from others would affect their perception of social support. Future research should measure social support by using the Interpersonal Support Evaluation (ISL), which measures the functional components of social support like appraisal, belonging, tangibility, and self-esteem (Jackson Heart Study, 2001).

The JHS collected data for over ten years; however, it was difficult to measure the change in depressive symptoms overtime because the JHS researchers thought using two different instruments to measure symptoms of depression would add value to the relationship between the onset of physical disease and depression. This indicates that future longitudinal research should use one instrument to measure symptoms of depression starting at baseline and followed throughout the study for a more accurate analysis of this change. Additionally, with this study being the first to analyze data collected from the MDEA, further analysis of major depressive episode among JHS participants with HF is needed by assessing the individual questions related to depression.

Lastly, the current study did not include other factors that have been shown by previous research to have an impact on depressive symptoms among HF patients, such as medication adherence and illness perception. Studies that have examined the relationships between medication adherence and illness perception and negative health outcomes have been uncommon among African Americans with HF (Wierenga, 2017).

Therefore, future research needs to examine the relationship between illness perceptions and medication adherence and HF with a larger study population and longitudinal design like the JHS.

Implications for Social Change

It is known that African Americans experience higher rates of HF than any other racial population, regardless of their education and income; therefore, the consideration of other nontraditional social determinants of health is necessary. Despite the lack of significant relationships between the different types of social support (marital status, emotional support, family/friend relationships, and social networks) and depressive symptoms, there are still implications to these study findings. It has been shown that depression has an association with HF among African Americans; therefore, consideration should be given to both the chronic and mental illness to better support these patients. Translating this research into public health practice will require that care plans are carefully constructed to meet the patient's individual needs and include methods that have been adapted based on the individual's social and cognitive differences (Wierenga, 2017).

Research continues to investigate improvements in chronic diseases, while focusing on risk factors, social determinants of health, and developing methodologies that are adjusted. This includes having health promotion messages, availability of resources, and patient-provider relationships; however, history has shown this address only the simple things associated with chronic illnesses among African Americans. Public health needs to take a deeper approach into evaluating the repeated stressors experienced by

African Americans, such as racial and ethnic discrimination and social inequity, which have been associated with the increase in symptoms of depression and earlier onset of chronic illnesses like HF (Spikes et al., 2019). Additionally, the social and cultural environment in which African Americans live adds to the perspective that influences the implementation of screening strategies (Carnethon et al., 2017). Having an increased awareness and acknowledgement of these difficulties can lead to investments of strategies that can work within the limitations of the environment to help promote cardiovascular health of African Americans.

While it has been shown that negative social support is associated with symptoms of depression among individuals with HF, there is a need for improvements in the support that is given by close family and friends. To improve emotional support from family and friends, providing proper education and opportunities for group activities is needed. Because individuals with HF commonly have a relative or friend attend clinic appointments, clinicians may utilize this opportunity to educate family and friends of the importance of positive emotional support (Heo et al., 2014). Additionally, clinicians may teach basic skills to family and friends of how to actively listen to their loved one and express empathy, as well as, encourage them to participate in support interventions. This should be done in conjunction with allowing individuals with HF the opportunity to express their feelings with others (Heo et al., 2014). Likewise, to improve social support for patients with HF who are single, widowed, or separated, clinicians should provide resources for social support, so that they too can benefit from having positive social support.

When looking at symptoms of depressions, it has been posited that African American women may report feeling tired instead of depressed because they feel they must keep it together, whereas African American men may withhold or deny depressive symptoms because they fear being labeled (Walton & Payne, 2016). Additionally, it has been noted that African Americans are inaccurately assessed for depressive symptoms due to their mistrust in mental health professionals, cultural barriers, lack of awareness by practitioners, and reliance on support from religious groups (Walton & Payne, 2016). To better improve depressive symptoms among African Americans, there is a need for more cultural competence among providers and public health practitioners to increase the trust and awareness regarding mental health illnesses such as depression. Moreover, the development of faith-based interventions, especially regarding depression among African Americans with HF can aid with building relationships between faith-based organizations and public health. It has been shown for more than a decade from other interventions that faith-based programs have the ability to improve health outcomes (DeHave, Hunter, Walton, & Berry, 2004). Having this cultural understanding as public health practitioners can aid improved care that is provided to African Americans with HF.

Conclusions

In summary, the literature provided evidence of the association between social support and depressive symptoms among individuals with HF. This research illustrated that while there is no significant relationships between social support and depressive symptoms among African Americans with HF in metro Jackson, MS, those that are married do have an increased likelihood of having depressive symptoms. It was also suggested by this research that having negative emotional support from a spouse such as not feeling loved or cared for, or feeling too many demands from spouse, increases the likelihood of depressive symptoms among individuals with HF.

Continued research is needed to improve strategies regarding social support and its relationship to depressive symptoms among African Americans with HF. Additionally, more is needed from the field of public health for strategies and policies that will increase mental health services, health promotion, and interventions to improve positive psychological health among African Americans with HF.

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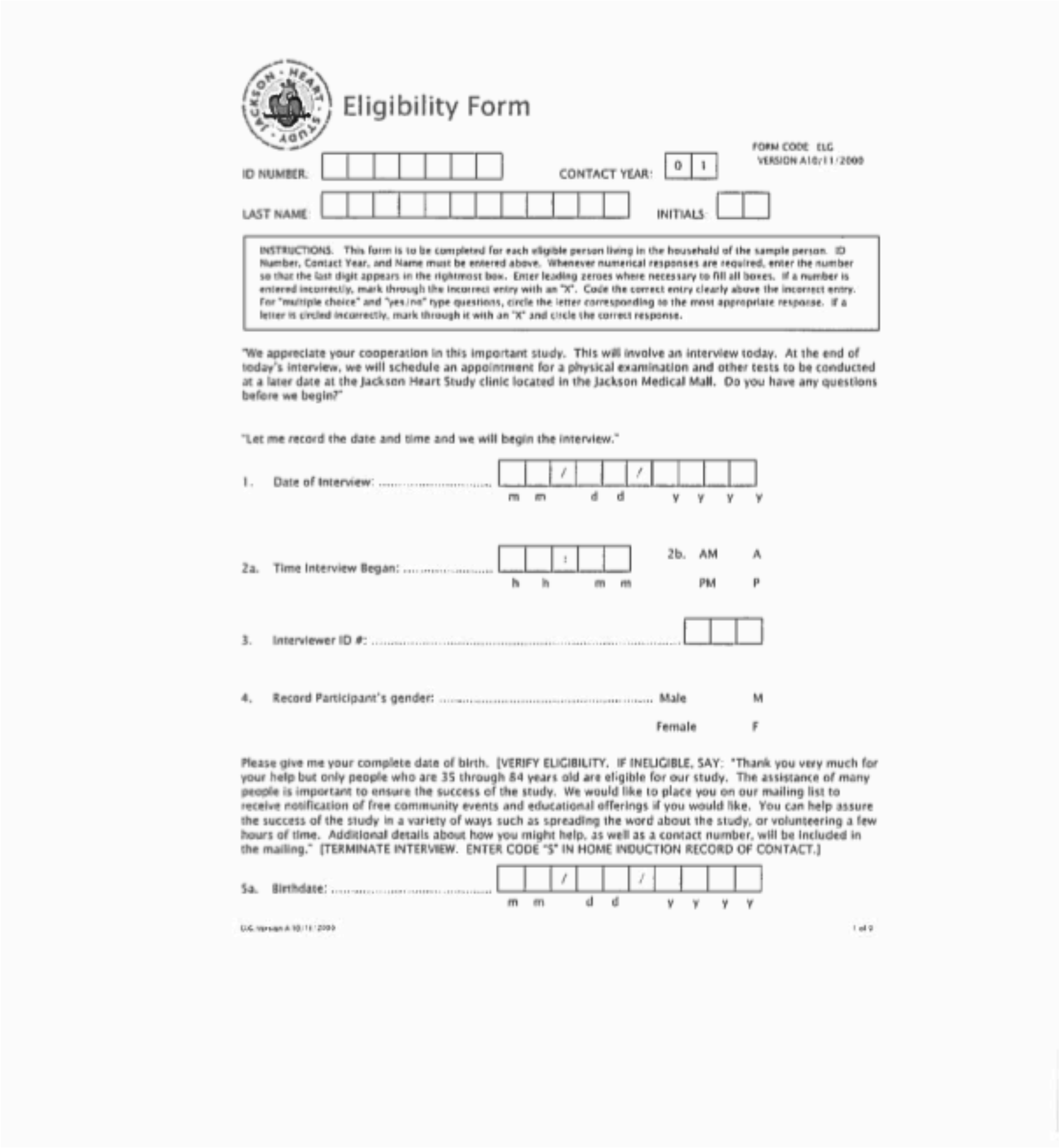
Appendix A: Eligibility Form



Eligibility Form

FORM CODE ELG
VERSION A10/11/2000

ID NUMBER: ☐☐☐☐☐☐☐

CONTACT YEAR: 0 1

LAST NAME: ☐☐☐☐☐☐☐☐☐☐☐☐

INITIALS: ☐☐

INSTRUCTIONS. This form is to be completed for each eligible person living in the household of the sample person. ID Number, Contact Year, and Name must be entered above. Whenever numerical responses are required, enter the number so that the last digit appears in the rightmost box. Enter leading zeroes where necessary to fill all boxes. If a number is entered incorrectly, mark through the incorrect entry with an "X". Code the correct entry clearly above the incorrect entry. For "multiple choice" and "yes/no" type questions, circle the letter corresponding to the most appropriate response. If a letter is circled incorrectly, mark through it with an "X" and circle the correct response.

"We appreciate your cooperation in this important study. This will involve an interview today. At the end of today's interview, we will schedule an appointment for a physical examination and other tests to be conducted at a later date at the Jackson Heart Study clinic located in the Jackson Medical Mall. Do you have any questions before we begin?"

"Let me record the date and time and we will begin the interview."

1. Date of Interview: .... ☐☐/☐☐/☐☐☐☐ (m m / d d / y y y y)

2a. Time Interview Began: .... ☐☐:☐☐ (h h : m m)

2b. AM A
PM P

3. Interviewer ID #: .... ☐☐☐

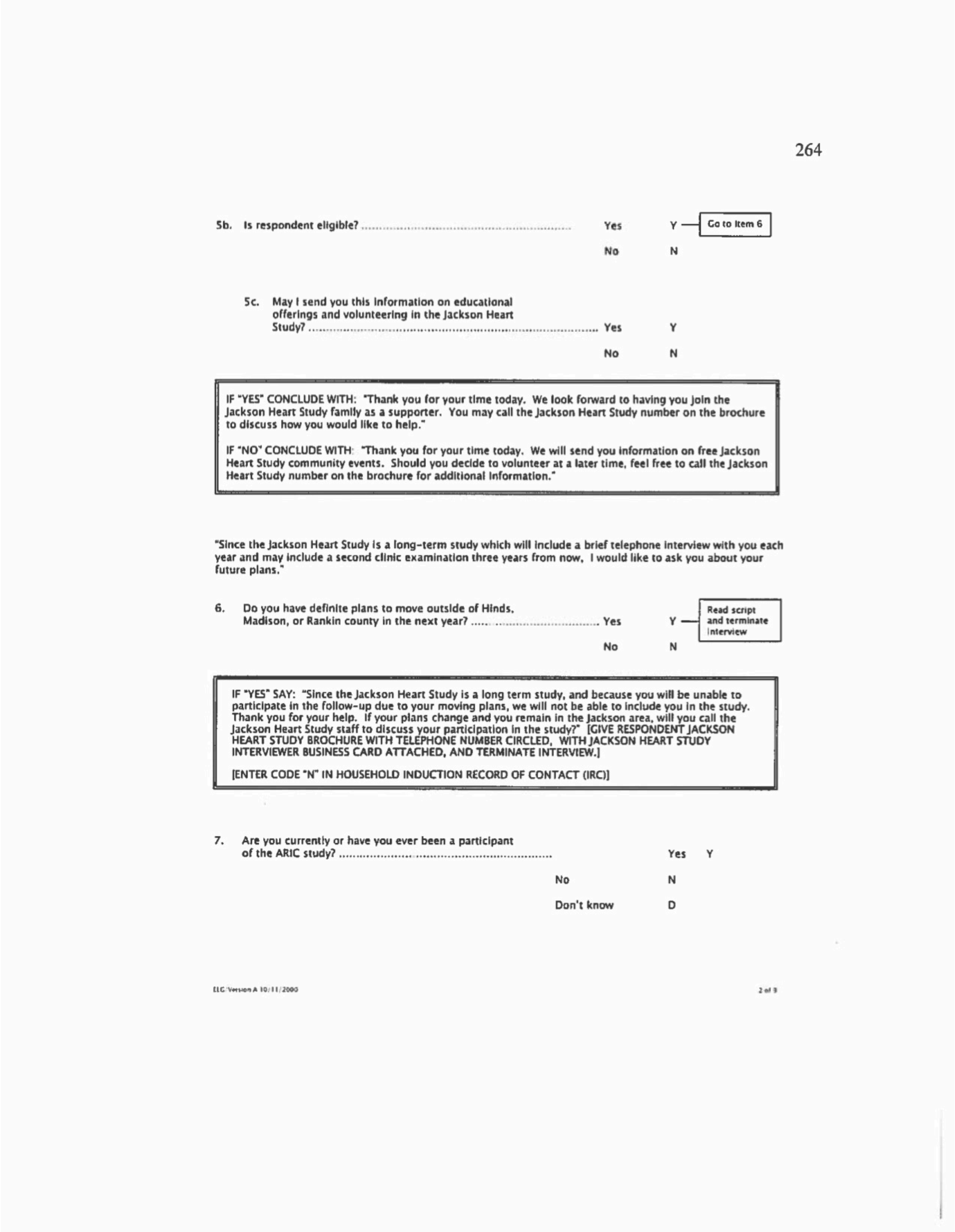
4. Record Participant's gender: .... Male M
Female F

Please give me your complete date of birth. [VERIFY ELIGIBILITY. IF INELIGIBLE, SAY: "Thank you very much for your help but only people who are 35 through 84 years old are eligible for our study. The assistance of many people is important to ensure the success of the study. We would like to place you on our mailing list to receive notification of free community events and educational offerings if you would like. You can help assure the success of the study in a variety of ways such as spreading the word about the study, or volunteering a few hours of time. Additional details about how you might help, as well as a contact number, will be included in the mailing." [TERMINATE INTERVIEW. ENTER CODE "5" IN HOME INDUCTION RECORD OF CONTACT.]

5a. Birthdate: .... ☐☐/☐☐/☐☐☐☐ (m m / d d / y y y y)

ELG Version A 10/11/2000

1 of 9



5b. Is respondent eligible?	Yes	Y	Go to Item 6
	No	N	

5c. May I send you this information on educational offerings and volunteering in the Jackson Heart Study?	Yes	Y
	No	N

IF "YES" CONCLUDE WITH: "Thank you for your time today. We look forward to having you join the Jackson Heart Study family as a supporter. You may call the Jackson Heart Study number on the brochure to discuss how you would like to help."

IF "NO" CONCLUDE WITH: "Thank you for your time today. We will send you information on free Jackson Heart Study community events. Should you decide to volunteer at a later time, feel free to call the Jackson Heart Study number on the brochure for additional information."

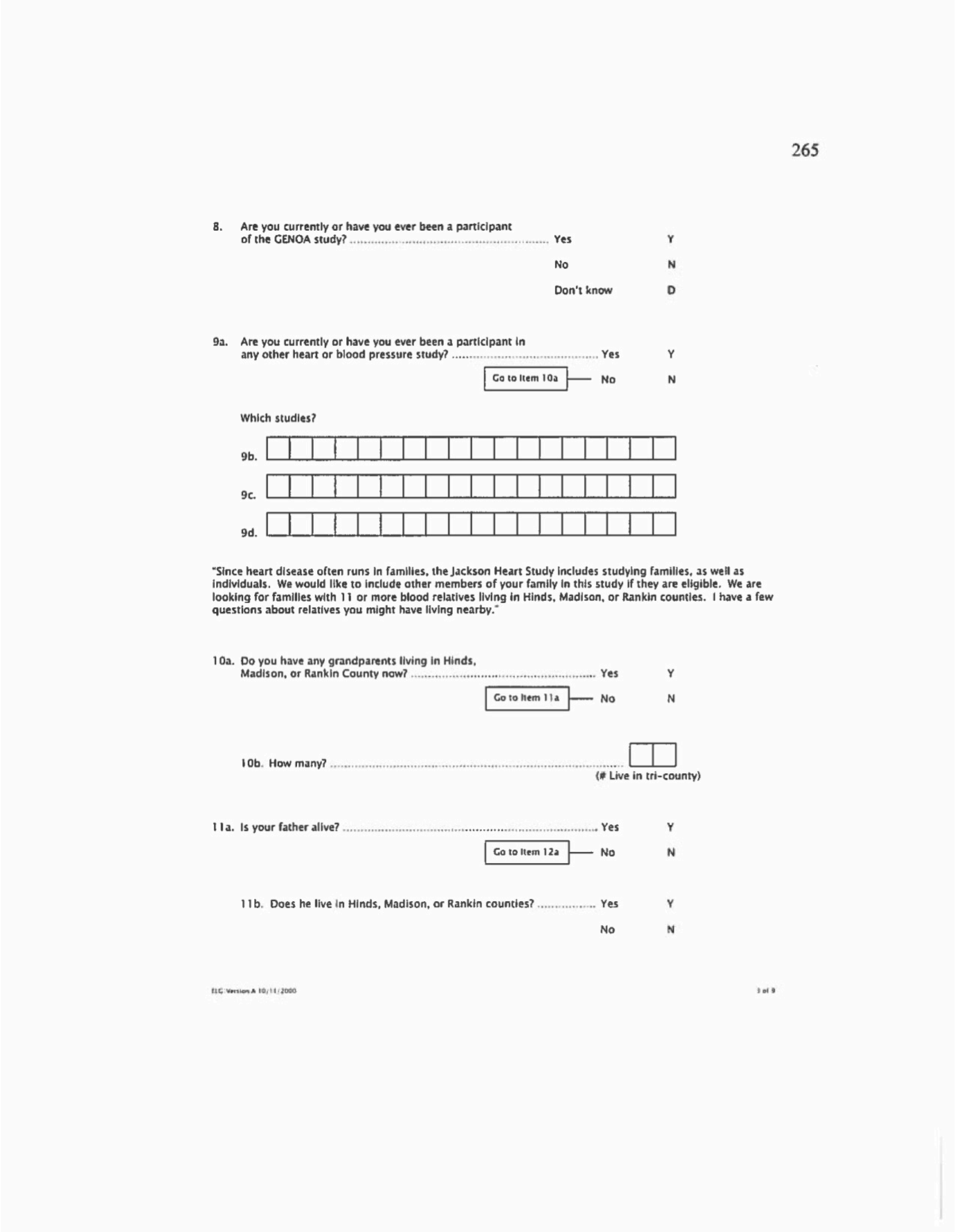
"Since the Jackson Heart Study is a long-term study which will include a brief telephone interview with you each year and may include a second clinic examination three years from now, I would like to ask you about your future plans."

6. Do you have definite plans to move outside of Hinds, Madison, or Rankin county in the next year?	Yes	Y	Read script and terminate interview
	No	N	

IF "YES" SAY: "Since the Jackson Heart Study is a long term study, and because you will be unable to participate in the follow-up due to your moving plans, we will not be able to include you in the study. Thank you for your help. If your plans change and you remain in the Jackson area, will you call the Jackson Heart Study staff to discuss your participation in the study?" [GIVE RESPONDENT JACKSON HEART STUDY BROCHURE WITH TELEPHONE NUMBER CIRCLED, WITH JACKSON HEART STUDY INTERVIEWER BUSINESS CARD ATTACHED, AND TERMINATE INTERVIEW.]

[ENTER CODE "N" IN HOUSEHOLD INDUCTION RECORD OF CONTACT (IRC)]

7. Are you currently or have you ever been a participant of the ARIC study?	Yes	Y
	No	N
	Don't know	D



8. Are you currently or have you ever been a participant of the GENOA study? .... Yes Y

No N

Don't know D

9a. Are you currently or have you ever been a participant in any other heart or blood pressure study? .... Yes Y

Go to Item 10a — No N

Which studies?

9b. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

9c. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

9d. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

"Since heart disease often runs in families, the Jackson Heart Study includes studying families, as well as individuals. We would like to include other members of your family in this study if they are eligible. We are looking for families with 11 or more blood relatives living in Hinds, Madison, or Rankin counties. I have a few questions about relatives you might have living nearby."

10a. Do you have any grandparents living in Hinds, Madison, or Rankin County now? .... Yes Y

Go to Item 11a — No N

10b. How many? .... ☐☐ (# Live in tri-county)

11a. Is your father alive? .... Yes Y

Go to Item 12a — No N

11b. Does he live in Hinds, Madison, or Rankin counties? .... Yes Y

No N

12.a Is your mother alive? .... Yes Y

Go to Item 13 — No N

12b. Does she live in Hinds, Madison, or Rankin counties? .... Yes Y

No N

	Aunts (a)	Uncles (b)	# Live in tri-county (c)	# ≥ 21 years (d)
13. How many aunts and uncles do you have living who are related to you by blood?	☐☐	☐☐	☐☐	☐☐

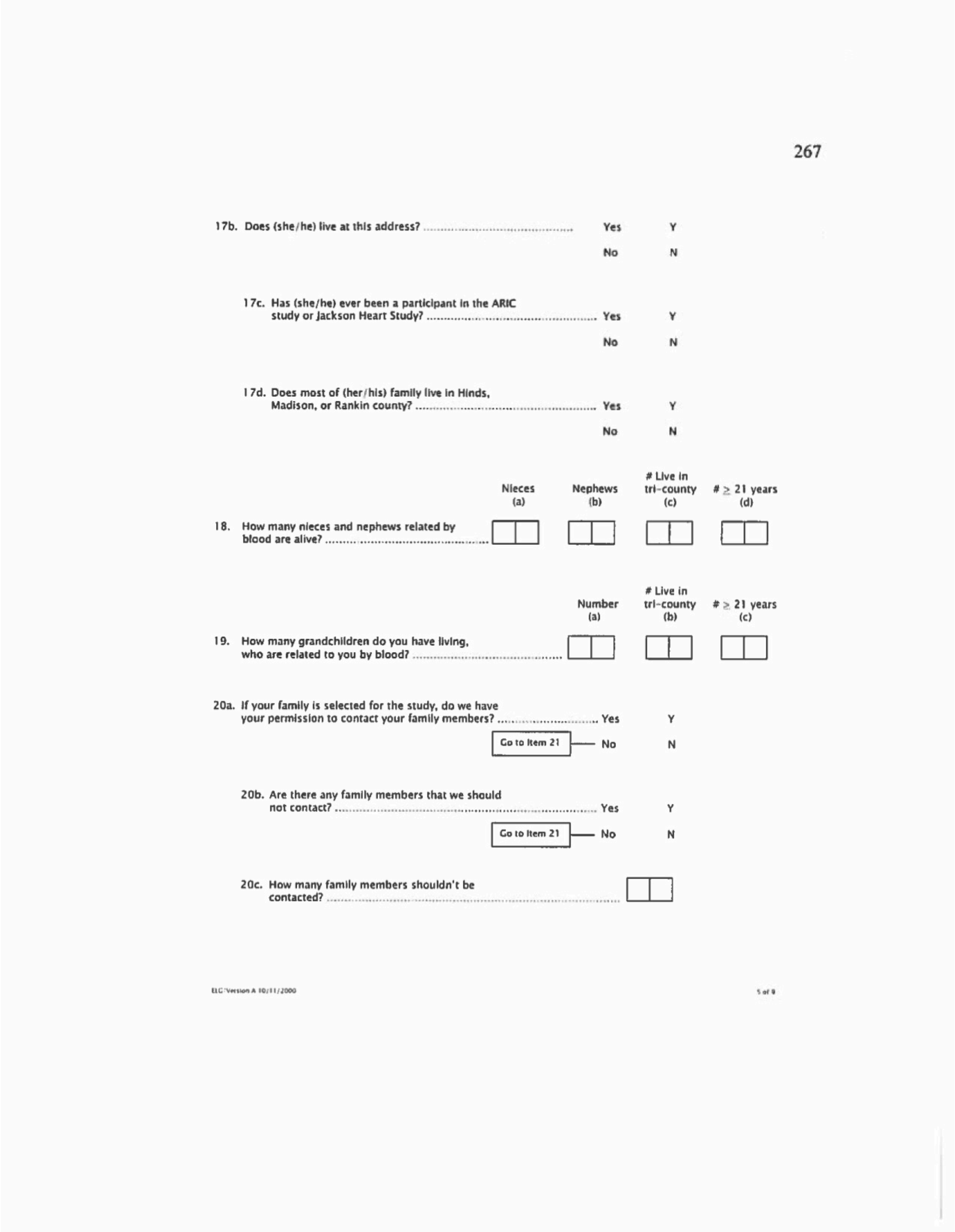
	Brothers (a)	Sisters (b)	# Live in tri-county (c)	# ≥ 21 years (d)
14. How many living, biological brothers and sisters do you have, that is with the same mother and father?	☐☐	☐☐	☐☐	☐☐

	Half Brothers (a)	Half Sisters (b)	# Live in tri-county (c)	# ≥ 21 years (d)
15. How many living, half brothers and sisters do you have, that is with the same mother OR the same father?	☐☐	☐☐	☐☐	☐☐

	Sons (a)	Daughters (b)	# Live in tri-county (c)	# ≥ 21 years (d)
16. How many living, biological sons and daughters do you have?	☐☐	☐☐	☐☐	☐☐

17a. [ASK ONLY IF ITEM 16d IS "01" OR MORE. IF ITEM 16d IS "00," GO TO ITEM 18.] Does the (mother/father) of your children aged 21 years or older live in Hinds, Madison, or Rankin County? .... Yes Y

Go to Item 18 — No N



17b. Does (she/he) live at this address? .... Yes Y
No N

17c. Has (she/he) ever been a participant in the ARIC study or Jackson Heart Study? .... Yes Y
No N

17d. Does most of (her/his) family live in Hinds, Madison, or Rankin county? .... Yes Y
No N

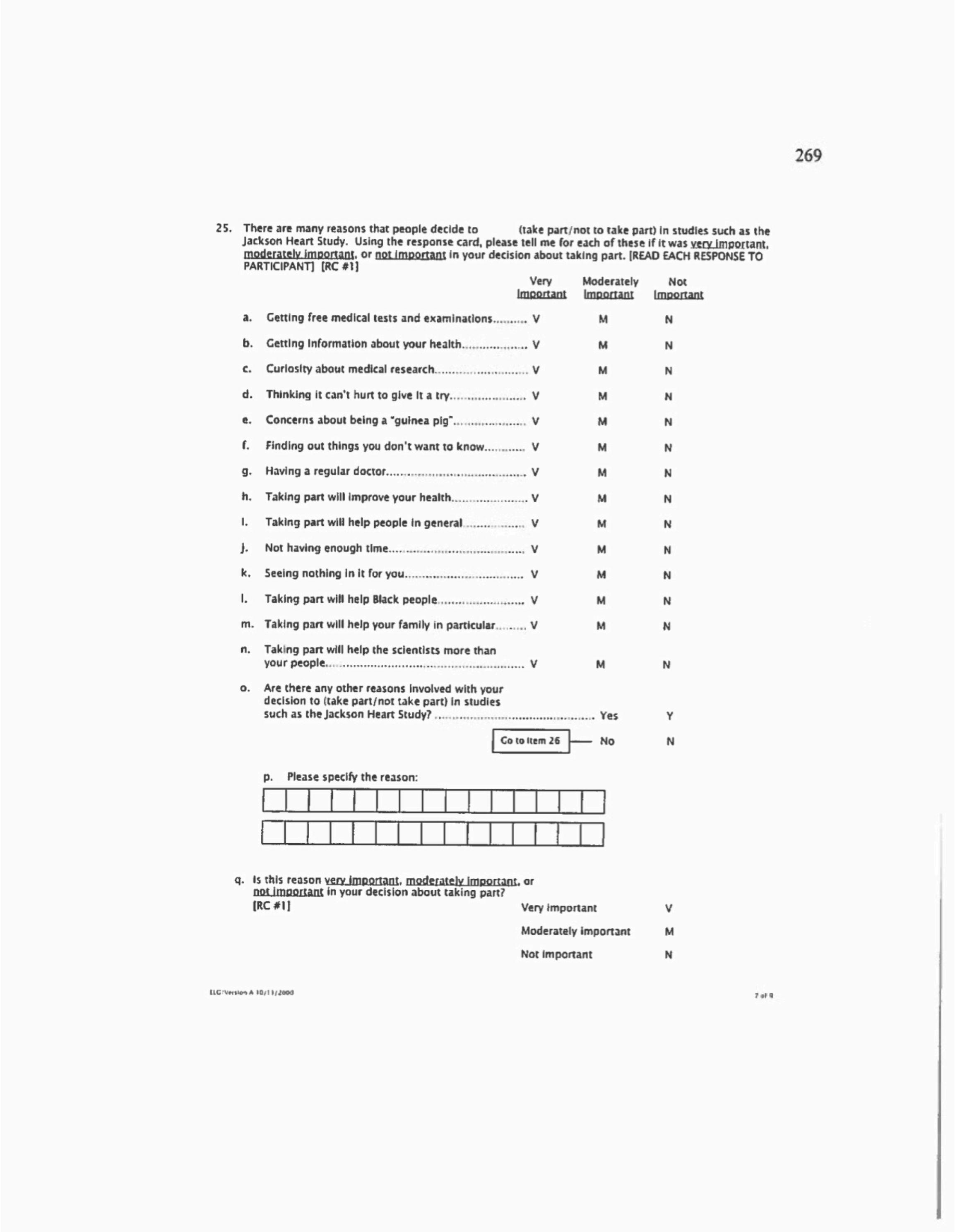
	Nieces (a)	Nephews (b)	# Live in tri-county (c)	# ≥ 21 years (d)
18. How many nieces and nephews related by blood are alive?	☐☐	☐☐	☐☐	☐☐

	Number (a)	# Live in tri-county (b)	# ≥ 21 years (c)
19. How many grandchildren do you have living, who are related to you by blood?	☐☐	☐☐	☐☐

20a. If your family is selected for the study, do we have your permission to contact your family members? .... Yes Y
Go to Item 21 — No N

20b. Are there any family members that we should not contact? .... Yes Y
Go to Item 21 — No N

20c. How many family members shouldn't be contacted? .... ☐☐



25. There are many reasons that people decide to (take part/not to take part) in studies such as the Jackson Heart Study. Using the response card, please tell me for each of these if it was very important, moderately important, or not important in your decision about taking part. [READ EACH RESPONSE TO PARTICIPANT] [RC #1]

		Very Important	Moderately Important	Not Important
a.	Getting free medical tests and examinations..........	V	M	N
b.	Getting information about your health..................	V	M	N
c.	Curiosity about medical research..........................	V	M	N
d.	Thinking it can't hurt to give it a try.....................	V	M	N
e.	Concerns about being a "guinea pig".....................	V	M	N
f.	Finding out things you don't want to know............	V	M	N
g.	Having a regular doctor...	V	M	N
h.	Taking part will improve your health......................	V	M	N
i.	Taking part will help people in general.................	V	M	N
j.	Not having enough time..	V	M	N
k.	Seeing nothing in it for you..................................	V	M	N
l.	Taking part will help Black people.........................	V	M	N
m.	Taking part will help your family in particular.........	V	M	N
n.	Taking part will help the scientists more than your people..	V	M	N

o. Are there any other reasons involved with your decision to (take part/not take part) in studies such as the Jackson Heart Study? .... Yes Y

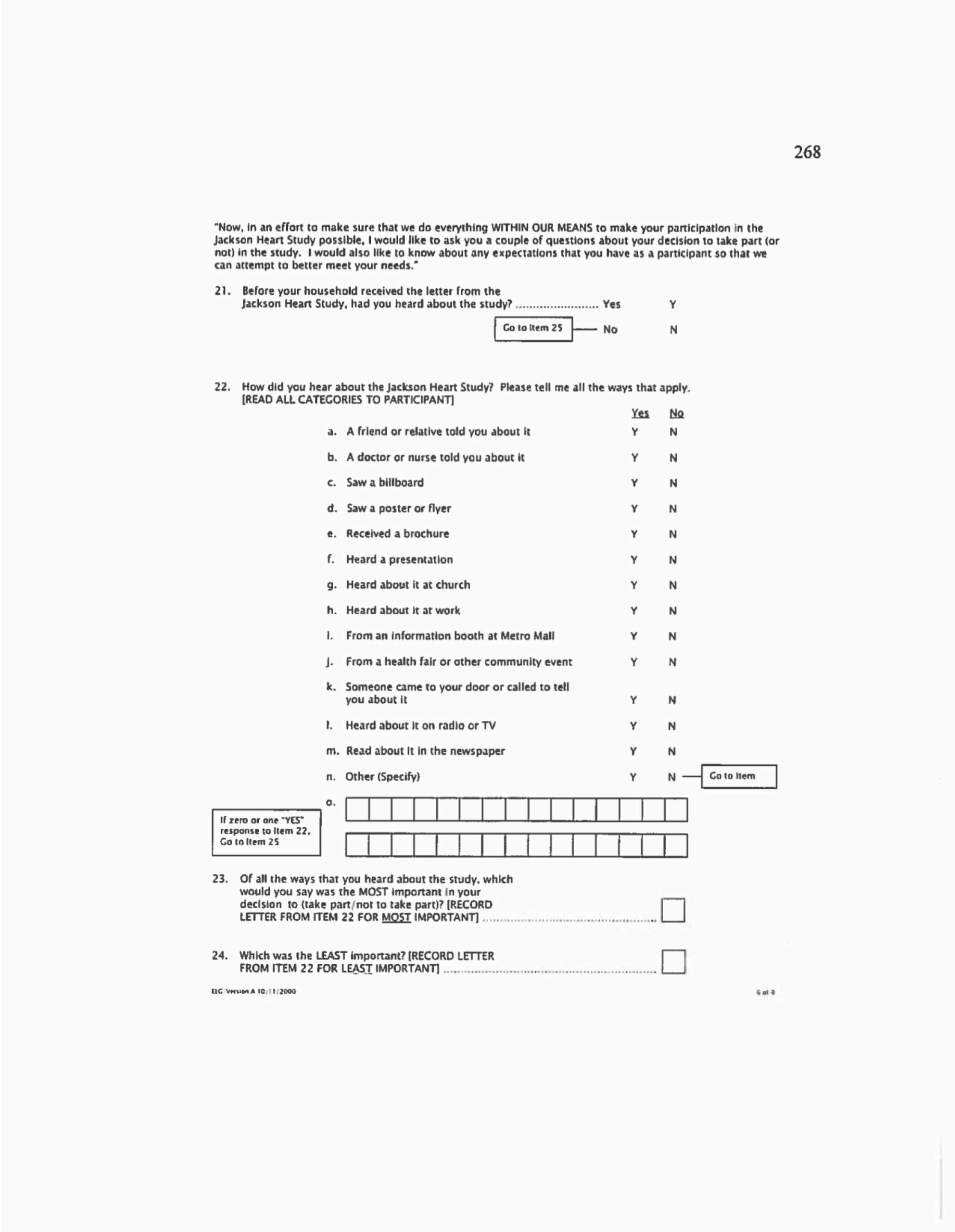
Go to Item 26 — No N

p. Please specify the reason:

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

q. Is this reason very important, moderately important, or not important in your decision about taking part? [RC #1]

Very important V
Moderately important M
Not important N



"Now, in an effort to make sure that we do everything WITHIN OUR MEANS to make your participation in the Jackson Heart Study possible, I would like to ask you a couple of questions about your decision to take part (or not) in the study. I would also like to know about any expectations that you have as a participant so that we can attempt to better meet your needs."

21. Before your household received the letter from the Jackson Heart Study, had you heard about the study? .... Yes Y

Go to Item 25 — No N

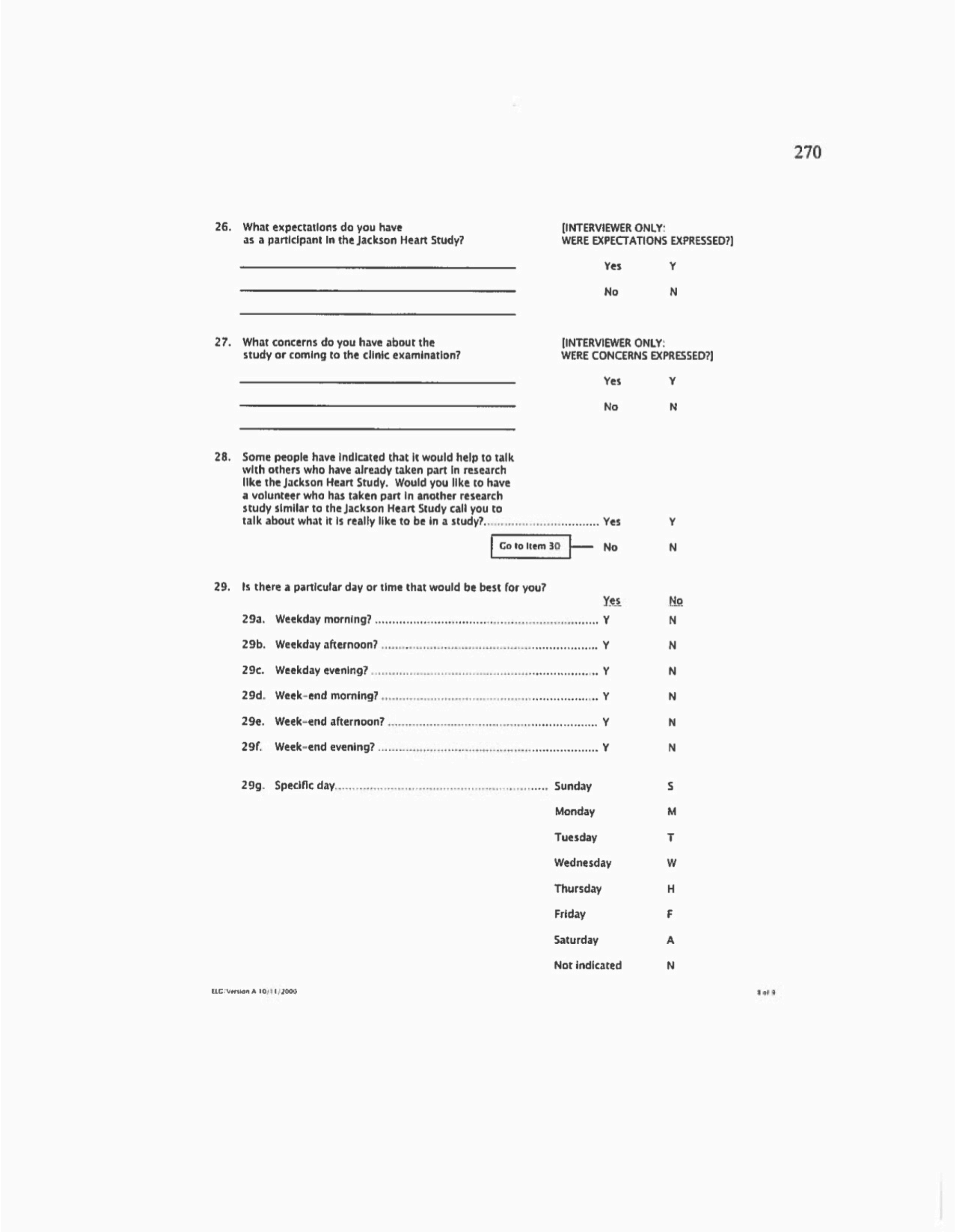
22. How did you hear about the Jackson Heart Study? Please tell me all the ways that apply. [READ ALL CATEGORIES TO PARTICIPANT]

		Yes	No
a.	A friend or relative told you about it	Y	N
b.	A doctor or nurse told you about it	Y	N
c.	Saw a billboard	Y	N
d.	Saw a poster or flyer	Y	N
e.	Received a brochure	Y	N
f.	Heard a presentation	Y	N
g.	Heard about it at church	Y	N
h.	Heard about it at work	Y	N
i.	From an information booth at Metro Mall	Y	N
j.	From a health fair or other community event	Y	N
k.	Someone came to your door or called to tell you about it	Y	N
l.	Heard about it on radio or TV	Y	N
m.	Read about it in the newspaper	Y	N
n.	Other (Specify)	Y	N — Go to Item
o.	☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐		

If zero or one "YES" response to Item 22, Go to Item 25

23. Of all the ways that you heard about the study, which would you say was the MOST important in your decision to (take part/not to take part)? [RECORD LETTER FROM ITEM 22 FOR <u>MOST</u> IMPORTANT] .... ☐

24. Which was the LEAST important? [RECORD LETTER FROM ITEM 22 FOR <u>LEAST</u> IMPORTANT] .... ☐



26. What expectations do you have as a participant in the Jackson Heart Study?

____

____

____

[INTERVIEWER ONLY:
WERE EXPECTATIONS EXPRESSED?]

Yes	Y
No	N

27. What concerns do you have about the study or coming to the clinic examination?

____

____

____

[INTERVIEWER ONLY:
WERE CONCERNS EXPRESSED?]

Yes	Y
No	N

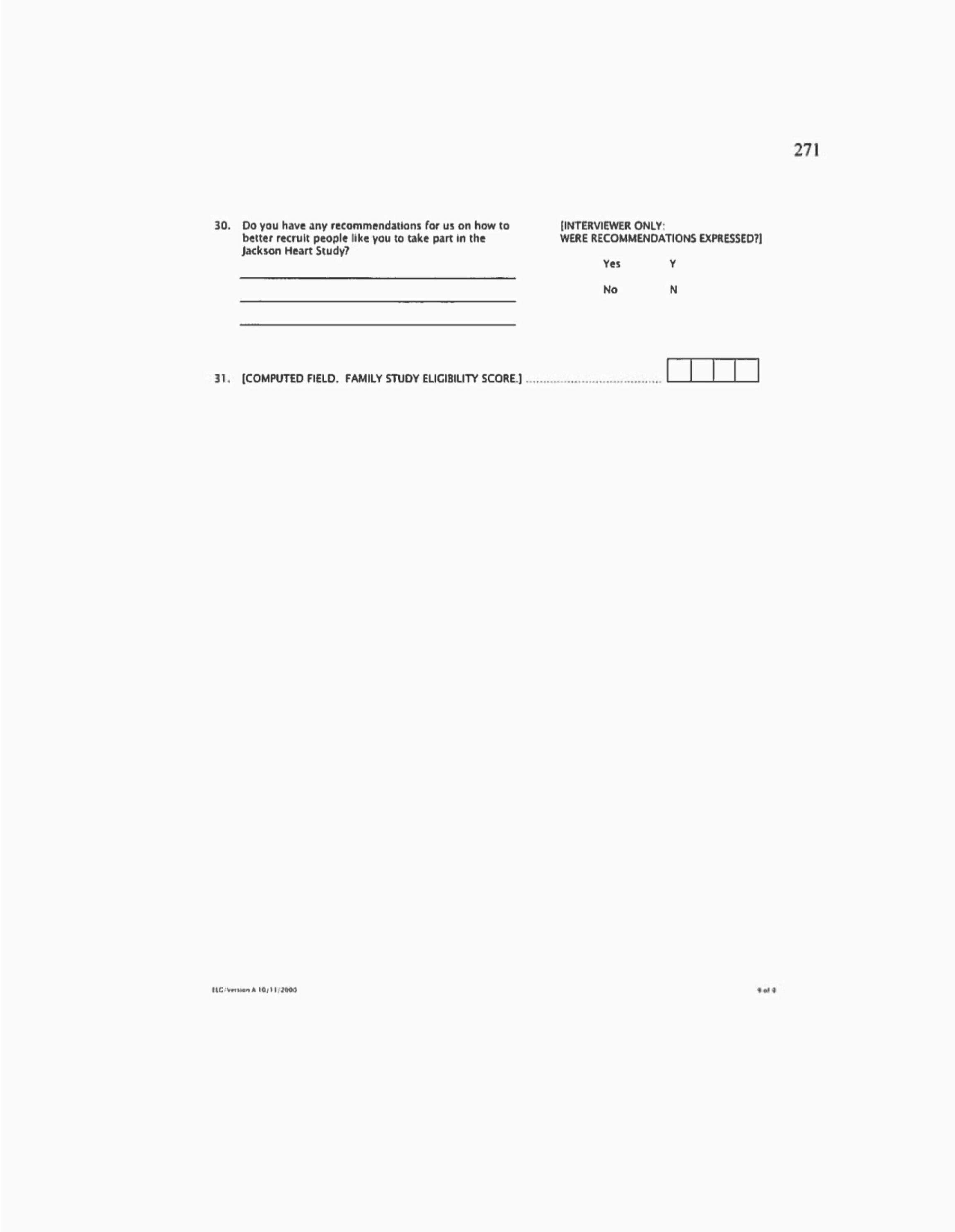
28. Some people have indicated that it would help to talk with others who have already taken part in research like the Jackson Heart Study. Would you like to have a volunteer who has taken part in another research study similar to the Jackson Heart Study call you to talk about what it is really like to be in a study?

	Yes	Y
Go to Item 30	No	N

29. Is there a particular day or time that would be best for you?

	Yes	No
29a. Weekday morning?	Y	N
29b. Weekday afternoon?	Y	N
29c. Weekday evening?	Y	N
29d. Week-end morning?	Y	N
29e. Week-end afternoon?	Y	N
29f. Week-end evening?	Y	N

29g. Specific day	Sunday	S
	Monday	M
	Tuesday	T
	Wednesday	W
	Thursday	H
	Friday	F
	Saturday	A
	Not indicated	N



30. **Do you have any recommendations for us on how to better recruit people like you to take part in the Jackson Heart Study?**

____

____

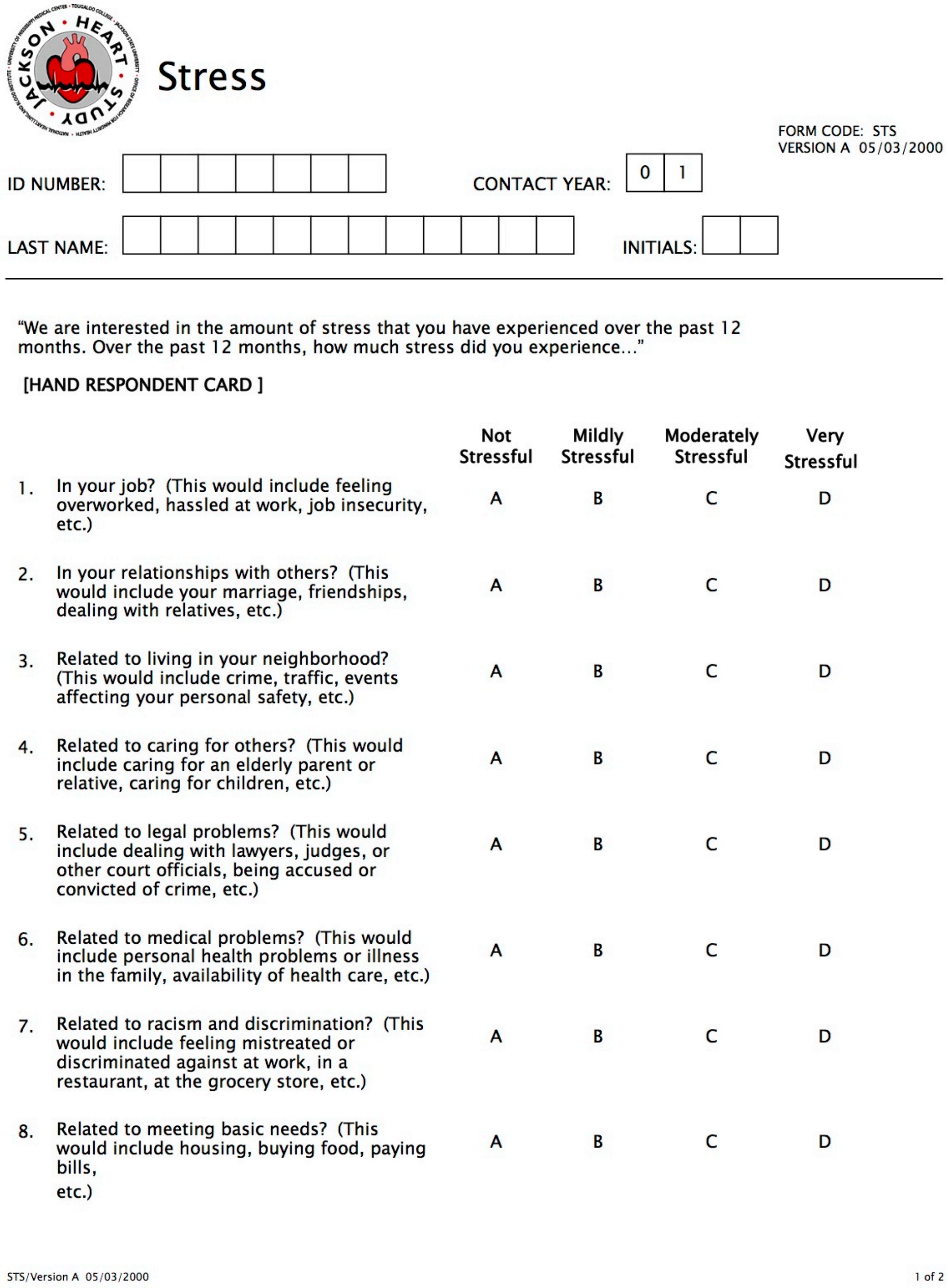
____

[INTERVIEWER ONLY:
WERE RECOMMENDATIONS EXPRESSED?]

Yes	**Y**
No	**N**

31. **[COMPUTED FIELD. FAMILY STUDY ELIGIBILITY SCORE.]** .... ☐☐☐☐

Appendix B: Stress Form (STSA)



Stress

FORM CODE: STS
VERSION A 05/03/2000

ID NUMBER: ☐☐☐☐☐☐☐ CONTACT YEAR: 0 1

LAST NAME: ☐☐☐☐☐☐☐☐☐☐☐☐ INITIALS: ☐☐

"We are interested in the amount of stress that you have experienced over the past 12 months. Over the past 12 months, how much stress did you experience…"

[HAND RESPONDENT CARD]

		Not Stressful	Mildly Stressful	Moderately Stressful	Very Stressful
1.	In your job? (This would include feeling overworked, hassled at work, job insecurity, etc.)	A	B	C	D
2.	In your relationships with others? (This would include your marriage, friendships, dealing with relatives, etc.)	A	B	C	D
3.	Related to living in your neighborhood? (This would include crime, traffic, events affecting your personal safety, etc.)	A	B	C	D
4.	Related to caring for others? (This would include caring for an elderly parent or relative, caring for children, etc.)	A	B	C	D
5.	Related to legal problems? (This would include dealing with lawyers, judges, or other court officials, being accused or convicted of crime, etc.)	A	B	C	D
6.	Related to medical problems? (This would include personal health problems or illness in the family, availability of health care, etc.)	A	B	C	D
7.	Related to racism and discrimination? (This would include feeling mistreated or discriminated against at work, in a restaurant, at the grocery store, etc.)	A	B	C	D
8.	Related to meeting basic needs? (This would include housing, buying food, paying bills, etc.)	A	B	C	D

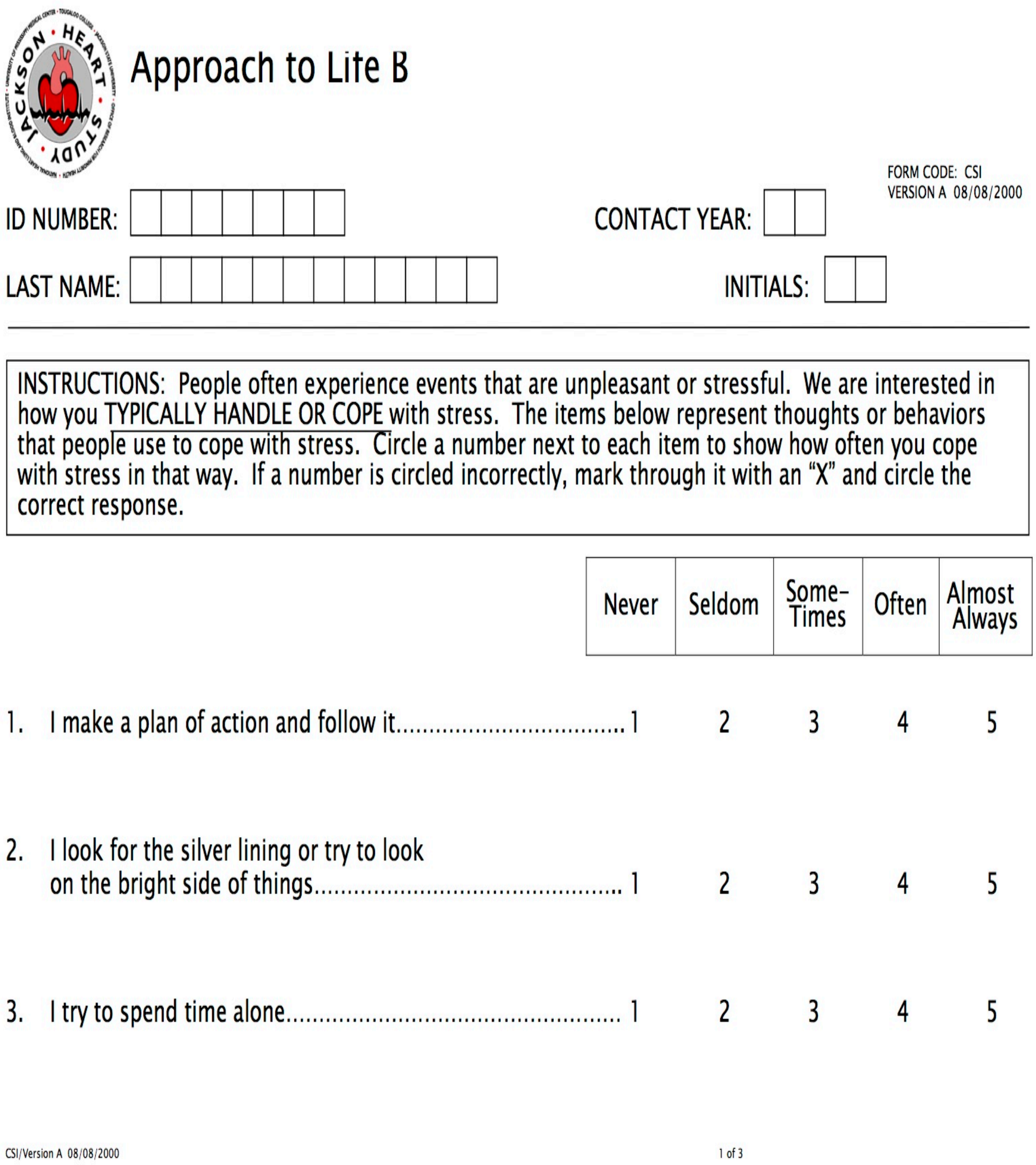
STS/Version A 05/03/2000 1 of 2

ADMINISTRATIVE INFORMATION

9. Date of data collection:..................... ☐☐/☐☐/☐☐☐☐
m m d d y y y y

10. Code number of person completing this form: .... ☐☐☐

Appendix C: Coping Form (CSIA)



Approach to Life B

FORM CODE: CSI
VERSION A 08/08/2000

ID NUMBER: ☐☐☐☐☐☐☐

CONTACT YEAR: ☐☐

LAST NAME: ☐☐☐☐☐☐☐☐☐☐☐☐

INITIALS: ☐☐

INSTRUCTIONS: People often experience events that are unpleasant or stressful. We are interested in how you TYPICALLY HANDLE OR COPE with stress. The items below represent thoughts or behaviors that people use to cope with stress. Circle a number next to each item to show how often you cope with stress in that way. If a number is circled incorrectly, mark through it with an "X" and circle the correct response.

	Never	Seldom	Some-Times	Often	Almost Always
1. I make a plan of action and follow it	1	2	3	4	5
2. I look for the silver lining or try to look on the bright side of things	1	2	3	4	5
3. I try to spend time alone	1	2	3	4	5

	Never	Seldom	Some-Times	Often	Almost Always
4. I hope the problem will take care of itself..........................	1	2	3	4	5
5. I try to let my emotions out...	1	2	3	4	5
6. I try to talk about it with a friend or family.......................	1	2	3	4	5
7. I try to put the problem out of my mind...........................	1	2	3	4	5
8. I tackle the problem head-on..	1	2	3	4	5
9. I step back from the situation and try to put things into perspective..	1	2	3	4	5
10. I tend to blame myself..	1	2	3	4	5

	Never	Seldom	Some-Times	Often	Almost Always
11. I let my feelings out to reduce the stress............................	1	2	3	4	5
12. I hope for a miracle...	1	2	3	4	5
13. I ask a close friend or relative that I respect for help or advice..	1	2	3	4	5
14. I try not to think about the problem:	1	2	3	4	5
15. I tend to criticize myself...	1	2	3	4	5
16. I keep my thoughts and feelings to myself.........................	1	2	3	4	5

FOR ADMINISTRATIVE USE ONLY

17. Date: ☐☐/☐☐/☐☐☐☐ (m m d d y y y y)

18. Administration (A,B,C,D) ☐

19. Code ☐☐☐

Appendix D: Social Support Form

Social Support Form

FORM CODE: SOC
VERSION A 09/20/2000

ID NUMBER: ☐☐☐☐☐☐☐

CONTACT YEAR: 0 1

LAST NAME: ☐☐☐☐☐☐☐☐☐☐☐☐

INITIALS: ☐☐

"Now I have some questions about your relationships with your family and others."

1a. First, are you married, separated, divorced, widowed or have you never been married? ....

Married	M	
Separated	S	
Divorced	D	
Widowed	W	
Never been married	N	Go to Item 2

1b. How long have you been (married, separated, divorced, widowed)? .... ☐☐ years

[0-6 months = 00
7-12 months = 01]

2. Are you currently living with your spouse or another person in an intimate relationship? ....

Yes	Y	
No	N	Go to Item 5

3. How much does (did) your (husband/wife/partner/person you live with) make you feel loved and cared for? Would you say a great deal, quite a bit, some, a little, or not at all? **[RC #1]** ....

A great deal	A
Quite a bit	B
Some	C
A little	D
Not at all	E

4. How much do you feel (he/she) (makes/made) too many demands on you? Would you say a great deal, quite a bit, some, a little, or not at all? **[RC #1]**

A great deal	A
Quite a bit	B
Some	C
A little	D
Not at all	E

5. How many close friends do you have (people you feel at ease with, can talk to about private matters, and can call on for help)? **[RC #2]**

None	A
1 or 2	B
3 to 5	C
6 to 9	D
10 or more	E

6. How many relatives do you have that you feel close to? **[RC #2]**

None	A
1 or 2	B
3 to 5	C
6 to 9	D
10 or more	E

7. How many of these friends or relatives do you see at least once per month? **[RC #2]**

None	A
1 or 2	B
3 to 5	C
6 to 9	D
10 or more	E

8a. Do you belong to any social, recreational, work, church or other community groups? (For example, social clubs, groups, ball clubs, exercise groups, PTA, scouts, charity or community service)

Yes	Y	
No	N	Go to Item 9

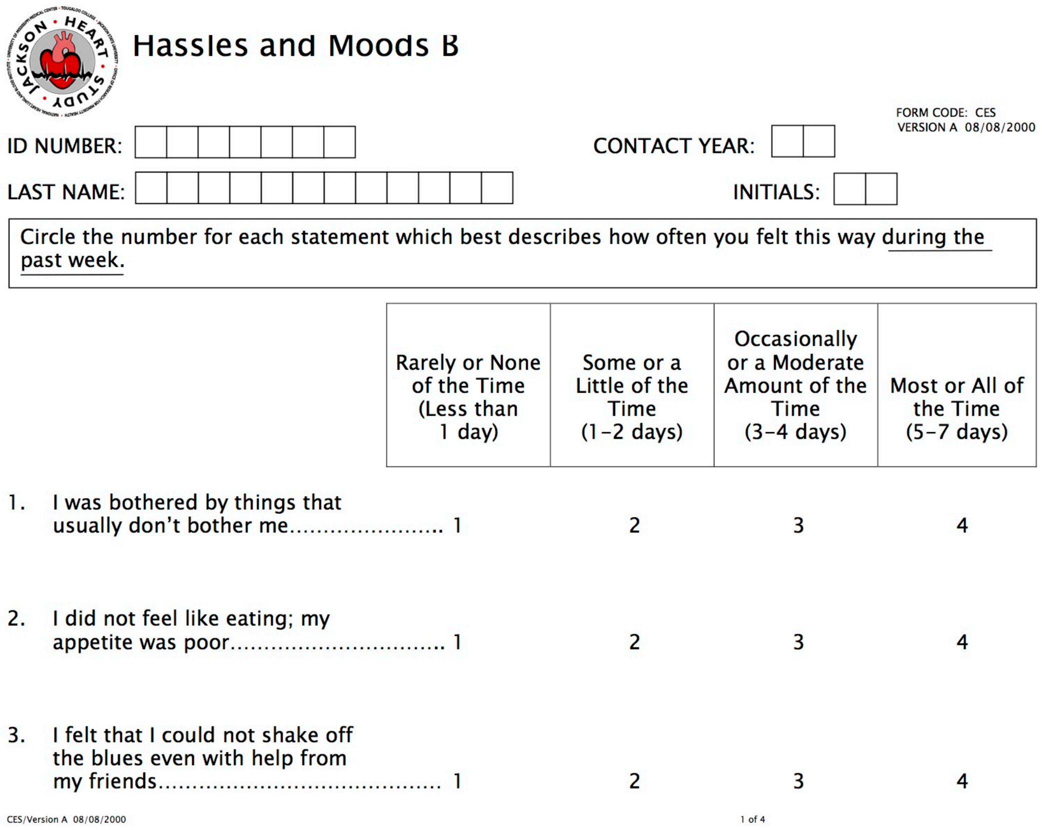
8b. What is the total number of groups to which you belong? ☐☐

ADMINISTRATIVE INFORMATION

9. Date of data collection: .... ☐☐/☐☐/☐☐☐☐ (m m / d d / y y y y)

10. Code number of person completing this form.................................... ☐☐☐

Appendix E: CES-D Form



Hassles and Moods B

FORM CODE: CES
VERSION A 08/08/2000

ID NUMBER: ☐☐☐☐☐☐☐

CONTACT YEAR: ☐☐

LAST NAME: ☐☐☐☐☐☐☐☐☐☐☐☐

INITIALS: ☐☐

Circle the number for each statement which best describes how often you felt this way <u>during the past week</u>.

	Rarely or None of the Time (Less than 1 day)	Some or a Little of the Time (1–2 days)	Occasionally or a Moderate Amount of the Time (3–4 days)	Most or All of the Time (5–7 days)
1. I was bothered by things that usually don't bother me………………….	1	2	3	4
2. I did not feel like eating; my appetite was poor………………………….	1	2	3	4
3. I felt that I could not shake off the blues even with help from my friends…………………………………….	1	2	3	4

CES/Version A 08/08/2000

1 of 4

	Rarely or None of the Time (Less than 1 day)	Some or a Little of the Time (1–2 days)	Occasionally or a Moderate Amount of the Time (3–4 days)	Most or All of the Time (5–7 days)
4. I felt that I was just as good as other people	1	2	3	4
5. I had trouble keeping my mind on what I was doing	1	2	3	4
6. I felt depressed	1	2	3	4
7. I felt that everything I did was an effort	1	2	3	4
8. I felt hopeful about the future	1	2	3	4
9. I thought my life had been a failure	1	2	3	4

	Rarely or None of the Time (Less than 1 day)	Some or a Little of the Time (1–2 days)	Occasionally or a Moderate Amount of the Time (3–4 days)	Most or All of the Time (5–7 days)
10. I felt fearful..	1	2	3	4
11. My sleep was restless..........................	1	2	3	4
12. I was happy..	1	2	3	4
13. I talked less than usual........................	1	2	3	4
14. I felt lonely...	1	2	3	4
15. People were unfriendly.........................	1	2	3	4
16. I enjoyed life......................................	1	2	3	4

	Rarely or None of the Time (Less than 1 day)	Some or a Little of the Time (1–2 days)	Occasionally or a Moderate Amount of the Time (3–4 days)	Most or All of the Time (5–7 days)
17. I had crying spells................................	1	2	3	4
18. I felt sad...	1	2	3	4
19. I felt that people disliked me...............	1	2	3	4
20. I could not get “going”.........................	1	2	3	4

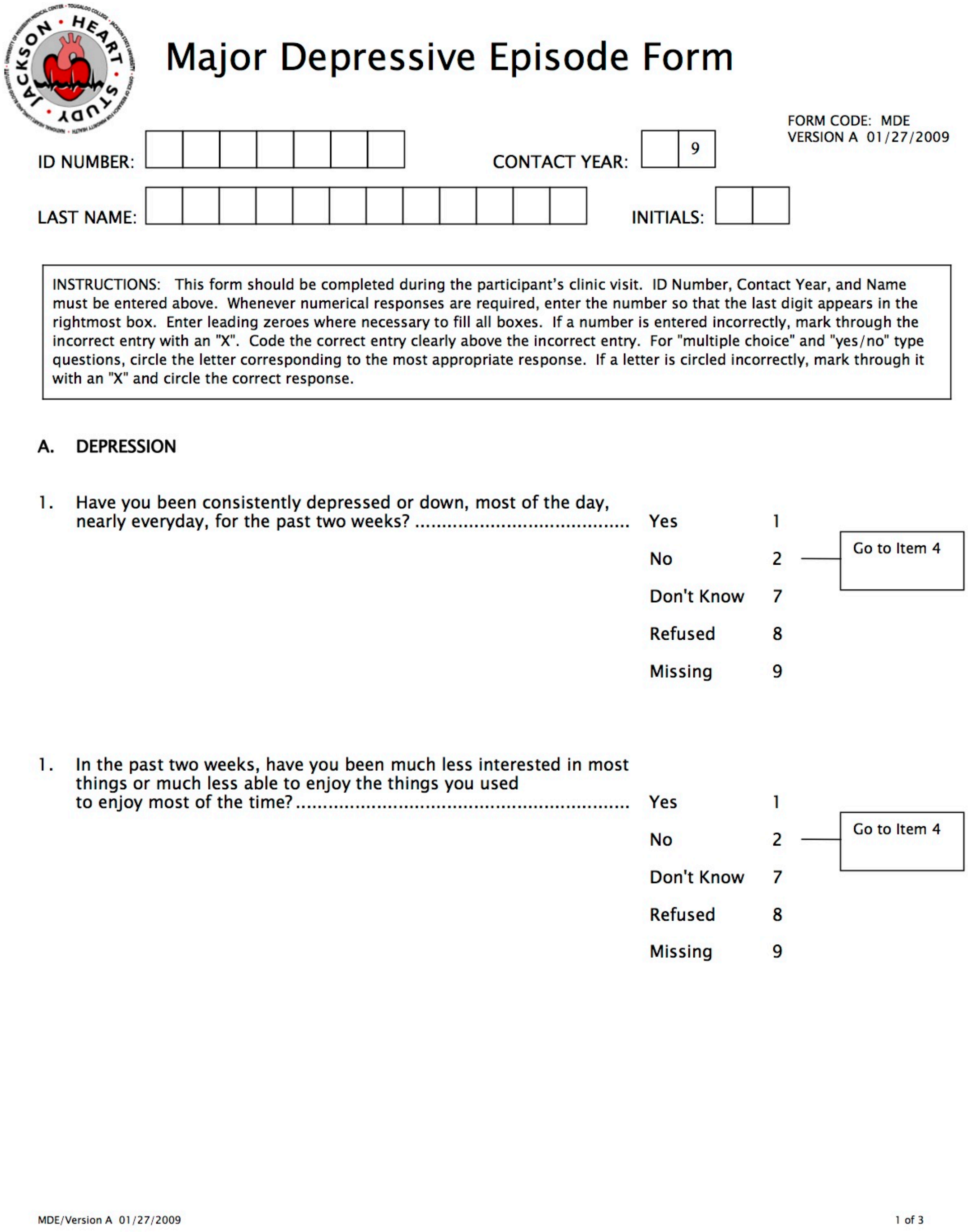
FOR ADMINISTRATIVE USE ONLY

21. Date: ☐☐/☐☐/☐☐☐☐ (m m d d y y y y)

22. Administration (A,B,C,D) ☐

23. Code ☐☐☐

Appendix F: Major Depressive Episode Form



Major Depressive Episode Form

FORM CODE: MDE
VERSION A 01/27/2009

ID NUMBER: ☐☐☐☐☐☐☐ CONTACT YEAR: ☐ 9

LAST NAME: ☐☐☐☐☐☐☐☐☐☐☐☐ INITIALS: ☐☐

INSTRUCTIONS: This form should be completed during the participant's clinic visit. ID Number, Contact Year, and Name must be entered above. Whenever numerical responses are required, enter the number so that the last digit appears in the rightmost box. Enter leading zeroes where necessary to fill all boxes. If a number is entered incorrectly, mark through the incorrect entry with an "X". Code the correct entry clearly above the incorrect entry. For "multiple choice" and "yes/no" type questions, circle the letter corresponding to the most appropriate response. If a letter is circled incorrectly, mark through it with an "X" and circle the correct response.

A. DEPRESSION

1. Have you been consistently depressed or down, most of the day, nearly everyday, for the past two weeks? ....

Yes	1	
No	2	Go to Item 4
Don't Know	7	
Refused	8	
Missing	9	

1. In the past two weeks, have you been much less interested in most things or much less able to enjoy the things you used to enjoy most of the time? ....

Yes	1	
No	2	Go to Item 4
Don't Know	7	
Refused	8	
Missing	9	

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		Yes	No	Don't Know	Refused	Missing
3.	Over the past two weeks, when you felt depressed or uninterested:					
3a.	Was your appetite decreased or increased nearly every day? Did your weight decrease or increase without trying intentionally (i.e., by ±5% of body weight or ±3.5% kgs., for a 160 lb./70 kg. person in a month)? **IF YES TO EITHER CODE YES**	1	2	7	8	9
3b.	Did you have trouble sleeping nearly every night (difficulty falling asleep, waking up in the middle of the night, early morning wakening or sleeping excessively)?	1	2	7	8	9
3c.	Did you talk or move more slowly than normal or were you fidgety, restless or having trouble sitting still almost every day?	1	2	7	8	9
3d.	Did you feel tired or without energy almost every day?	1	2	7	8	9
3e.	Did you feel worthless or guilty almost every day?	1	2	7	8	9
3f.	Did you have difficulty concentrating or making decisions almost every day?	1	2	7	8	9
3g.	Did you repeatedly consider hurting yourself, feel suicidal, or wish that you were dead?	1	2	7	8	9
	ARE 5 OR MORE ANSWERS (A1–A3) CODED YES?					

IF PATIENT HAS CURRENT MAJOR DEPRESSIVE EPISODE CONTINUE TO A4, OTHERWISE MOVE TO DYSTHYMIA

4. During your life time, did you have other periods of two weeks or more when you felt depressed or uninterested in most things, and had most of the problems we just talked about?...................................

Yes	1	
No	2	Go to Item 6
Don't Know	7	
Refused	8	
Missing	9	

5. Did you ever have an interval of at least 2 months without any depression and any loss of interest between 2 episodes of depression? ....

Yes	1
No	2
Don't Know	7
Refused	8
Missing	9

B. DYSTHYMIA

IF PATIENT'S SYMPTOMS CURRENTLY MEET CRITERIA FOR MAJOR DEPRESSIVE EPISODE, DO NOT EXPLORE THIS MODULE.

		Yes	No	Don't Know	Refused	Missing
6.	Have you felt sad, low or depressed most of the time for the last two years? **IF NO GO TO ITEM 9**	1	2	7	8	9
6a.	Was this period interrupted by your feelings OK for two months or more?	1	2	7	8	9
7.	During this period of feeling depressed most of the time:					
7a.	Did your appetite change significantly?	1	2	7	8	9
7b.	Did you have trouble sleeping or sleep excessively?	1	2	7	8	9
7c.	Did you feel tired or without energy?	1	2	7	8	9
7d.	Did you lose your self-confidence?	1	2	7	8	9
7e.	Did you have trouble concentrating or making decisions?	1	2	7	8	9
7f.	Did you feel hopeless?	1	2	7	8	9
8.	Did the symptoms of depression cause you significant distress or impair your ability to function at work, socially, or in some other important way?	1	2	7	8	9
	ARE 2 OR MORE ANSWERS CODED YES?					

ADMINISTRATIVE INFORMATION

9. Date of data collection: .... ☐☐/☐☐/☐☐☐☐
m m d d y y y y

10. Method of data collection: .... Computer 1
Paper form 2

11. Code number of person completing this form: .... ☐☐☐