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Racial Differences in Social Support and the Quality of Life Among Individuals with Chronic Illnesses

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RACIAL DIFFERENCES IN SOCIAL SUPPORT AND THE QUALITY OF LIFE AMONG INDIVIDUALS WITH CHRONIC ILLNESSES

By

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DEDICATION

This work is dedicated to all sources of support during my time at the University of Memphis School of Public Health. To my mother, father, and sister, thank you all for your constant prayers and for reminding that I can do all things through Christ who strengthens me. I love you more than you can ever know.

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ABSTRACT

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Previous studies have indicated that the association between social support and quality of life (QOL) among individuals with chronic illnesses differs by race, yet the specifics of these association are uncertain. The purpose of this dissertation was to examine racial differences in associations between factors of social support (i.e. sources of informal social support and positive/negative social support) and four QOL domains (i.e., physical well-being, psychological well-being, social well-being, and spiritual well-being) among individuals previously diagnosed with a chronic illness. The study was guided by three aims: 1) to examine common intrapersonal-level (e.g., stress, coping, and self-esteem) and interpersonal-level constructs (e.g., major discrimination, everyday discrimination, frequency of contact, social network ties, and social network size) as mediators and moderators, 2) to examine associations between sources of informal social support and QOL domains among individuals with chronic illnesses, and 3) to examine associations between sources of positive and negative social support and QOL domains among individuals with chronic illnesses. It is hypothesized the pattern of the associations between factors of social support and the four QOL domains will differ between individuals of African descent (i.e., African Americans and Caribbean Blacks) and non-Hispanic whites. Secondary data analyses of the National Survey of American Life (NSAL) were conducted. The sample was comprised of 3,285 African Americans, Caribbean Blacks, and non-Hispanic whites. Moderation was evaluated through interaction terms. Mediation was assessed through bootstrapping procedures. Multiple imputation analyses primarily assessed the racial differences between factors of social support and QOL domains. Stress and social ties consistently moderated and mediated the relationship between factors of social support and QOL domains. A

total of 10 of the 40 associations between factors of social support and QOL domains were moderated by race. In addition, the direction of 16 of the 40 associations between factors of social support and QOL domains indicated differences between individuals of African descent compared to non-Hispanic whites after stratifying the study sample by race. Future prospective longitudinal studies are needed to further assess the influence of social support and QOL domains among individuals of African descent and non-Hispanic whites with chronic illnesses.

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CHAPTER 1: INTRODUCTION

Chronic diseases are responsible for 70% of deaths in the United States and place a substantial financial burden on the American healthcare system ("Chronic Disease Overview," 2017). The treatment of chronic diseases accounts for 86% of the annual two trillion dollars spent on medical expenditures in the United States (Gerteis et al., 2014). Importantly, racial inequalities in chronic diseases contribute significantly to health-care expenditures (Lê Cook, McGuire, & Zuvekas, 2009; Rathore & Krumholz, 2004). The Joint Center for Economic and Political Studies estimated that eliminating racial health disparities could reduce approximately $230 billion dollars in medical care expenditures (LaVeist, Gaskin, & Richard, 2009).

African Americans have the highest percentage of excess medical expenditures (59%) compared to Asians and Hispanics (LaVeist et al., 2009). Individuals of African descent, which include African Americans and Caribbean Blacks, suffer disproportionately from a variety of chronic illnesses compared to whites including, but not limited to, hypertension (Chatterjee, Chattopadhya, Hope-Ross, & Lip, 2002), diabetes (Cowie et al., 2006), and cardiovascular disease (Roger et al., 2011). For example, Caribbean Blacks have a higher incidence of stroke when compared to whites (Ferguson & Tulloch-Reid, 2010). Also, deaths from chronic diseases are disproportionately higher among individuals of African descent compared to whites, including age-adjusted mortality from heart disease (211 per 100,000 persons among African Americans and 170 for whites) and cancer (194 per 100,000 persons among African Americans and 171 for whites) (Center for Disease Control and Prevention, 2014).

Quality of life (QOL), which measures an individual's perception of their well-being (Grip, Almqvist, Axberg, & Broberg, 2014; Megari, 2013), is associated with disease severity (Ståhl et al., 2005; Wu, Zhao, Chen, Fu, & Xu, 2015) and predicts chronic disease mortality

(Abbott et al., 2009; Meyer et al., 2009; Vigano et al., 2004). Not surprisingly, racial disparities are also present when assessing QOL among individuals with chronic illnesses (Matthews, Tejeda, Johnson, Berbaum, & Manfredi, 2012). Though reasons for these disparities are unclear; previous studies suggest that differences in socioeconomic status between African Americans and whites may account for differences in QOL (Farmer & Ferraro, 2005; Jackson et al., 2004). For example, a previous mixed methods study discovered that lower income African American women with metastatic breast cancer frequently reported factors that can negatively influence their QOL (i.e. social problems, increased physical distress, etc.) (Rosenzweig, Wiehagen, Brufsky, & Arnold, 2009).

Race has also been shown to differ in the association between social support and QOL among individuals with chronic illnesses (Matthews et al., 2012). For example, perceived social support from family, friends, and significant others were previously associated with higher psychological well-being scores among African-American cancer survivors (Matthews et al., 2012). Qualitative studies have also observed that perceived social support from family (Ashing-Giwa et al., 2004) and church members (Hamilton, Moore, Powe, Agarwal, & Martin, 2010) can play a key role in the health of individuals of African descent. Yet despite the influence of specific sources of social support on the health of individuals of African descent with chronic illnesses, research assessing the racial differences between sources of social support and QOL domains within this population is limited (Matthews et al., 2012).

Along with sources of social support, both positive and negative social support have been shown to play an influential role in the QOL of individuals of African descent with chronic illnesses (Tang, Brown, Funnell, & Anderson, 2008). A cross-sectional study, for example, observed that both positive and negative social support were associated with QOL among

African Americans with type-2 diabetes (Tang, Brown, Funnell, & Anderson, 2008). Within this study, positive and negative social support were assessed using the 16 item Diabetes Family Behavior Checklist-II (Schafer, McCaul, & Glasgow, 1986). An example of an item used to measure positive social support was “praise you for following your diet” (Schafer, McCaul, & Glasgow, 1986). Alternatively, an item designed to measure negative social support within this study was “criticized you for not exercising regularly” (Schafer, McCaul, & Glasgow, 1986).

Positive social support specifically is believed to have a positive influence on the QOL of the general population of individuals of African descent (Oates, 2016). Negative social support, however, is believed to be a barrier among individuals of African descent, who are attempting to engage in healthy lifestyle changes (Warren-Findlow & Prohaska, 2008). Currently no studies have assessed if both positive and negative social support may influence specific QOL domains among individuals of African descent. There is also limited research which assesses the racial differences between sources of positive and negative social support and the QOL among individuals with chronic illnesses. Such research limitations prevent investigators from acquiring a comprehensive understanding on how the QOL among individuals of African descent with chronic illnesses can be improved. Thus, this dissertation will examine racial differences in the associations between factors related to social support (i.e., sources of informal social support and positive/negative social support) and the QOL among individuals with chronic illnesses.

This dissertation will also examine common intrapersonal-level (e.g., stress, coping, and self-esteem) and interpersonal-level constructs (e.g., everyday discrimination, major discrimination, frequency of contact, social network ties, and social network size) as moderators and mediators within associations between factors of social support and QOL among individuals within chronic illnesses. Previous studies have suggested these variables may moderate (Berg,

2012; Fowler, 2017; Mroz et al., 2018) or mediate (Saltzman & Holahan, 2002; Zhou et al., 2010) the relationship between social support and QOL. However, no studies have attempted to assess the moderating and mediating effects of these variables on the association between factors of social support and QOL among individuals within chronic illnesses. By conducting moderation and mediation analyses, this study will provide further insight into the relationship between social support and QOL among individuals with chronic illnesses.

CHAPTER 2: LITERATURE REVIEW

This chapter is comprised of current studies related to QOL and social support among both chronically ill populations as well as individuals of African descent. A systematic search using several online databases (Google Scholar, PubMed, PsycInfo, and Medline) was employed to obtain articles that focused on factors of social support (i.e., sources of informal social support and positive/negative social support) as well as QOL among individuals with chronic illnesses. Articles were retrieved from these online databases using the following search terms and keywords: “quality of life”, “health-related quality of life”, “QOL”, “HRQOL”, “perceived social support”, “sources of social support”, “positive social support”, and “negative social support”. Citations for each study obtained during the literature review were also reviewed.

Racial Disparities in Chronic Illnesses

Approximately 117 million Americans suffer from a chronic illness (Ward, Schiller, & Goodman, 2014). Chronic illnesses are long-term medical conditions that can affect an individual’s normal activities and may require either hospitalization or frequent medical care (Mokkink, Van Der Lee, Grootenhuis, Offringa, & Heymans, 2008). Chronic illnesses can include, but are not limited to: heart disease, diabetes, arthritis, and cancer ("Chronic Disease Overview," 2017). Twenty five percent of Americans suffer from at least two or more chronic illnesses (Ward et al., 2014). Individuals of African descent have a substantially higher prevalence of chronic illnesses compared to other racial groups (Cowie et al., 2010; Rostand, 2010). The reason for the higher prevalence of specific chronic illnesses among individuals of African descent is currently unclear.

Quality of Life

Defining Quality of Life

QOL is considered a subjective evaluation of an individual's life (De Haes, 1988). QOL is a multifaceted construct that measures the perception of an individual's position in life through a variety of domains (WHOQOL Group, 1995). There is currently no universal definition for QOL (Barcaccia et al., 2013; Lavdaniti & Tsitsis, 2015), however, studies often use domains to define QOL (Ashing-Giwa, 2005; Bonnar & McCarthy, 2012; Montazeri, 2009; Strine, Chapman, Balluz, & Mokdad, 2008; Theofilou, 2013). The QOL domains can include, but are not limited to, physical well-being, social relationships, personal beliefs/spirituality, level of independence, and psychological well-being (WHOQOL Group, 1995).

There are a variety of advantages to assessing the quality of life (QOL) among individuals with chronic illnesses. QOL can indicate the quality of both positive and negative experiences among individuals (Eckert, 2012; WHOQOL Group, 1995). This in turn can allow for the evaluation of an individual's perception of disease-related symptoms and conditions (Hoedjes, 2011). QOL has been associated with the severity of an illness (Medinas Amoros et al., 2009; Moons, Van Deyk, De Geest, Gewillig, & Budts, 2005; Pidala et al., 2011), the subjective perception of an individual's wellbeing (Magallares, de Valle, Irles, & Jauregui-Lobera, 2014), and life satisfaction (Okulicz-Kozaryn, 2012). Such advantages may also provide evidence as to why QOL can be used to inform issues related to clinical care and health care policies (Blinderman, Homel, Billings, Portenoy, & Tennstedt, 2008). Furthermore, QOL has become an influential outcome measurement among individuals with chronic illnesses (Moons, Budts, & De Geest, 2006).

QOL vs. HRQOL: Health-related quality of life (HRQOL) can function as a measurement of an individual's QOL as well (Habraken et al., 2011; Mishra et al., 2009). Yet the concept of HRQOL is not as broad (Andersen, Wittrup-Jensen, Lolk, Andersen, & Kragh-Sørensen, 2004) and focuses specifically on the health status of an individual's QOL (Theunissen et al., 1998). HRQOL is often associated with factors specifically related to chronic illnesses such as functional capacity, depression, and disease activity (Cohen et al., 2006; Lix et al., 2008). Because QOL provides a broader assessment of an individual's well-being within a variety of domains (Davis et al., 2006; Kourkoutas, Georgiadi, & Plexousakis, 2010), the operationalization of this construct formed the sole measure of an individual's QOL within this study.

QOL Domains: There is currently a wide range of domains used to measure an individual's QOL. Such domains include, but are not limited to, physical well-being (designed to measure an individual's ability to carry out everyday tasks and/or assess their self-rated health status), psychological well-being (items measure anxiety, depression, and specific cognitive indicators), social well-being (focuses on items related to social support and an individual's social network), and emotional well-being (measures self-esteem and life satisfaction) (Bowling, 2001). These domains are considered to be relevant for measuring QOL among patients with chronic illnesses (Bowling, 2003). Yet, it is recognized that the items used to measure these domains can overlap or may not fully capture the QOL of an individual with a chronic illness (Bowling, 2003). Moreover, it has been suggested that additional domains are needed to thoroughly assess an individual's QOL (Bredle, Salsman, Debb, Arnold, & Cella, 2011; Kelly, 2013). Spiritual well-being (an individual's sense of meaning/purpose in life and their relationship with God) (Ellison & Smith, 1991), is considered to be an influential QOL domain among individuals with chronic

illnesses (Balboni et al., 2010; Bredle et al., 2011; Winkelman et al., 2011). Previous studies also observed that QOL domains may differ because of demographic characteristics of the study sample (Baumeister, Hahn, Bengel, & Härter, 2004; Bowen et al., 2007; Rao, Debb, Blitz, Choi, & Cella, 2008; Roth et al., 2011). However, additional research is needed to understand the cause of the demographic differences in QOL among individuals with chronic illnesses (Groessl, Ganiats, & Sarkin, 2006).

Differences in Quality of Life Domains within Certain Populations

QOL between Chronically Ill vs. Healthy Individuals: Individuals with chronic illnesses often report a lower QOL compared to healthy individuals (Dorian et al., 2009; Khan, McPhail, Brand, Turner-Stokes, & Kilpatrick, 2006; Padilla et al., 2008; Pressler et al., 2008; Von Ah et al., 2012). A cross-sectional study of 484 patients with atrial fibrillation, found that patients reported significantly lower QOL scores when compared to the scores of healthy control sample (Dorian et al., 2009). Differences between cancer survivors and healthy individuals have also been observed (Brandt et al., 2010; Mols et al., 2006; Zeltzer et al., 2008). For example, a retrospective longitudinal study observed that childhood cancer survivors reported significantly lower scores related to their physical well-being compared to their siblings (Zeltzer et al., 2008). While these studies provide examples of differences in QOL due to a chronic illness, the duration of the disease (Muszalik & Kędziora-Kornatowska, 2007) as well demographic characteristics such as race can also influence the QOL of chronically ill individuals (Han et al., 2011; Unruh et al., 2004).

Racial Differences: Race is an example of a demographic characteristic that is believed to influence some QOL domains of chronically ill individuals (Matthews et al., 2012; Quittner et al., 2010; Rao et al., 2008; Xie et al., 2006). However, the association between race and QOL among individuals with chronic illnesses is currently unclear (Edwards, Moric, Husfeldt,

Buvanendran, & Ivankovich, 2005; Ruehlman, Karoly, & Newton, 2005). Some studies have observed no racial differences in QOL among individuals with chronic illnesses (Ashing-Giwa, Ganz, & Petersen, 1999; Halbert et al., 2010; Mellon, Northouse, & Weiss, 2006), and other studies have observed that the QOL among individuals with chronic illnesses differs by race (Matthews et al., 2012; Xie et al., 2006).

Differences in specific QOL domains, are consistently observed among individuals of African descent compared to study participants of different demographic characteristics. Previous studies reported that individuals of African descent have significantly lower psychological well-being scores compared to other populations (Matthews et al., 2012; Reyes et al., 2017; Xie et al., 2006). In addition to this, a recent prospective longitudinal cohort study observed that African American colorectal cancer survivors displayed the worst physical and psychological well-being when compared to non-Hispanic whites, Hispanics, and Asian/Pacific Islanders (Reyes et al., 2017). Such findings demonstrate the necessity of examining racial differences in QOL domains among individuals with chronic illnesses.

Social Support

Defining Social Support

Perceived social support is the individual's perception that support is available from members of their social network should it be needed (Dunkel-Schetter & Skokan, 1990; Holt-Lunstad & Uchino, 2008). Previous studies have defined social support as global social support (summation score from different sources of social support) (Friedlander, Reid, Shupak, & Cribbie, 2007). By defining social support globally, researchers may minimize the importance of this concept and ignore how specific sources of support influence the health of certain populations (Demaray, Malecki, Jenkins, & Cunningham, 2010; Malecki & Demaray, 2003).

Moreover, this definition may also prevent researchers from thoroughly assessing how positive social support (i.e., feelings of acceptance an validation) (Sherman, Rosedale, & Haber, 2012) and negative social support (i.e., support that is unhelpful or unwanted) (Sherman, Rosedale, & Haber, 2012), potentially impacts the health of certain populations as well. Assessing perceived social support from various sources is important to determine how this important interpersonal resource may influence QOL (Fortin et al., 2006; Misra & Lager, 2008; Montazeri, 2008; Staniute, Brozaitiene, & Bunevicius, 2013). Several previous studies have shown that social support predicts QOL among individuals with chronic illnesses (Pettersen, Dahl, & Wyller, 2002; Tang, Aaronson, & Forbes, 2004; Warner, Schüz, Wurm, Ziegelmann, & Tesch-Römer, 2010).

Functional Components of Social Support

Global social support is designed to measure an individual's perception of the availability of functional components of support (Bowen et al., 2013). These functional components have been categorized into six functions or types of support provided by members of an individual's social network: received support, perceived support, informational support, instrumental/tangible support, belonging support, and emotional support (Cohen, Mermelstein, Kamarck, & Hoberman, 1985). When compared to structural components (number of social relationships or size of social network) (Cohen, 1988), functional components of social support displayed a stronger influence on the health of individuals with chronic illnesses (Barth, Schneider, & von Känel, 2010; Sultan et al., 2004; Thoits, 2011). Functional components of social support were therefore the primary focus of this study.

Received and Perceived Social Support: Functional components of social support can be conceptualized as either received or perceived from a member of an individual's social network

(Dunkel-Schetter & Skokan, 1990). Received social support is the amount of support actually provided by a member of an individual's social network (Dunkel-Schetter & Skokan, 1990; Holt-Lunstad & Uchino, 2008).

Received and perceived social support have similar influences on certain health outcomes. For example, previous studies demonstrated that received (Arora et al., 2007; Boehmer, Luszczynska, & Schwarzer, 2007) and perceived social support (Kroenke et al., 2013; Leung, Pachana, & McLaughlin, 2014; Matthews et al., 2012) can positively influence the QOL of individuals with chronic illnesses. Both received and perceived social support have been shown to be protective against chronic illnesses such as diabetes, heart disease, cancer, and arthritis (Wills, Ainette, Baum, Revenson, & Singer, 2012).

However, more favorable effects on health outcomes have been observed for perceived social support (Lakey, 2010; Uchino, 2009). Compared to perceived social support, received social support has been associated with more negative influences on certain QOL domains (Bolger & Amarel, 2007; Lepore, Glaser, & Roberts, 2008; Uchino, 2009). One explanation for the negative influences associated with received social support is its threat to an individual's autonomy (Smith & Goodnow, 1999; Uchino, 2009) and self-esteem (Bolger, Zuckerman, & Kessler, 2000; Uchino, 2009). Moreover, researchers believe that received social support may not be as beneficial as perceived social support because received social support is situational and often needed during stressful situations (Barrera, 2000; Uchino, 2009). The provision of this type of support has been associated with a reduction in self-esteem and independence among individuals experiencing a stressful situation (Bolger et al., 2000; Matire, Stephens, Druley, & Wojno, 2002). Alternatively, perceived social support is considered to be a more powerful influence in terms of reducing (Cohen & Wills, 1985; Prati & Pietrantoni, 2010) and adjusting to

stress (Bonanno et al., 2008). Perceived social support is also positively associated with improved overall QOL (Sammarco, 2001, 2003) as well as the physical and psychological well-being of individuals with chronic illnesses (Uchino, 2009).

Additional Types of Social Support: There are four types of perceived social support: belonging (a sense of cohesiveness among members of an individual's social network), instrumental/tangible (the provision of practical assistance or material resources), informational (the provision of helpful guidance/advice from a member of an individual's social network), and emotional (feelings of comfort and care) (Cohen et al., 1985). Each of these types of social support has been shown to positively influence certain health outcomes such as stress reduction (Dinenberg, McCaslin, Bates, & Cohen, 2014; Manuel, Martinson, Bledsoe-Mansori, & Bellamy, 2012; McClelland & McCubbin, 2008; Olstad, Sexton, & Søgaard, 2001). Specifically among individuals with chronic illnesses, different types of social support were associated with the adoption of healthy lifestyle behaviors, medication adherence (Strom & Egede, 2012), and QOL improvement (Huang & Hsu, 2013; Ibrahim, Teo, Din, Gafor, & Ismail, 2015; Kroenke et al., 2013; Lim, Yi, & Zebrack, 2008; Sultan et al., 2004).

Of these four types of social support, emotional support (feelings of comfort and care) (Cohen et al., 1985), is believed to be the most important as it exhibits the strongest link to an individual's overall QOL (Helgeson, 2003; House, 1985; House, 1981; Stansfeld, Shipley, Head, Fuhrer, & Kivimaki, 2013). Emotional social support has been associated with improved psychological (Segrin, Badger, & Pasvogel, 2015) and emotional well-being (Namkoong et al., 2010) of individuals within chronic illnesses. Emotional social support has also been shown to be a significant predictor of the health of African American women who are encountering a stressful life event (Israel, Farquhar, Schulz, James, & Parker, 2002). Moreover, the promotion of

emotional support is encouraged as a means of preventing poor QOL among individuals with chronic illnesses (Bellardita et al., 2013). Based on the benefits of assessing emotional support among individuals with chronic illnesses, this type of support was the primary type of social support assessed within this study.

Sources of Social Support

Formal sources of social support include healthcare providers and human service workers (Heaney & Israel, 2008), while informal support sources include family members, friends, significant others (Ansara & Hindin, 2010; Baker, 2013; Thoits, 1995), and fellow church members (Taylor & Chatters, 1988). Informal sources of social support have consistently played an influential role on the health of individuals with chronic illnesses (Carpenter, Fowler, Maxwell, & Andersen, 2010; Helgeson, Siminerio, Escobar, & Becker, 2008; Tremolada, Bonichini, & Taverna, 2016). Support from family (i.e. children, spouses, parents, etc.) (Tremolada et al., 2016; Zebrack, Mills, & Weitzman, 2007), friends (Carpenter et al., 2010; Helgeson et al., 2008), church members (Debnam, Holt, Clark, Roth, & Southward, 2012), and significant others (Hann et al., 2002) are just a few examples of different sources of social support that have been shown to influence the health of individuals with chronic illnesses. This study primarily focused on informal sources of social support.

Of the informal sources of support, support from family (Gremore et al., 2011; Tremolada et al., 2016; Zebrack et al., 2007) and friends (Carpenter et al., 2010) is considered to be a highly influential source of social support among individuals with chronic illnesses. Additionally, positive social support from both family and friends can have a positive influence on the QOL among individuals with chronic illnesses (Manning-Walsh, 2005). However, no

studies to date have assessed the relationship between sources of both positive and negative informal social support and the QOL domains among individuals with chronic illnesses.

Positive and Negative Social Support

Social support is often conceptualized as being positive and having a beneficial impact on an individual's QOL (Cohen & Wills, 1985; Koivula, Paunonen-Ilmonen, Tarkka, Tarkka, & Laippala, 2002). However, there is a growing body of literature which suggests that social support can also have a negative influence on an individual's QOL (Croezen et al., 2012; Erving, 2018). Moreover, studies have recently begun to conduct separate analyses for concepts of both positive and negative social support (Homma et al., 2016; Nickerson et al., 2017; Panchang, Dowdy, Kimbro, & Gorman, 2016).

There is no widely used definition for either positive or negative social support; however, this dichotomy is most often discussed in relationship with perceived social support (Al-Sheikh & Thabet, 2017; Nickerson et al., 2017). It is believed that positive perceived social support is based on feelings of acceptance and validation (Sherman, Rosedale, & Haber, 2012). Negative social support is support from members of an individual's social network that is unhelpful or unwanted (Sherman, Rosedale, & Haber, 2012). Negative social support is also believed to be related to negative social interactions (Ray, 1992). Both positive and negative social support have been shown to be associated with an individual's QOL (Rook, 2001). More specifically, positive social support has been associated with QOL improvements (Kroenke et al., 2013). Alternatively, negative social support has been shown to have a negative influence on both the QOL (Rini, Symes, Campo, Wu, & Austin, 2015) as well as the survival of individuals with chronic illnesses (Frick, Motzke, Fischer, Busch, & Bumeder, 2005).

Previous studies have mainly explored the associations between both positive and negative social support and specific health behaviors among individuals with chronic illnesses (Dulfer et al., 2015; Ponzo et al., 2006; Short et al., 2014). Using the Family Support for Heart Healthy Eating Habits Scale (Sallis, Grossman, Pinski, Patterson, & Nader, 1987), a cross-sectional study explored the association for both positive and negative social support and diabetes self-management behaviors among men and women with type 2 diabetes (Ponzo et al., 2006). The findings from this study revealed that negative social support from family (or sabotage), was negatively associated with diabetes self-management (Ponzo et al., 2006). While this study provides evidence of the association between negative social support and specific health outcomes among individuals with chronic illnesses, little if any research has been conducted that compares the relationships between both positive and negative social support and the QOL of an individual with chronic illnesses.

Gaps within the Existing Literature

Intrapersonal-level and Interpersonal-level Constructs: Social support has previously been shown to be associated with intrapersonal-level constructs, such as stress (Plant & Sachs-Ericsson, 2004), coping (Karlsen, Idsoe, Hanestad, Murberg, & Bru, 2004), and self-esteem (Stewart & Yuen, 2011), among individuals of African descent. These intrapersonal-level constructs have been shown to moderate the relationship between social support and QOL (Jacobsen et al., 2002; Mroz et al., 2018; Uchino, 2004). In addition to this, studies have also observed a mediating effect of these intrapersonal-level constructs between factors of social support and QOL (DuBois et al., 2002; Saltzman & Holahan, 2002; Symister & Friend, 2003; Zhou et al., 2010).

Past studies have also suggested that interpersonal-level constructs such as discrimination and social network factors (i.e. social network size, frequency of contact with informal sources,

and social network ties), are capable of moderating the relationship between factors of social support and QOL (Berg, 2012; Fowler, 2017). However, these studies do not assess if both the intrapersonal-level and interpersonal-level constructs potentially moderate or mediate the relationship between factors of social support and the QOL among individuals of African descent with chronic illnesses. By addressing this gap within the literature, future researchers can obtain a better understanding of the role that intrapersonal-level and interpersonal-level constructs play between factors of social support and the QOL among individuals with chronic illnesses. Moreover, the assessment of these constructs as potential moderators and mediators, may provide insight regarding how third variables influence the associations between factors of social support and the QOL among individuals of African descent with chronic illness (Baron & Kenny, 1986; MacKinnon, Fairchild, & Fritz, 2007).

Informal Sources of Social Support: Examining different sources of informal social support can provide future researchers with a better understanding of an individual's social network (Taylor, Chatters, Woodward, & Brown, 2013). Previous studies have examined if racial differences are observed within different sources of informal social support (Sarkisian & Gerstel, 2004; Taylor et al., 2013). A cross-sectional study, for example, observed that support from church members was significantly higher among African Americans compared to non-Hispanic whites and Caribbean Blacks (Taylor et al., 2013). This same study also observed that support from both fictive kin (i.e., individuals with a family-like relationship but are not related by blood or marriage) (Allen, 2016) and friends were significantly greater among non-Hispanic whites compared to African Americans and Caribbean Blacks (Taylor et al., 2013). However, this study did not assess the racial differences between informal sources of social support and QOL domains among individuals with chronic illnesses. Given the fact that different sources of

informal social support can have varying effects on an individual's health (Uchino, 2009), this study will provide insight on the potential varying associations between informal sources of social support and the QOL domains among a racially diverse population of individuals with chronic illnesses.

Positive and Negative Social Support: This study also seeks to address the existing gaps within the literature by investigating the racial differences in informal sources of both positive and negative social support and how they relate to specific QOL domains among individuals previously diagnosed with a chronic illness. Previous studies have observed racial differences for positive social support (Krause, 2002) and negative social support from church members (Lincoln, Chatters, & Taylor, 2013). For example, individuals of African descent, who were 55 years or older, displayed more negative social support from church members compared to non-Hispanic whites (Lincoln et al., 2013). However, this study did not assess the relationship between different informal sources of positive and negative social support and the QOL domains among individuals with chronic illnesses. Through this assessment, this study will encourage future researchers to recognize the importance of both positive and negative social support on the QOL among individuals with chronic illnesses.

Significance of the Dissertation

This study contributes to the literature by being one of the first studies to go beyond global social support (summation score from different sources of social support) (Friedlander et al., 2007), measuring instead the associations between specific factors of social support and four domains of QOL (physical well-being, psychological well-being, social well-being, and spiritual well-being) among individuals of African descent (i.e., African Americans and Caribbean Blacks). Social support (Clark, Hicks, Keogh, Epstein, & Ayanian, 2008) and QOL (Bowen et

al., 2007; Matthews et al., 2012) have been shown to differ among racial populations previously diagnosed with a chronic illness. However, African Americans and Caribbean Blacks have comprised a small percentage of the study sample among studies focused on associations between social support and QOL of individuals diagnosed with a chronic illness (Chung, Moser, Lennie, & Frazier, 2013; Ingerski, Janicke, & Silverstein, 2007; Misra & Lager, 2009; Moradkhani, Beckman, & Tabibian, 2013; Sammarco, 2009).

Among individuals of African descent with chronic illnesses, few studies include Caribbean Blacks (Pedersen, Armes, & Ream, 2012). Even with the recent growth of Caribbean Blacks within the U.S., studies continue to conceal the racial group of Caribbean Blacks by grouping this population within the term "Black American" (Taylor et al., 2013). Choosing not to separate Caribbean Blacks into their own racial group is unfortunate, as certain mental health disorders are more prevalent among Caribbean Blacks than whites (Neighbors et al., 2007; Williams et al., 2007). This in turn may negatively influence QOL within this population (Eack & Newhill, 2007).

Research on the influence of social support among Caribbean Blacks is also underdeveloped (Lincoln, Taylor, & Chatters, 2013). Few studies have assessed the role of specific factors of social support (i.e., sources of social support or positive and negative social support) among Caribbean Blacks specifically (Chatters, Taylor, Lincoln, Nguyen, & Joe, 2011; Lincoln & Chae, 2012; Lincoln et al., 2013). It is suggested that support from family and friends can play a key role in the QOL among both African Americans (Lincoln et al., 2013) and Caribbean Blacks (Levine, Taylor, Nguyen, Chatters, & Himle, 2015). Moreover, a cross-sectional study found there were no significant differences between Caribbean Blacks and African Americans for both positive and negative emotional support (Lincoln et al., 2013). Such findings suggest factors of

social support may be similar among individuals of African descent, although the number of studies able to examine both Caribbean Blacks and African Americans are limited in number. In addition, these studies have not assessed how factors of social support may differ between individuals of African descent and non-Hispanic whites with chronic illnesses. Moreover, the racial differences between factors of social support and the QOL among individuals with chronic illnesses were also not assessed within these studies.

Such limitations are cause for additional research to assess how specific factors of social support may influence the QOL for individuals of African descent compared to non-Hispanic whites. By assessing the associations between factors of social support and QOL domains among both African Americans and Caribbean Blacks, this study will assess if the relationship between these variables are similar among these two racial groups. Such findings may motivate future researchers to incorporate specific factors of social support when implementing interventions designed to improve the QOL among both Caribbean Blacks and African Americans. Moreover, findings from this study will provide future researchers with a better understanding of the specific factors of social support that may play a key role in improving the QOL among individuals of African descent with chronic illnesses. Lastly, this study's findings may encourage future studies to incorporate specific factors of social support as a means of reducing the prevalence of chronic illnesses among individuals of African descent.

Purpose of dissertation and study aims and hypotheses

The purpose of this dissertation is to examine racial differences between factors of social support (i.e., informal sources of social support as well as positive and negative social support) and four QOL domains (physical well-being, psychological well-being, social well-being, and

spiritual well-being) among individuals previously diagnosed with a chronic illness. The purpose of this dissertation was assessed through the following three study aims:

Study Aim 1: To examine common intrapersonal-level and interpersonal-level constructs as moderators and mediators.

Study Aim 2: To examine associations between sources of informal social support and QOL domains among individuals with chronic illnesses.

Hypothesis for Study Aim 2: Racial differences will exist across informal sources of social support and their associations with the four QOL domains and overall QOL. Specifically, it is hypothesized the pattern of the associations between informal sources of social support and the four QOL domains will differ between individuals of African descent (i.e., African Americans and Caribbean Blacks) and non-Hispanic whites.

Study Aim 3: To examine associations between informal sources of positive and negative social support and QOL domains among individuals with chronic illnesses.

Hypothesis for Study Aim 3: Racial differences will exist across informal sources of positive and negative social support and the associations with the four QOL domains and overall QOL. Specifically, it is hypothesized the pattern of the associations between informal sources of positive and negative social support social support and the four QOL domains will differ between individuals of African descent (i.e., African Americans and Caribbean Blacks) and non-Hispanic whites.

Rationale for the Purpose of the Study

This study was guided by the concept of social support (Cobb, 1976; Cohen & Wills, 1985; Holt-Lunstad & Uchino, 2008). This concept suggests that different types of support (i.e., informational, instrumental, belonging, and emotional) influence a variety of health outcomes

(Cohen & Wills, 1985; Holt-Lunstad & Uchino, 2008). Previous studies have also observed that social support can improve specific QOL domains such as psychological well-being (Graven & Grant, 2013) and physical well-being (Campbell, 2007; Kroenke, Kubzansky, Schernhammer, Holmes, & Kawachi, 2006). As a result, the concept of social support would suggest that informal sources of social support as well as both positive and negative social support can influence specific QOL domains among individuals with chronic illnesses.

CHAPTER 3: METHODS

Data Source and Sampling

This study is a secondary analysis of the National Survey of American Life: Coping with Stress in the 21st Century (NSAL) study (Jackson et al., 2004). The sampling design methods, study procedures, and protocol used to collect the data for the NSAL study have been published previously (Heeringa et al., 2004; Jackson, Neighbors, Nesse, Trierweiler, & Torres, 2004; Jackson et al., 2004). The purpose of the NSAL study was to explore racial and ethnic differences in psychological distress, mental illnesses, and potential risks and protective effects of informal and formal service use among African American and Caribbean Blacks compared to non-Hispanic whites (Alegria, Jackson, Kessler, & Takeuchi, 2008).

The NSAL is a nationally representative study of individuals of African descent (i.e. African American and Caribbean Blacks). The age range of the NSAL study participants was 18-94 years of age (Taylor, Caldwell, Baser, Faison, & Jackson, 2007). African Americans were the primary sample of the NSAL study, comprising 64 primary sampling units (PSUs). The NSAL also contains the first nationally representative sample of Caribbean Blacks (Woodward, Taylor, Abelson, & Matusko, 2013). Caribbean Blacks were selected from the core sampling component of the study as well as housing units containing a high density of individuals who identify as having Caribbean ancestry (Heeringa et al., 2004). This study contains a national sample of non-Hispanic whites residing within geographical areas containing at least 10% of the African American population (Heeringa et al., 2004). The NSAL also includes weights designed to correct disproportionate sampling as well as allow for comparative analyses given the complexity of the NSAL design characteristics (Heeringa et al., 2004).

Data Collection

Data collection for NSAL began in February 2001 and lasted until June 2003. Face-to-face interviews were used to collect 86% of the data using computer assisted personal interviewing software (CAPI). Each face-to-face interview took place in the participant's home and lasted approximately 2 hours and 20 minutes. The remaining 14% of the data were collected via phone interviews. All interviews were conducted by trained interviewers affiliated with the Institute for Social Research at the University of Michigan (Jackson et al., 2004). The overall response rate for the participants involved in this study was 72.3% (70.7% for African Americans, 77.7% for Caribbean Blacks, and 69.7% for non-Hispanic whites) (Jackson et al., 2004). Each participant was provided $50 as compensation for their involvement in the study (Jackson et al., 2004). All original data collection procedures were approved by the Institutional Review Board of the University of Michigan (Pennell et al., 2004). Data analyses procedures for this study, have been reviewed by the Institutional Review Board of the University of Memphis and deemed not to need approval.

Study Participants

Eligibility Criteria

Participants were considered eligible for NSAL if they: 1) were able to speak English, 2) identified as being non-institutionalized adults (Taylor, Forsythe-Brown, Taylor, & Chatters, 2014), 3) resided in one of the 48 states in the U.S., 4) and self-identified as being either African American, Caribbean Black, or non-Hispanic white. Study participants, who self-identified as being both Black and not having any Caribbean ancestral ties, were categorized as being African American (Joe, Baser, Neighbors, Caldwell, & Jackson, 2009). Participants were categorized as Caribbean Blacks, if they met the following criteria: 1) self-identified as Black, 2) indicated that

either they or their parents/grandparents were originally from a Caribbean-area country, and/or 3) self-identified as being of either West Indian or Caribbean descent (Jackson et al., 2004). A total of 6,082 interviews were conducted among the three racial groups (3,570 among African Americans, 1,621 among Caribbean Blacks, and 891 among non-Hispanic whites) (Taylor, Chatters, & Jackson, 2007).

For this study, the study sample consisted of individuals who answered "yes" to being told by a health professional that they have at least one of the following fifteen chronic illnesses: chronic lung disease, diabetes, sickle cell disease, glaucoma, osteoporosis, heart trouble, cancer, asthma, liver problem, high blood pressure, arthritis, ulcers, blood circulation problems, stroke, or kidney problems. These chronic illnesses were selected after reviewing previous studies that classified these conditions as chronic illnesses within racially diverse populations (Clarke & Currie, 2009; Vogeli et al., 2007) including studies examining the health of both African Americans and Caribbean Blacks (Assari, 2014; Griffith, Johnson, Zhang, Neighbors, & Jackson, 2011). Self-reported physicians' diagnoses of specific chronic illnesses have also been shown to agree with individuals' medical records (Voaklander, Thommasen, & Michalos, 2006). Based on these findings, self-reported physician diagnoses, were used to determine the chronic illness status of study participants. Study participants who provided no response or indicated that they had no previous diagnosis of any of the fifteen chronic illnesses were excluded from the current study's analyses (n=2,797).

Measures

The NSAL contains a total of 3,031 variables. Items for both the factors of social support (Broadhead, Gehlbach, De Gruy, & Kaplan, 1988; Schuster, Kessler, & Aseltine, 1990; Sherbourne & Stewart, 1991; Zimet, Dahlem, Zimet, & Farley, 1988) and the QOL domains

(Ferrell, Grant, Padilla, Vemuri, & Rhiner, 1991) were selected after reviewing the literature. Items were also selected if they aligned with items found within reliable and valid scales previously used by researchers to measure similar constructs. The specific items that were chosen for each construct are described in detail below.

Quality of Life Domains (Dependent Measures)

The operationalization of the QOL domains within this study was guided by the conceptual model of QOL proposed by Ferrell and colleagues (Ferrell, Grant, Padilla, Vemuri, & Rhiner, 1991). While there are a variety of psychometrically sound instruments that are designed to assess the QOL of individuals with chronic illnesses (Cella, 1997; Ferrans, 1990; Ware & Sherbourne, 1992), these instruments do not allow for an individual assessment of an individual's spiritual well-being. As a result, Ferrell's conceptual model is beneficial as it assesses an individual's physical, psychological, social, and spiritual well-being. Moreover, Ferrell's conceptual model has been used to assess the QOL of individuals suffering from a variety of chronic illnesses (Cranford & King, 2011; Quittner, Cruz, Modi, & Marciel, 2009; Von Ah, Russell, Storniolo, & Carpenter, 2009).

After conducting the principal component factor analysis on the psychological well-being and social well-being QOL domains, a total of 11 items in the NSAL dataset were used to assess the four QOL domains (i.e., physical well-being, psychological well-being, social well-being, and spiritual well-being). Items related to the four QOL domains were selected due to their similarity to items found in psychometrically sound instruments used to assess the QOL of individuals previously diagnosed with a chronic illness (i.e., the Quality of Life Cancer Survivor scale (Ferrell, Dow, & Grant, 1995) and the Functional Assessment of Chronic Illness Therapy-Spiritual Well-being Scale (FACIT-Sp) (Peterman, Fitchett, Brady, Hernandez, & Cella, 2002)).

Scores for each item were summed to provide a QOL domain score. All QOL domain scores were then summed to obtain an overall QOL score for each study participant.

All missing responses and responses coded as either a "-9" or an "-8" were recoded as missing. The method of coding missing responses was also implemented for each variable assessed within this study and replicates the coding of missing responses used during the initial development of the NSAL dataset (Pennell et al., 2004). The items and response options used to examine each of the QOL domains are in Table 1.

Social Support (Independent Measures)

Sources of Social Support: Four items in the NSAL dataset focused on the perception of support from different informal sources. These items related to the frequency in which a church member, family member, friend, or fictive kin helped the study participant. These items were selected to measure sources of social support due to their similarity to items found in valid and reliable social support scales (i.e., the Medical Outcomes Study (MOS) Social Support Survey (Sherbourne & Stewart, 1991), the Duke-UNC Functional Social Support Questionnaire (Broadhead et al., 1988), and the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988)). Responses for these items were based on a five-point categorical scale: 1-very often, 2-fairly often, 3-not too often, 4-never, and 5-never needed help. These categories were collapsed and recoded into three responses (1-never needed help/never/not too often, 2-fairly often, and 3-very often) based on the coding methods from a previous study using NSAL data (Mouzon, 2010). With the recoded responses, higher scores indicate more frequent support from a particular source. Items either without a response or coded as -9 or -8, were also coded as missing. The items and response options used to examine sources of social support are in Table 2.

Positive and Negative Social Support: Twelve items in the NSAL dataset were used to assess both positive and negative sources of social support (see Table 2). Only positive and negative support from family and church members was assessed in the NSAL. Three items measured positive social support from family members ("frequency family makes you feel loved excluding your spouse", "frequency family listens to your problems", and "frequency family expresses concern for well-being"). Three items assessed negative social support from family ("frequency family makes too many demands of you", "frequency family criticizes you", "frequency family takes advantage of you"). All positive and negative social support from family items were adapted from previously developed scales measuring positive and/or negative social support among friends and family (Fetzer Institute, 1999; Schuster, Kessler, & Aseltine, 1990). Cronbach's alpha for items related to positive social support among family was .75 and for negative social support .74 (Schuster, Kessler, & Aseltine, 1990). Findings from this study also observed that both positive and negative social support from family are associated with the depressed mood among adults (Schuster, Kessler, & Aseltine, 1990).

Three items assessed positive social support from church members ("church people make you feel loved", "church people listen to problems", and "church people express interest in well-being"). Three items also assessed negative social support from church members ("church people make too many demands on you", "church people criticize you", and "church people take advantage of you"). Items assessing positive and negative social support from church member were derived from a multidimensional scale measuring religious social support (Krause, 1999). Item-total correlations and internal consistencies using Cronbach's alpha was also previously assessed. Cronbach's alpha was .86 for positive support from church members and .64 for negative support from church members (Idler et al., 2003). Discriminate validity of the scale was

supported by the investigators observing an expected correlational pattern between the scale's domains (Idler et al., 2003). For example, the correlations between positive support from church members were positively associated with public religious activities (i.e. service attendance) (β=.34, p<.01) and private religious practices (i.e. meditation, private prayer, and Bible reading) (β=.31, p<.01) (Idler et al., 2003). Alternatively, negative support from church members was negatively associated with public (β=-.12, p<.01) and private religious practices (β=-.12, p<.01) (Idler et al., 2003).

Responses and scoring for all twelve items were as follows: 1-never/not too often, 2-fairly often, and 3-very often. Therefore, the higher the numerical value, the greater the amount of perceived positive and negative social support. Additionally, missing items as well as items coded as -9 and -8, were coded as missing. Items and response options can also be found in Table 2.

Covariates

Demographic Variables: Each of the nine demographic variables within this study were categorical. These variables were categorized as follows: gender (male and female), age (18-29 years, 30-44 years, 45-59 years, and ≥60 years), race (African American, Caribbean Black, and non-Hispanic white), income ($0-$19,999, $20,000-$39,999, $40,000-$59,999, ≥ $60,000), years of education (0-11 years, 12 years, 13-15 years, ≥ 16 years), marital status (married/cohabitation, divorced/widowed/separated, never married), employment status (employed and unemployed), length of stay in the U.S (U.S. born, ≤ 5 years, 6–10 years, 11–20 years, ≥ 21 years), and insurance coverage (insured and not insured).

Intrapersonal-level and Interpersonal-level Constructs: Within the NSAL dataset, many of the items related to intrapersonal-level constructs were derived or adapted from previously

developed and psychometrically sound scales (Holmes & Rahe, 1967; Pearlin & Schooler, 1978; Rosenberg, 1965). Yet the interpersonal-level constructs related to discrimination, were directly obtained from a previous cross-sectional study designed to assess the associations between discrimination and mental and physical health within a racially diverse study sample (Williams, Yu, Jackson, & Anderson, 1997). Additional information regarding the specific items used to operationalize the intrapersonal-level and interpersonal-level constructs can be found in the data analysis for study aim 1 subsection.

Data Analysis

The analytical procedures used to address each of the three study aims are described below. The NSAL sample weights, were applied to all data analyses.

Analyses of Demographic Data

Descriptive statistics of the categorical demographic variables were assessed through frequencies, chi-square, and Fisher's exact tests. The continuous intrapersonal-level and interpersonal-level constructs were assessed by calculating the overall mean values ($\bar{x}$) and standard deviations (SD) for each of the three racial groups. One-way ANOVA with Tukey tests were also conducted to examine the QOL domains, factors of social support (i.e., informal sources of social support as well as positive and negative social support), intrapersonal-level constructs, and interpersonal-level constructs by race. Significant associations were determined by p-values less than .05.

Bivariate Analyses

The crude association between the eight independent variables (support from family, support from friends, support from church members, support from fictive kin, positive support from family, positive support from church members, negative support from family, and negative

support from church members) and five dependent variables (physical well-being, psychological well-being, social well-being, spiritual well-being, and overall QOL) was assessed by conducting bivariate linear regressions. These analyses were conducted using the PROC SURVEYREG command in SAS 9.4 (SAS Institute, 2013).

Principal Component Factor Analyses

Principal component factor analysis (PCFA) was used to examine the internal consistency of items selected to measure variables related to positive/negative social support, QOL domains, and the intrapersonal-level constructs within this study. PCFA are commonly used analyses to determine the factor structure and to reduce the number of items related to a specific construct (Jolliffe, 1986). Items related to the following variables were examined with PCFA: positive/negative social support, psychological well-being, social well-being, spiritual well-being, and intrapersonal-level constructs (stress, coping, and self-esteem). PCFA were not conducted for physical well-being due to this domain only containing one item. These analyses were also not conducted for items related to sources of social support as well as the interpersonal-level constructs (major experiences of discrimination, everyday discrimination, frequency of contact with informal sources, social network ties, and social network size). The factor structure and internal consistency for major discrimination and everyday discrimination have been confirmed in previous studies (Hunte & Barry, 2012; Williams, Yu, Jackson, & Anderson, 1997). In the present study, Cronbach's alpha for major discrimination and everyday discrimination were 0.64 and 0.87, respectively. In terms of the remaining interpersonal-level constructs (i.e., frequency of contact with informal sources, social network ties, and social network size), the items for these variables were not designed to reflect a single factor. As a result, PCFA was not conducted for these variables.

All PCFA analyses were conducted using the PROC FACTOR command in SAS 9.4 (SAS Institute, 2013). Through these analyses, factors were determined by identifying eigenvalues >1 and determining the point of inflection within a scree plot (Kaiser, 1960). Items that loaded onto more than one factor or loaded less than 0.4 were removed (Tabachnick & Fidell, 2001). Once these items were removed, the factor analysis was repeated until no items were double loaded and/or a correlation value greater than 0.4 was achieved. After discovering which items loaded onto a specific factor using the PCFA, responses for those items were summed to provide an overall score for that factor. After conducting the PCFA for each of the previously mentioned variables, the internal consistency for each of the variables was assessed using Cronbach's alpha. A Cronbach's alpha greater than 0.7, is considered to be a good indicator of internal reliability (Nunnally & Bernstein, 1978; Perrin et al., 2008). For the purpose of this study, a value of 0.7 or greater was considered an acceptable indictor of internal consistency for the variables assessed within the PCFA.

Scoring Items Related to the Dependent, Independent, Intrapersonal-Level and Interpersonal-Level Constructs

Physical Well-being: Scores related to physical well-being ranged from 1 to 5. Higher scores indicated better physical well-being. Additional information related to the way in which this item was scored is available in Table 1.

Psychological Well-being: Of the 10 items selected to measure psychological well-being, the following three items did not load onto one factor: "general happiness these days", "satisfaction with life as a whole", and "worry about enough income to pay bills". The removal of the remaining three items resulted in a Cronbach's alpha of 0.8. All seven items within this factor were summed to produce an overall score for psychological well-being. Higher values indicated greater psychological well-being. Scores for each item are described in detailed within Table 1.

Social Well-being: A total of nine items were selected to measure social well-being. Cronbach's alpha for these items was acceptable prior to conducting a PCFA (α=.7). Seven of the items had over 40% of responses missing. To prevent these responses from biasing the results, a PCFA was conducted with the two items that had less than 40% missing ("Health problems caused difficulty with getting along/maintaining social life" and "Extremely afraid or shy in social situations"). However, these items did not load onto one factor. Given the item, "Extremely afraid or shy in social situations," displayed the lowest percentage of missing responses and has served as a measurement for social well-being in a previous study (Xu, Li, Pham, Salmon, & Theng, 2016), this item was chosen as the sole measure for social well-being in this study. The scores used to code the responses for this item are available in Table 1. Higher score values indicated better social well-being.

Spiritual Well-being: Two items were selected to measure spiritual well-being. The items also loaded onto one factor during the PCFA. The Cronbach's alpha value for these items was found to be acceptable (α=0.7). These items were then summed so that an overall composite score for spiritual well-being can be obtained (see Table 1). A higher score within this domain indicated greater spiritual well-being.

Overall QOL: All QOL domain scores were summed to produce an overall QOL composite score. The range for the overall QOL was between 12 to 29. Higher scores indicated better overall QOL.

Table 1: Items Used to Measure Quality of Life (QOL) Domains

QOL Domain Items	Responses	Scores
	Physical well-being	
1. How would you rate your overall physical health at the present time?	(refused, don't know, excellent, very good, good, fair, poor)	Refused and don't know were coded as missing. Items with the following responses were scored with a 1 (poor), 2 (fair), 3 (good), 4 (very good), 5 (excellent). Higher scores indicate better physical well-being.
	Psychological well-being	
1. Fear or panic attack leaving frightened/anxious/uneasy 2. Sad/empty/depressed for several day period 3. Discouraged about life for several day period 4. Lost interest in enjoyable things for several day period 5. Energetic/restless/talkative/unusual behavior period 6. Irritable/grumpy/bad mood for several day period 7. Worried more than others about same problems	(refused, don't know, yes, no)	Refused and don't know were coded as missing. Items with the following responses were scored with a 1 (yes), 2 (no). All items were summed to create one variable for psychological well-being (range: 7-14). Higher scores indicate better psychological well-being.

Table 1 (Continued)

QOL Domain Items	Responses	Scores
	Social well-being	
1. Extremely afraid or shy in social situations.	(refused, don't know, yes, no)	Refused and don't know were coded as missing. Items with the following responses were scored with a 1 (yes), 2 (no). Higher scores indicate better social well-being.
	Spiritual well-being	
1. Importance of spirituality in your life 2. How spiritual are you?	Item 1 responses (refused, don't know, very important, fairly important, not too important, and not important at all) Item 2 responses: (refused, don't know, very spiritual, fairly spiritual, not too spiritual, and not spiritual at all)	Refused and don't know were coded as missing. The first item with the following responses was scored with a 1 (not important at all), 2 (not too important), 3 (fairly important), and 4 (very important). The second item was coded in the following manner 1 (not spiritual at all), 2 (not too spiritual), 3 (fairly spiritual), and 4 (very spiritual). All items were summed to create one variable for spiritual well-being (range: 2-8). Higher scores indicate better spiritual well-being.

Informal Sources of Social Support: Items for each source ranged from 1 to 3. Higher numbers indicated more frequent perceived social support from a source. Table 2 provides additional information related to both the responses and scores for these items.

Positive and Negative Social Support: Items related to either positive or negative social support from family or church members loaded into four individual factors. The Cronbach's alpha for each of these factors is as follows: 0.8 for positive social support from family, 0.7 for positive social support from church members, 0.7 for negative social support from family, and 0.6 for negative social support from church members. All items within each of these four factors were summed to produce an overall score for each factor. The range for these four factors was 3 to 9. Higher scores indicated either more positive or negative social support. Scores used to measure each item related to positive and negative social support are available in Table 2.

Table 2: Items Used to Measure Social Support

Social Support Items	Responses	Scores
	Informal Sources of Support	
How often do people in your church (place of worship) help you out?	1-Very often, 2-Fairly Often, 3-Not too often, 4-Never, 6-Never needed help, -9-Refused, -8 Don't know	1-Never needed help/never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
How often do people in your family (children, grandparents, uncles, etc.) help you out?	1-Very often, 2-Fairly Often, 3-Not too often, 4-Never, 6-Never needed help, 7- I have no family, -9-Refused, -8-Don't know	1-Never needed help/never/not too often/I have no family, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
How often do your friends help you out?	1-Very often, 2-Fairly Often, 3-Not too often 4-Never, 6-Never needed help, -9-Refused, -8-Don't know	1-Never needed help/never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
How often do people close to your family who are not really blood or marriage related help you out?	1-Very often, 2-Fairly Often, 3-Not too often 4-Never, 6-Never needed help, -9-Refused -8-Don't know	1-Never needed help/never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing

Table 2 (Continued)

Social Support Items	Responses	Scores
	Positive Social Support from Family	
Other than your (spouse/partner) how often do your family members make you feel loved and cared for?	1-Very often, 2-Fairly often, 3-Not too often 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
Other than your (spouse/partner) how often do your family members listen to you talk about your private problems and concerns?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
Other than your (spouse/partner) how often do your family members express interest in your well-being?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
	Negative Social Support from Family	
Other than your (spouse/partner) how often do your family members make too many demands on you?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing

Table 2 (Continued)

Social Support Items	Responses	Scores
	Negative Social Support from Family (Continued)	
Other than your (spouse/partner) how often do your family members criticize you and the things you do?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
Other than your (spouse/partner) how often do your family members try to take advantage of you?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
	Positive Social Support from Church Members	
How often do the people in your church make you feel loved and cared for?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
How often do the people in your church listen to your talk about your private problems and concerns?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
How often do the people in your church express interest in your well-being?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing

Table 2 (Continued)

Social Support Items	Responses	Scores
	Negative Social Support from Church Members	
How often do the people in your church make too many demands on you?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
How often do the people in your church criticize you and the things you do?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing
How often do the people in your church try to take advantage of you?	1-Very often, 2-Fairly often, 3-Not too often, 4-Never, -9-Refused, -8-Don't know	1- Never/not too often, 2-Fairly often, 3-Very often, -9 and -8 were coded as missing

Intrapersonal-level constructs: Three of the 10 items for the variable stress/personal stressors loaded onto one factor during PCFA ("Over the past month, have you had problems with your children", "Over the past month, have you had family/marriage problems", and "Over the past month, have you had love life problems"). However, the Cronbach's alpha for this factor increased when all 10 items were included (α=.5 v. α=.6). As a result, all 10 items were incorporated as a means for measuring stress. A previous study that used the NSAL dataset, also used these items to measure stress (Johnson, 2010). Three items related to coping did not load onto one factor: "What happens to me in future depends on me", "Look to God for strength", and "Can do just about anything set my mind to". After removing these items, the Cronbach's alpha for the remaining five items was 0.8. Lastly, two of the twelve items related to self-esteem did not load onto one factor: "I want more self-respect" and "My future seems hopeless/not changing for the better." The remaining ten items produced a Cronbach's alpha of 0.8. All responses and scores used for each of the intrapersonal-level constructs are available in Table 3.

Interpersonal-level constructs: The items related to a majority of the interpersonal-level constructs displayed acceptable internal consistency with Cronbach's alpha values ranging from 0.5-0.8. However, two interpersonal-level constructs (frequency of contact with informal sources and social network ties) displayed Cronbach's alpha values lower than 0.5. Nonetheless, responses related to all interpersonal-level constructs were scored. All responses and scores for these items are available in Table 3.

Table 3: Items Used to Measure Intrapersonal-Level and Interpersonal-Level Constructs

Intrapersonal-Level Items	Responses	Scores
	Stress	
1. Over the past month, have you had health problems? 2. Over the past month, have you had money problems? 3. Over the past month, have you had job problems? 4. Over the past month, have you had problems with your children? 5. Over the past month, have you had family/marriage problems? 6. Over the past month, have you/family member been a victim of a crime? 7. Over the past month, have you experienced police problems? 8. Over the past month, have you had love life problems? 9. Over the past month, have you/family member experienced race problems? 10. Over the past month, have you experienced gambling problems?	(yes, no, refused, don't know)	Items were coded as either 1 for yes and 0 for no. Each of these items were summed, and produced a range from 0-9. Refused and don't know were coded as missing. Higher scores indicate more stress.

Table 3 (Continued)

Intrapersonal-Level Items	Responses	Scores
	Coping	
1. No way to solve some of my problems. 2. I feel pushed around in life. 3. Have little control over what happens to me. 4. I feel helpless dealing with life problems. 5. Little I can do to change things important things in life.	(refused, don't know, strongly agree, somewhat agree, somewhat disagree, strongly disagree)	Items with the following responses were scored with a 1 (strongly disagree), 2 (somewhat disagree), 3 (somewhat agree), 4 (strongly agree). Refused and don't know were coded as missing. These items were summed and produced a range from 5-20. Higher scores indicate better coping.
	Self-esteem	
1. I am person of worth/equal to others. 2. I have a number of good qualities. 3. I am a failure. 4. I do things as well as others. 5. I don't have much to be proud of. 6. I take positive attitude toward self.	(refused, don't know, strongly agree, somewhat agree, somewhat disagree, strongly disagree)	The items 1, 2, 4, 6, and 7, responses were score with a 1 (strongly disagree), 2 (somewhat disagree), 3 (somewhat agree), 4 (strongly agree). Items 3, 5, 8, 9, and 10 were given scores of 1 (strongly agree), 2 (somewhat agree), 3 (somewhat disagree) and 4 (strongly disagree). Refused and don't know were

Table 3 (Continued)

Intrapersonal-Level Items	Responses	Scores
	Self-esteem (Continued)	
7. I am satisfied with self. 8. I sometimes feel useless. 9. I sometimes think I am no good. 10. It is impossible to reach my goals.	(refused, don't know, strongly agree, somewhat agree, somewhat disagree, strongly disagree)	The items 1, 2, 4, 6, and 7, responses were score with a 1 (strongly disagree), 2 (somewhat disagree), 3 (somewhat agree), 4 (strongly agree). Items 3, 5, 8, 9, and 10 were given scores of 1 (strongly agree), 2 (somewhat agree), 3 (somewhat disagree) and 4 (strongly disagree). Refused and don't know were
	Major experiences of discrimination	
1. Unfairly fired 2. Ever not hired for unfair reasons 3. Unfairly denied promotion 4. Unfairly abused by police 5. Unfairly discouraged from continuing education 6. Unfairly prevented from moving into neighborhood	(refused, don't know, yes, no, not applicable)	Not applicable responses were coded as missing, which is similar to the coding method used within a previous study (George & Bassani, 2018). Items related to major experiences of discrimination were given a score of 1-yes and 0-no. All items were summed to produce and range from 0-8. Refused and don't know were coded as missing. A higher score indicated more experiences with major discrimination. The calculated Cronbach's alpha for these items was 0.64.

Table 3 (Continued)

Interpersonal-Level Items	Responses	Scores
Major experiences of discrimination (Continued)		
7. Neighbors made life more difficult 8. Unfairly denied loan 9. Received unusually bad service from repairman	(refused, don't know, yes, no, not applicable)	Not applicable responses were coded as missing, which is similar to the coding method used within a previous study (George & Bassani, 2018). Items related to major experiences of discrimination were given a score of 1-yes and 0-no. All items were summed to produce and range from 0-8. Refused and don't know were coded as missing. A higher score indicated more experiences with major discrimination. The calculated Cronbach's alpha for these items was 0.64.

Table 3 (Continued)

Interpersonal-Level Items	Responses	Scores
Everyday experiences of discrimination		
1. Frequency treated w/ less courtesy than others 2. Frequency treated with less respect than others 3. Frequency received poorer restaurant service than others 4. Frequency people act like you are not smart 5. Frequency people act afraid of you 6. Frequency people act like you are dishonest 7. Frequency people act better than you 8. Frequency called names/insulted 9. Frequency threatened/harassed 10. Frequency followed in stores	(refused, don't know, almost every day, at least one a week, a few times a month, a few times a year, less than once a year, never)	Items related to everyday discrimination were given a score of: 0-never/less than once a year, 1-a few times a year, 2-a few times a month, 3-at least once a week, 4-almost every day. All items were summed and produced a range from 0-40. A higher score indicated more experiences with everyday discrimination. Refused and don't know were coded as missing. The calculated Cronbach's alpha for these items was 0.87.

Table 3 (Continued)

Interpersonal-Level Items	Responses	Scores
	Frequency of contact with informal sources	
1. Frequency see/write/phone church members 2. Frequency see/write/phone relatives who don't live w/ you 3. Frequency see/write/phone with friends 4. Frequency of visits with neighbors	(refused, don't know, responses vary)	Item 1 was coded in the following manner: 0-never, 1-few times a year, 2-at least once a month, 3-few times a month, 4-at least once a week, 5-nearly everyday. Item 2 was coded as 0-never/hardly never 1-few times a year, 2-at least once a month, 3-few times a month, 4-at least once a week, 5-nearly everyday. Item 3 was coded as 0-never/hardly never/has no friends 1-few times a year, 2-at least once a month, 3-few times a month, 4-at least once a week, 5-nearly everyday. Item 4 was coded as 0-never, 1-few times a year, 2-at least once a month, 3-few times a month, 4-at least once a week, 5-nearly everyday. Refused and don't know were coded as missing. All items were summed and produced a range of 0-20. Higher scores indicated more frequent contact with an informal source. The calculated Cronbach's alpha for these items was 0.44.

Table 3 (Continued)

Interpersonal-Level constructs	Responses	Scores
	Social Network Ties	
1. Closeness you feel towards friends. 2. Closeness to church people. 3. How close do you feel to family members?	(Very close, fairly close, not too close, not close at all)	The three items responses were coded as 1 for not close at all, 2 for not too close, 3 for fairly close, and 4 very close. All items were summed and produced a range of 4-12. Higher scores indicated an increase in closeness with an informal source. The calculated Cronbach's alpha for these items was 0.41.
	Social Network Size	
1. Number of relatives would help you if needed 2. Number of church people would help you if needed 3. Number of people close to your family that are treated as relative	Free response	Items within this category first converted as a categorical variable and contain the following codes: 1 for 0-5, 2 for 6-9, 3 for 10-15, 4 four ≥16. All items were summed and produced a range of 3-12. Higher scores indicated a larger social network size. The calculated Cronbach's alpha for these items was 0.58.

Data Analysis for Study Aim 1

Confounding: The following demographic variables have been previously controlled for as confounders when assessing the relationship between social support and the QOL of individuals with chronic illness included: age (Kroenke et al., 2013; Sammarco, 2001), gender (Kroenke et al., 2013; Sammarco, 2001), race (Kroenke et al., 2013), years of education (Sammarco, 2001), employment status (Sammarco, 2001), marital status (Untas et al., 2010), income (Kroenke et al., 2013), length of stay in the U.S. (Lim et al., 2008), and insurance coverage (Tang, Brown, Funnell, & Anderson, 2008). Each of these demographic variables was tested in the study dataset to determine whether they confounded the associations under study. Confounding was assessed using the 10% rule ($(\frac{crude\ coefficient - adjusted\ coefficient}{adjusted\ coefficient})$ x 100) (Grayson, 1987; Maldonado & Greenland, 1993). Only variables that changed the beta coefficient of independent/dependent variable associations by 10% or more, and were not considered to lie within the causal pathway, were considered to be confounders (Maldonado & Greenland, 1993). A depiction of the relationship between potential confounders and the independent and dependent variables is available in Figure 1. Given the eight independent variables and five dependent variables (physical well-being, psychological well-being, social well-being, spiritual well-being, and overall QOL) within this study, a total of 40 associations were conducted to assess confounding.

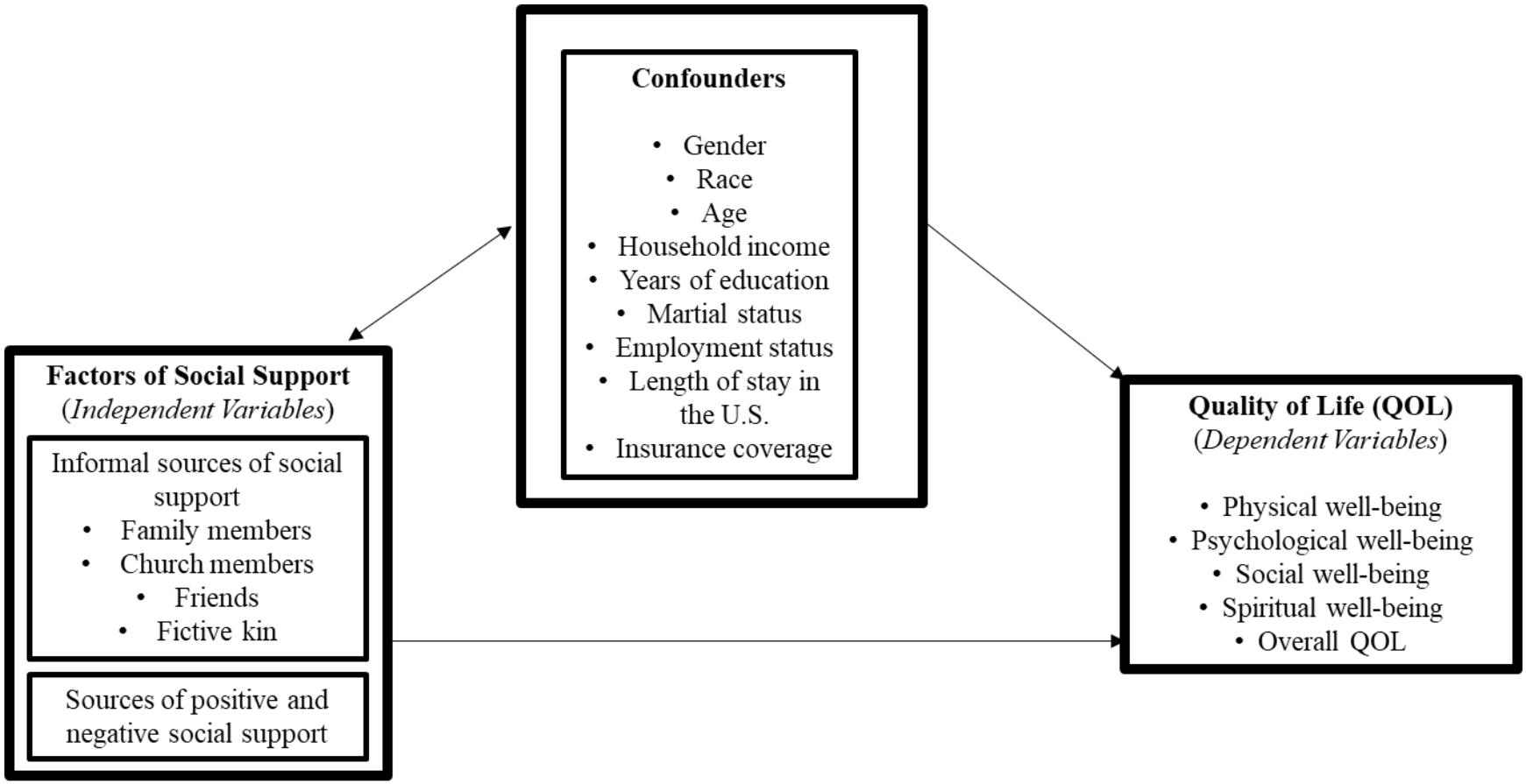

Figure 1: Figure depicting the demographic variables confounding the relationship between the factors of social support and QOL.

Moderation: Moderation analyses were conducted using SAS 9.4 (SAS Institute, 2013). Given the primary study aim, all intrapersonal-level constructs and interpersonal-level constructs were tested as potential moderators. Within this study, moderators were variables that can either weaken or strengthen the association between independent variables and dependent variables (Baron & Kenny, 1986). The reason for exploring the potential moderating effects of these variables was to better understand the specifics of the association between factors of social support (i.e., informal sources of social support and positive and negative social support) and the QOL domains among individuals with chronic illnesses. The methods used to test the moderating effect were derived from the suggestions of a previous study (Aiken, West, & Reno, 1991). Prior to testing the moderating effects, interaction terms were created by multiplying each factor of social support to each intrapersonal-level and interpersonal-level variable. After obtaining these interaction terms, the moderation effect was then examined by constructing linear regression models.

Each linear regression model was fully adjusted by including all covariate variables, a specific factor of social support, and the interaction term of interest. For example, when testing for the moderation effect of stress between positive social support from family and social well-being, the final regression model is as follows: $\text{Social well-being}_i = \beta_0 + \beta_1 \times \text{race}_i + \beta_2 \times \text{gender}_i + \beta_3 \times \text{age}_i + \beta_4 \times \text{income}_i + \beta_5 \times \text{education}_i + \beta_6 \times \text{martial status}_i + \beta_7 \times \text{employment}_i + \beta_8 \times \text{length of stay in U.S.}_i + \beta_9 \times \text{insured}_i \text{ x } \beta_{10} \times \text{stress}_i + \beta_{11} \times \text{coping}_i + \beta_{12} \times \text{self-esteem}_i + \beta_{13} \times \text{major discrimination}_i + \beta_{14} \times \text{everyday discrimination}_i + \beta_{15} \times \text{frequency of contact}_i + \beta_{16} \times \text{social network ties}_i + \beta_{17} \times \text{social network size}_i + \beta_{18} \times \text{positive social support from family}_i + \beta_{19} \times \text{positive social support from family x stress}_i + \varepsilon_i$. A path diagram depicting the moderation effect, is available in Figure 2.

A total of forty associations were also evaluated to assess the potential moderating effect of intrapersonal-level and interpersonal-level constructs on the associations between factors of social support and the QOL domains among individuals with chronic illnesses. This allowed for a more comprehensive assessment of intrapersonal-level and interpersonal-level constructs that moderated the associations between factors of social support (i.e., sources of social support or positive and negative social support) and the QOL domains among individuals with chronic illnesses. All moderation effects were considered to be significant if the p-value interaction terms were less than .05 within the final model (Henseler & Fassott, 2010). Given the fact that the moderators within this study are continuous, the Johnson-Neyman technique was employed as a means of pinpointing the regions of significance (Johnson & Neyman, 1936). In other words, this technique identifies regions within the continuum of the independent variables were the moderating effect is significant and regions where it is not significant (Johnson & Neyman, 1936).

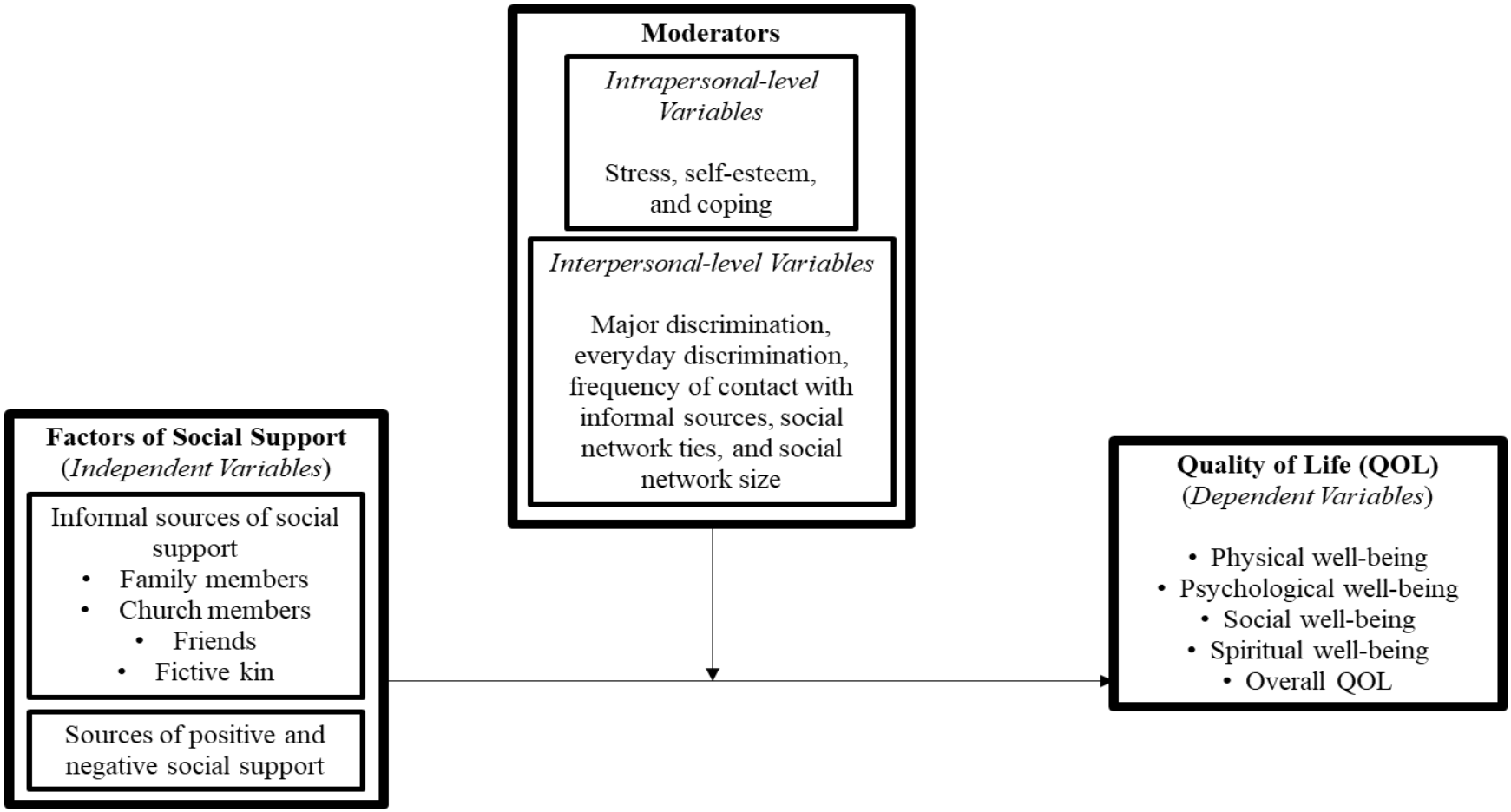

Figure 2: Path diagram depicting the relationship between the factors of social support and QOL being moderated by intrapersonal-level and interpersonal-level variables

Mediation: Following the moderation analyses, simple mediation analyses were conducted. Similar to the moderation analyses, the mediation analyses were designed to assess the specifics of the associations between factors of social support (i.e., sources of social support or positive and negative social support) and the QOL domains among individuals with chronic illnesses. Mediators are variables that link the causal relationship between an independent and dependent variable (Hayes, 2009). Bootstrapping techniques suggested by Preacher and Hayes (Preacher & Hayes, 2008) guided the mediation analyses within this study. All mediation analyses were performed within SPSS version 24 (SPSS Inc., 2007), by using model 4 in PROCESS macro (Hayes, 2013). All covariates were controlled for within this model. Benefits of using the bootstrapping technique when testing for mediation is that it allows for more control of type I errors (Shrout & Bolger, 2002), and it does not require the data to be normally distributed (Hayes, 2017).

A path diagram of the mediation model is depicted in Figure 3. Path *a* represents the path from the independent variables (factors of social support) to the mediators (intrapersonal-level and interpersonal-level constructs). The *b* path is based on the influence of the mediators on the dependent variables (QOL domains and overall QOL). *C'* is the direct effect of the independent variables on the dependent variables when the mediator is accounted for. Through the bootstrapping approach, mediating or indirect effects (a x b) were obtained by generating 5,000 bootstrapping samples. This allowed for the generation of bias-corrected 95% confidence intervals (BCa 95% CI) (Preacher & Hayes, 2008). Mediating effects were determined to be significant if the confidence interval did not include zero. Similar to the analytical approaches used to assess both confounding and moderation, 40 associations were examined to determine which intrapersonal-level and interpersonal-level constructs consistently mediated the

associations between factors of social support and the QOL domains among individuals with chronic illnesses.

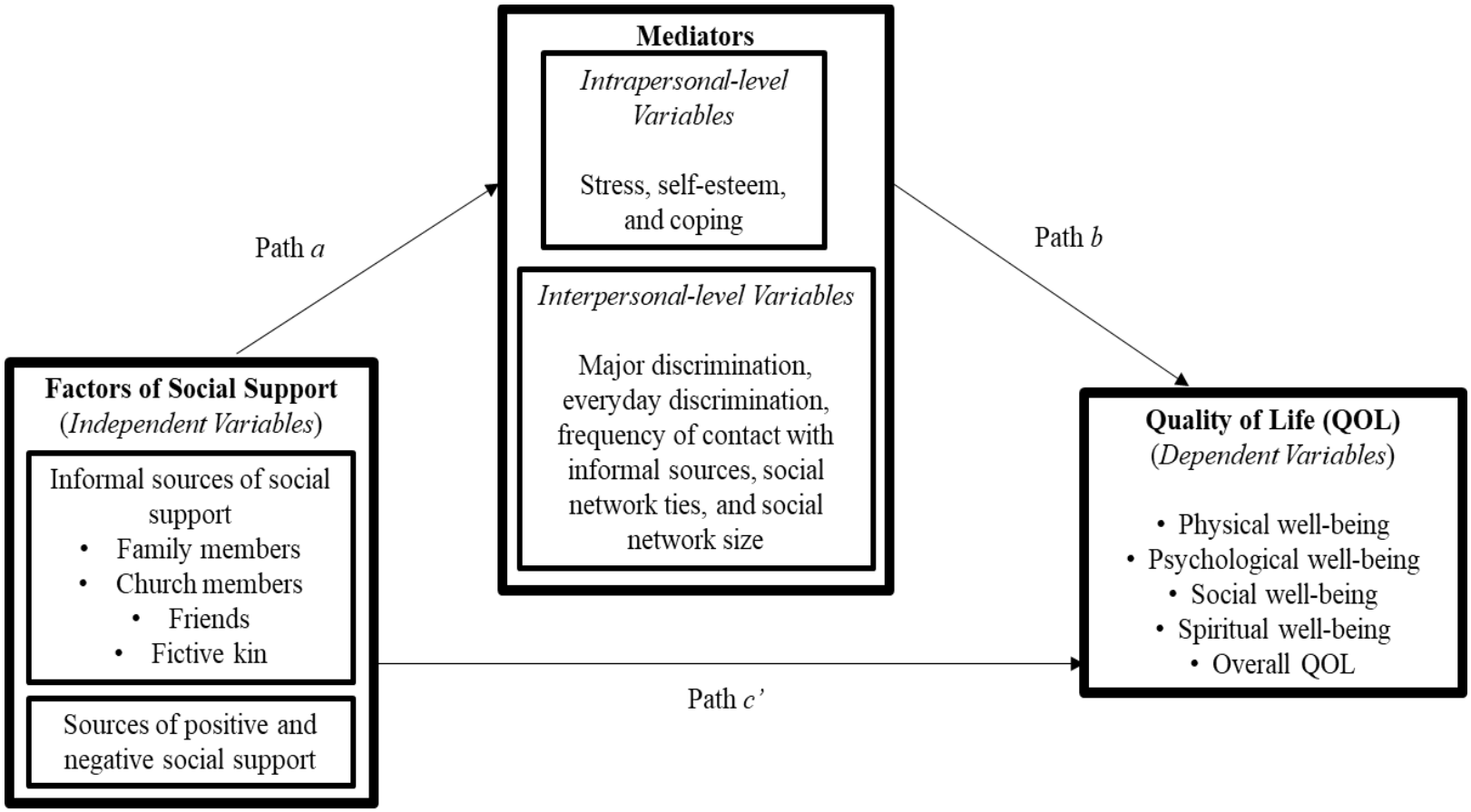

Figure 3: Path diagram of intrapersonal and interpersonal variables mediating the relationship between social support and QOL

Data Analysis Plan for Study Aims 2 and 3

Complete case analyses (using hierarchical linear regression models) as well as multiple imputation analyses were constructed to assess the racial differences between the independent variables (sources of social support, positive social support, and negative social support) and the dependent variables (physical well-being, psychological well-being, social well-being, spiritual well-being, and overall QOL). One of the rationales for conducting complete case analyses was due to previous studies using this analytical approach to assess the associations between various independent and dependent variables derived from the NSAL (Damian & Mendelson, 2017; Ida & Christie-Mizell, 2012). Complete case analyses are simple analytical approaches for analyzing data (Little & Rubin, 1987). Moreover, complete case analyses are also beneficial when comparing the descriptive statistics of the study sample (Little & Rubin, 1987). All regression analyses were performed using the PROC SURVEYREG command in SAS 9.4 (SAS Institute, 2013).

Given that the missingness within this study ranged from 0.1% to 25.1%, multiple imputation analyses were considered to be the most reasonable approach for analyzing the data for study aims 2 an 3 (Graham, 2009). As a result, multiple imputation analyses were the primary analyses for these study aims. The level of significance for all regression and multiple imputation analyses was set at a p-value less than 0.05. Sampling weights were included in each of these analyses to account for probability variation within the selected households (Heeringa et al., 2004).

Prior to conducting the complete case and multiple imputation analyses, the assumption of multicollinearity was tested by examining Pearson correlation coefficients. Any variables that displayed an intercorrelation greater than 0.8, would be removed from the analysis as they would

indicate collinearity (Midi, Sarkar, & Rana, 2010). Because no variables displayed an intercorrelation greater than 0.8, all variables were included within the regression analyses.

Multivariate Analyses for Study Aim 2: For study aim 2, associations between sources of informal social support and QOL domains were examined. Individuals of African descent have reported receiving more support from church members compared to whites (Krause, 2002). Moreover, individuals of African descent have reported greater spiritual well-being compared to whites (Peterman et al., 2002). As a result, I hypothesized that racial differences would be seen across sources of social support and their associations with the QOL among individuals with chronic illnesses. Specifically, I hypothesized the pattern of the associations between informal sources of social support and the four QOL domains will differ between individuals of African descent (i.e., African Americans and Caribbean Blacks) and non-Hispanic whites. In other words, the direction of the beta coefficients will be similar for both African Americans and Caribbean Blacks. Alternatively, non-Hispanic whites will have beta estimates in the opposite direction when compared to individuals of African descent.

Complete case analyses were constructed for models one, two, and three to analyze study aim 2. The first model assessed the association between informal sources of social support and both the QOL domains as well as the overall QOL. The second model included the informal sources of social support and the covariate variables (i.e. sociodemographic, intrapersonal-level, and interpersonal-level). Model three contains the covariates, the informal sources of social support, as well as the interaction terms (support from family x race, support from friends x race, support from church members x race, and support from fictive kin x race). Lastly, a fourth model was conducted to assess the associations between informal sources of social support and the QOL domains among individuals with chronic illnesses using multiple imputation analyses. The

fourth model contained the same variables as model 3 (the covariates, informal sources of social support, and the interaction terms) after completing the multiple imputation analysis (methodology for conducting this analysis is described in the multiple imputation analysis section). Conducting both complete case and multiple imputation analyses allowed for a comparison of the beta coefficients once the missing data was included within the model.

The moderating effect of race was solely assessed within model 3 and 4 due to the overall goal of the study to assess racial differences between social support and QOL among individuals with chronic illnesses. No other moderators were controlled for within these analyses. Interactions were determined to be significant based on the p-values being less than .05. The patterns of the association between informal sources of social support and QOL were assessed by stratifying the study sample by race.

Multivariate Analyses for Study Aim 3: The associations between informal sources of positive and negative social support and the QOL domains among individuals who have a history of chronic illnesses were also examined. It has been suggested the individuals of African descent with chronic illnesses often experience both positive and negative support from their family (Hamilton et al., 2010). However among church members, previous studies have observed racial differences in both positive (Krause, 2002) and negative social support (Lincoln et al., 2013). Findings from a cross-sectional study conducted by Krause showed positive support from church members was significantly more prevalent among African Americans compared to whites (Krause, 2002). Based on this finding, I hypothesized that racial differences will be seen across sources of both positive and negative sources social support and their associations with the QOL among individuals with chronic illnesses. In addition to this, I hypothesized the pattern of the associations between positive and negative sources of social support and the four QOL domains

will differ between individuals of African descent (i.e., African Americans and Caribbean Blacks) and non-Hispanic whites.

Similar to study aim 2, three complete case analyses and one multiple imputation analysis were conducted for each association. The difference being that along with the previously mentioned covariates, the fully adjusted models (models 2-4) contain variables related to informal sources (family and church members) of positive and negative social support. Variables from model 2 were also included within the third model along with the following interaction term: race x positive support from family, race x positive support from church members, race x negative support from family, and race x negative support from church members. The fourth model is based on findings from the multiple imputation analyses and contains the same variables from model 3.

The R^2 and F statistic were obtained for all complete case and multiple imputation analyses. The R^2 (percent of variance within the model or goodness-of-fit) (Woodson et al., 2012) and F statistic (overall significance of the model) (Mohadjer, Yansaneh, & Brick, 1996), were obtained through the PROC GLM command in SAS. A depiction of the moderating effect of race within the relationship between factors of social support and QOL domains is available in Figure 4.

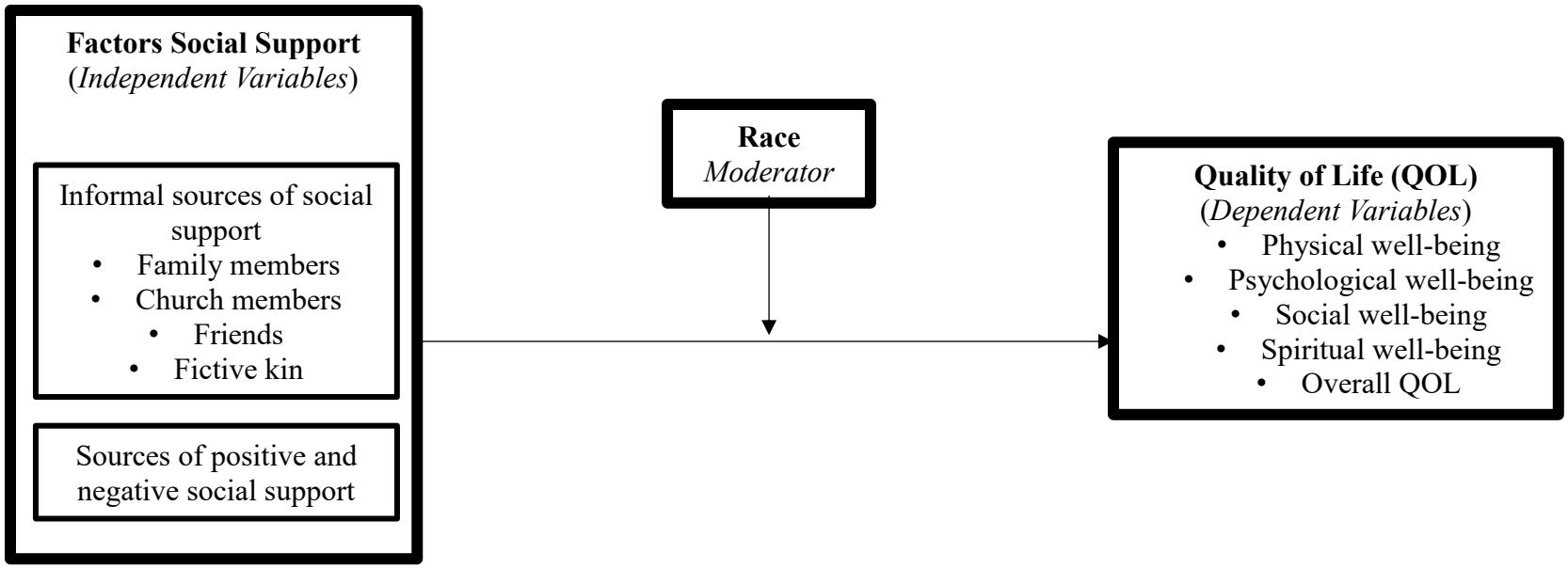

Figure 4: Path diagram representing race as potential moderator within the relationship between factors of social support and QOL

Multiple Imputation Analysis

Due to the range of missing data, dummy variable adjustments were conducted to assess the patterns of missingness. More specifically, dummy variable adjustments assessed if the data was ignorable (i.e., missing at random (MAR)). It is recognized there are no formal statistical tests for determining whether data are non-ignorable or not missing at random (NMAR) (Price, Roesch, Walsh, & Landsverk, 2015). As a result, this pattern of missingness was not assessed within this study. By conducting dummy variable adjustments, missing values for specific variables (i.e., intrapersonal-level, interpersonal-level, factors of social support, and the four QOL domains) were given a code of 1 and all items with a response were given a code of zero (Cohen & Cohen, 1975). A logistic regression analysis was conducted to determine if a significant relationship existed between the missing data for each of these variables and the demographic variables (i.e., gender, age, race, household income, years of education, marital status, employment status, length of stay in the U.S., and insurance coverage).

After conducting the dummy variable adjustments, missing data was assessed through multiple imputation analyses. The MAR pattern meets the assumption of multiple imputation (Schafer & Olsen, 1998). Multiple imputation analyses are designed to reduce the amount of missing data within the study (Sterne et al., 2009). In order to accomplish this task, a PROC MI command was employed within SAS using a fully conditional specification (FCS) approach. The FCS approach is beneficial as it relaxes the assumption of normality and allows for the inclusion of both continuous and categorical data during the multiple imputation analysis (Liu & De, 2015).

Once the imputations were carried out using this command, the results were combined using PROC MIANALYZE command in SAS. Models within this SAS command were adjusted for all demographic, intrapersonal-level, and interpersonal-level constructs. These models also

controlled for the potential moderating effect of race. Conducting the multiple imputation analysis in this manner, allowed for a better understanding of the influence of missing responses on the associations between factors of social support and the QOL domains among a racially diverse study sample of individuals with chronic illnesses.

CHAPTER 4: RESULTS

Demographic Characteristics of the Study Sample

A detailed description of the demographic variables for the study sample is available in Table 4. A total of 3,285 NSAL participants indicated they had at least one of the fifteen chronic illnesses identified in this study's inclusion criteria. Within the overall study sample, most participants identified as being female (66%), between the ages of 45 to 59 (30.4%), having a household income between $0 to $19,999 (42%), 12 years of education (33%), employed (58.5%), born in the U.S. (83.5%), and insured (84.2%). The prevalence of participants within the married (38.3%) and divorced/widowed/separated categories (38.2%) was approximately the same.

527 (16%) were non-Hispanic white, 755 (23%) were Caribbean Black, and 2,003 (61%) were African American. Women were over represented compared to men in all three racial groups (62.3% for non-Hispanic whites, 65.3% for Caribbean Blacks, and 67.5% for African Americans). A majority (36.8%) of non-Hispanic whites were 60 years of age or older. A majority (30.6%) of Caribbean Blacks were 30 to 44 years of age, and a majority (30.6%) of African Americans were 45 to 59 years of age. Within the three racial groups, a higher prevalence of non-Hispanic whites (n=240, 45.5%) and Caribbean Blacks (n=329, 43.6%) identified as being either married or cohabiting. African Americans reported a higher prevalence of being divorced/widowed/separated (n=809, 40.4%). Caribbean Blacks reported the lowest prevalence of being born in the United States (n=219, 29.2%). There were significant differences across racial groups for gender ($p=0.002$), household income ($p<.0001$), years of education ($p<.0001$), marital status (<.0001), employment status ($p=0.009$), and length of stay in the U.S. ($p<.0001$).

In terms of the overall mean scores for the dependent variables of social support, scores for support from family were the greatest of all the four informal sources of support within the overall study sample (1.82 ± 0.85). The overall mean score for support from family was also the greatest within each of the three racial groups as well (non-Hispanic white: 1.86 ± 0.85, Caribbean Black: 1.77 ± 0.84, and African American: 1.83 ± 0.85). Significant associations were observed between the three racial groups and support from friends (p=0.01) and support from fictive kin (p=0.02). Of the two sources of positive social support (family and church members), the mean scores were the greatest for positive support from family within the overall study sample (6.87 ± 1.88) as well as the three racial groups (non-Hispanic white: 6.93 ± 1.87, Caribbean Black: 6.79 ± 1.86, and African American: 6.89 ± 1.90). However, no significant associated was observed between race and positive family support (p=0.39). Race was significantly associated with positive support from church members, negative support from family, and negative support from church members (all p-values <.0001). Mean scores were also greater for negative support from family compared to negative support from church members within the overall study sample (3.88 ± 1.52) and the three racial groups (non-Hispanic white: 3.61 ± 1.26, Caribbean Black: 3.87 ± 1.48, and African American: 3.96 ± 1.59).

Caribbean Blacks displayed the greatest overall mean score for physical well-being (3.16 ± 1.07), psychological well-being (11.52 ± 2.22) and social well-being (1.68 ± 0.47). The mean score value for spiritual well-being was the greatest among African Americans (7.20 ± 1.01). However, non-Hispanic whites displayed the greatest mean score value for overall QOL (22.50 ± 3.32). Race was significantly associated with psychological well-being (p=0.001), social well-being (p=0.01), spiritual well-being (p<.0001), and overall QOL (p<.0001).

Among the three intrapersonal-level constructs, the overall mean score for stress was greater among African Americans (1.96 ± 1.61). Caribbean Blacks displayed the lowest overall mean scores for coping (14.98 ± 3.86) and the greatest overall mean scores for self-esteem (35.84 ± 4.13). Only stress was significantly association with race ($p<.0001$).

Race was also significantly associated with all five interpersonal-level constructs. Non-Hispanic whites had the lowest overall mean scores for major discrimination (1.15 ± 1.39) and everyday discrimination (3.20 ± 4.87). The mean scores for frequency of contact with informal sources (13.33 ± 3.96) and social network size (6.78 ± 2.58) were greater among non-Hispanic whites. Means scores for social network ties were the greatest among African Americans (10.06 ± 1.62).

Table 4: Demographic Characteristics, Social Support, and Quality of Life of Adults with Chronic Illnesses in The National Survey of American Life (n=3,285)

	Total (n=3,285)	Non-Hispanic White (n=527)	Caribbean Black (n=755)	African American (n=2,003)	p-value[a]
Sex[b]					0.002
Male	1,117 (34.0)	204 (38.7)	262 (34.7)	651 (32.5)	
Female	2,168 (66.0)	323 (62.3)	493 (65.3)	1,352 (67.5)	
Age[b]					0.126
18-29 years	438 (13.3)	46 (8.7)	118 (15.6)	274 (13.7)	
30-44 years	933 (28.4)	116 (22.0)	231 (30.6)	586 (29.3)	
45-59 years	1,000 (30.4)	171 (32.5)	217 (28.7)	612 (30.6)	
60 years or more	914 (27.8)	194 (36.8)	189 (25.0)	531 (26.5)	
Household Income[b]					<.0001
$0-$19,999	1,381 (42.0)	172 (32.6)	241 (31.9)	968 (48.3)	
$20,000-$39,999	915 (27.9)	151 (28.7)	240 (31.8)	524 (26.2)	
$40,000-$59,999	472 (14.4)	94 (17.8)	115 (15.2)	263 (13.1)	
≥$60,000	517 (15.7)	110 (20.9)	159 (21.1)	248 (12.4)	

Table 4 (Continued)

	Total (n=3,285)	**Non-Hispanic White (n=527)**	**Caribbean Black (n=755)**	**African American (n=2,003)**	**p-value[a]**
Years of education[b]					<.0001
0-11 years	919 (28.0)	106 (20.1)	172 (22.8)	641 (32.0)	
12 years	1,094 (33.3)	178 (33.8)	216 (28.6)	700 (35.0)	
13-15 years	718 (21.9)	121 (23.0)	182 (24.1)	415 (20.7)	
≥16 years	554 (16.9)	122 (23.2)	185 (24.5)	415 (20.7)	
Marital Status[b]					<.0001
Married/cohabiting	1,258 (38.3)	240 (45.5)	329 (43.6)	689 (34.0)	
Divorced/widowed/separated	1,256 (38.2)	217 (41.2)	230 (30.5)	809 (40.4)	
Never married	771 (23.5)	70 (13.3)	196 (26.0)	505 (25.2)	
Employment Status[b]					0.01
Employed	1,921 (58.5)	305 (57.9)	489 (64.8)	1,127 (56.3)	
Unemployed	1,364 (41.5)	222 (42.1)	266 (35.2)	876 (43.7)	

Table 4 (Continued)

	Total (n=3,285)	**Non-Hispanic White (n=527)**	**Caribbean Black (n=755)**	**African American (n=2,003)**	**p-value[a]**
Length of Stay in the U.S.[b]					<.0001
U.S. Born	2,704 (83.5)	517 (99.8)	219 (29.2)	1,968 (99.8)	
<5 years	33 (1.0)	0 (0)	31 (4.1)	2 (0.1)	
6-10 years	57 (1.8)	1 (0.2)	54 (7.2)	2(0.1)	
11-20 years	134 (4.1)	0 (0)	134 (17.9)	0 (0)	
≥21 years	312 (9.6)	0 (0)	312 (41.6)	0 (0)	
Insurance coverage[b]					0.27
Insured	2,765(84.2)	463 (87.9)	630 (83.4)	1,672 (83.5)	
Not Insured	520(15.8)	64 (12.1)	125 (16.6)	331 (16.5)	
Informal Sources of Support[c]					
Support from family	1.82 ± 0.85	1.86 ± 0.85	1.77 ± 0.84	1.83 ± 0.85	0.13
Support from friends	1.64 ± 0.77	1.73 ± 0.77	1.61 ± 0.77	1.63 ± 0.76	0.01
Support from church members	1.50 ± 0.74	1.50 ±0.72)	1.44 ± 0.70	1.52 ± 0.76	0.06
Support from fictive kin	1.75 ± 0.78	1.79 ± 0.79	1.67 ± 0.78	1.76 ± 0.78	0.02

Table 4 (Continued)

	Total (n=3,285)	**Non-Hispanic White (n=527)**	**Caribbean Black (n=755)**	**African American (n=2,003)**	**p-value[a]**
Positive Social Support[c]					
Positive support from family	6.87 ± 1.88	6.93 ± 1.87	6.79 ± 1.86	6.89 ± 1.90	0.39
Positive support from church members	6.27 ± 1.91	6.25 ± 1.90	5.93 ± 1.92	6.39 ± 1.89	<.0001
Negative Social Support[c]					
Negative support from family	3.88 ± 1.52	3.61 ± 1.26	3.87 ± 1.48	3.96 ± 1.59	<.0001
Negative support from church members	3.42 ± 1.00	3.19 ± 0.63	3.37 ± 0.86	3.48 ± 1.11	<.0001
Quality of Life (QOL) Domains[c]					
Physical well-being	3.09 ± 1.06	3.11 ± 1.05	3.16 ± 1.07	3.06 ± 1.06	0.11
Psychological well-being	11.33 ± 2.32	11.01 ± 2.30	11.52 ± 2.22	11.34 ± 2.36	0.001
Social well-being	1.64 ± 0.48	1.60 ± 0.49	1.68 ± 0.47	1.64 ± 0.48	0.01
Spiritual well-being	7.13 ± 1.10	6.86 ± 1.36	7.11 ± 1.11	7.20 ± 1.01	<.0001
Overall QOL	23.13 ± 3.21	22.50 ± 3.32	23.37 ± 3.09	23.21 ± 3.21	<.0001

Table 4 (Continued)

	Total (n=3,285)	**Non-Hispanic White (n=527)**	**Caribbean Black (n=755)**	**African American (n=2,003)**	**p-value[a]**
Intrapersonal-level constructs[b]					
Stress	1.85 ± 1.56	1.49 ± 1.35	1.78 ± 1.53	1.96 ± 1.61	<.0001
Coping	15.22 ± 3.86	15.29 ± 3.71	14.98 ± 3.86	15.29 ± 3.90	0.16
Self-esteem	35.63 ± 4.35	35.28 ± 4.47	35.84 ± 4.13	35.64 ± 4.40	0.08
Interpersonal-level constructs[c]					
Major discrimination	1.36 ± 1.62	1.15 ± 1.39	1.34 ± 1.62	1.42 ± 1.67	0.002
Everyday discrimination	5.24 ± 6.53	3.20 ± 4.87	5.36 ± 6.88	5.75 ± 6.68	<.0001
Frequency of contact with informal sources	12.96 ± 3.97	13.33 ± 3.96	12.66 ± 3.78	12.99 ± 4.04	0.03
Social network ties	9.98 ± 1.61	9.9 ± 1.59	9.82 ± 1.59	10.06 ± 1.62	0.004
Social network size	6.15 ± 2.56	6.78 ± 2.58	5.54 ± 2.38	6.21 ± 2.58	<.0001

[a] p-values are based on the findings from the chi-squared and Fisher's exact tests for categorical variables and one-way ANOVA test for continuous variables, which depict the associations between the covariates and the three racial groups.
[b] Values represent n (%)
[c] Values represent the mean ± standard deviation

Findings from One-way ANOVA Analyses

Support from Informal Sources

Mean differences derived from the ANOVA analyses are the difference between the mean score values of one racial group and the mean score values from another racial group. A racial group with a positive mean value indicates that their overall mean score for a variable was higher compared to another racial group. Alternatively, a racial group with a negative mean value indicates that their overall mean score was lower for that variable when compared to another racial group. Both African Americans and Caribbean Blacks displayed less support from friends compared to non-Hispanic whites (mean difference= -0.10 and -0.12 units on a 1 to 3 scale respectively) (see Table 5). However, African Americans displayed more support from church members compared to Caribbean Blacks (mean difference=0.08). The mean difference for support from fictive kin among Caribbean Blacks compared to non-Hispanic whites was at a value of -0.12, indicating the mean score for support from fictive kin among Caribbean Blacks was less than the mean score for non-Hispanic whites. Alternatively, African Americans displayed more support from fictive kin compared to Caribbean Blacks (mean difference=0.09).

Positive and Negative Social Support

African Americans had more positive support from church members compared to Caribbean Blacks based on the mean difference value of 0.45 on a 3 to 9 scale (see Table 5). Alternatively, a lower amount of positive support from church members was observed among Caribbean Blacks compared to non-Hispanic whites (mean difference= -0.32). Both African Americans and Caribbean Blacks perceived more negative support from family (mean difference=0.34 and 0.26, respectively) and church members (mean difference=0.29 and 0.18, respectively) compared to non-Hispanic whites. Furthermore, the mean difference for negative

support from church members among African Americans compared to Caribbean Blacks was at a value of 0.12, indicating the mean score for negative support from church members was greater among African Americans compared to Caribbean Blacks.

QOL Domains

Positive mean differences were observed for psychological well-being among African Americans and Caribbean Blacks when compared to non-Hispanic whites (mean difference=0.33 and 0.50, on a 1 to 2 scale respectively) (see Table 6). In addition to this, the overall social well-being mean score was greater among Caribbean Blacks compared to non-Hispanic whites as evidenced by a mean difference of 0.09 on a 1 to 2 scale. African Americans and Caribbean Blacks displayed a higher overall mean for spiritual well-being (mean difference=0.35 and 0.25, on a 2 to 8 scale respectively) and overall QOL (mean difference=0.71 and 0.87, one a 12 to 29 scale respectively) compared to non-Hispanic whites.

Intrapersonal-level and Interpersonal-level constructs

The overall mean score for stress was greater among African Americans (mean differences=0.47 on a 0 to 9 scale) and Caribbean Blacks (mean differences=0.29) when compared to non-Hispanic whites (see Table 7). The overall mean score for major discrimination was greater among African Americans compared to non-Hispanic whites (mean difference=0.28 on a 0 to 8 scale). Everyday discrimination mean scores were greater among African Americans (mean difference=2.55 on a 0 to 40 scale) and Caribbean Blacks (mean difference=2.17) compared to non-Hispanic whites. Frequency of contact with informal sources was lower among Caribbean Blacks compared to non-Hispanic whites based on the mean difference value of -0.67 on a 0 to 20 scale. Greater means for social network ties and social network size were observed among African Americans compared to Caribbean Blacks (mean difference=0.24 on a 4 to 12

scale and 0.68, on a 3 to 12 scale respectively). Alternatively, lower means for social network size were observed for African Americans (mean difference= -0.56) and Caribbean Blacks (mean difference= -1.24) compared to non-Hispanic whites.

Table 5: One-way ANOVA Analysis on Factors of Social Support by Race (n=3,285)

	African American v. non-Hispanic white[a]	Caribbean Black v. non-Hispanic white[a]	African American v. Caribbean Black[a]	p-value[b]
Informal Sources of Support				
Support from family	-0.03	-0.09	0.06	0.13
Support from friends	-0.10[c]	-0.12[c]	0.01	0.01
Support from church members	0.02	-0.06	0.08[c]	0.06
Support from fictive kin	-0.03	-0.12[c]	0.09[c]	0.02
Informal Sources of Positive Support				
Positive support from family	-0.04	-0.13	0.10	0.39
Positive support from church members	0.14	-0.32[c]	0.45[c]	<.0001
Informal Sources of Negative Support				
Negative support from family	0.34[c]	0.26[c]	0.09	<.0001
Negative support from church members	0.29[c]	0.18[c]	0.12[c]	<.0001

[a] Values within each column indicate the mean difference between racial groups
[b] p-value of F-tests
[c] Racial group differences are significant at the 0.05 level

Table 6: One-way ANOVA Analysis on Quality of Life (QOL) Domains by Race (n=3,285)

	African American v. non-Hispanic white[a]	Caribbean Black v. non-Hispanic white[a]	African American v. Caribbean Black[a]	p-value[b]
Physical well-being	-0.05	0.05	-0.09	0.11
Psychological well-being	0.33[c]	0.50[c]	-0.17	0.001
Social well-being	0.04	0.09[c]	-0.04	0.01
Spiritual well-being	0.35[c]	0.25[c]	0.09	<.0001
Overall QOL	0.71[c]	0.87[c]	-0.16	<.0001

[a] Values within each column indicate the mean difference between racial groups
[b] p-value of F-tests
[c] Racial group differences are significant at the 0.05 level

Table 7: One-way ANOVA Analysis on the Intrapersonal-level and Interpersonal-level constructs by Race (n=3,285)

	African American v. non-Hispanic white[a]	Caribbean Black v. non-Hispanic white[a]	African American v. Caribbean Black[a]	p-value[b]
	Intrapersonal-level constructs			
Stress	0.47[c]	0.29[c]	0.18[c]	<.0001
Coping	0.01	-0.31	0.31	0.16
Self-esteem	0.36	0.56	-0.20	0.08
	Interpersonal-level constructs			
Major discrimination	0.28[c]	0.19	0.09	0.002
Everyday discrimination	2.55[c]	2.17[c]	0.39	<.0001
Frequency of contact	-0.34	-0.67[c]	0.32	0.03
Social network ties	0.15	-0.08	0.24[c]	0.004
Social network size	-0.56[c]	-1.24[c]	0.68[c]	<.0001

[a] Values within each column indicate the mean difference between racial groups

[b] p-value of F-tests

[c] Racial group differences are significant at the 0.05 level

Results for Aim 1

Results from Testing for Confounders

A total of 40 confounding analyses were conducted. Of the nine demographic variables, age, race, and income were the most frequent demographic variables identified as confounders. More specifically, age was a confounder within 24 associations. Race was a confounder within 20 associations, and income was a confounder within 18 associations.

Results from Moderation Analysis

Stress was found to be a marginally significant intrapersonal-level moderator of the relationship between support from fictive kin and psychological well-being (β=-0.10, p=0.05) (see Table 8). The F statistic for this model was also significant (F-value=30.36, p<0.0001). The intrapersonal-level variable, self-esteem, also significantly moderated the relationship between positive support from church members and social well-being (β=0.01, p=0.01, F-value=12.72, p<0.0001). The Johnson-Neyman technique was conducted for the frequent intrapersonal-level and interpersonal-level moderators (stress, self-esteem, social ties, and every day discrimination). Using this technique, it was observed that when stress was at a value of 1.8 or greater, support from fictive kin appeared to decrease the psychological well-being of study participants. Positive support from church members also appeared to increase participant's social well-being when self-esteem was at a value of 37.5 or greater.

Social ties and everyday discrimination were frequent interpersonal-level moderators of the relationships between factors of social support and QOL. Social ties moderated 11 of the 40 associations, making it the most frequent moderator. Social ties displayed a positive moderating effect on the relationship between support from friends and three QOL domains: social well-being (β=0.04, p=0.01, F-value=9.67, p<0.0001), spiritual well-being (β=0.10, p=0.02, F-

value=4.55, p<0.0001), and overall QOL (β=0.18, p=0.02, F-value=24.49, p<0.0001). As a result, as social ties increased, the more positive the effect of support from friends on social well-being, spiritual well-being, and overall QOL. Everyday discrimination negatively moderated 5 of the 40 associations. An increase in everyday discrimination experiences, resulted in a reduction in the effect of specific factors of social support and the QOL among individuals with chronic illnesses. The Johnson-Neyman technique also identified that at a value of 8.4 or lower for social ties, support from friends reduced the spiritual well-being among individuals with chronic illnesses. Lastly when every day discrimination was at a value of 19.6 or lower, positive support from church members appeared to increase the spiritual well-being of study participants.

Table 8: Beta Coefficients for the Interaction Terms for Intrapersonal-level and Interpersonal-level Constructs[a]

	Physical well-being	Psychological well-being	Social well-being	Spiritual well-being	Overall QOL
Support from family					
x Everyday discrimination	-0.02**	--	--	--	--
x Frequency of contact	--	-0.05*	--	--	0.08**
Support from friends					
x Everyday discrimination	-0.01*	-0.04*	--	--	-0.06**
x Social ties	--	--	0.04**	0.10*	0.18*
x Size of network	--	0.08*	0.02**	--	--
Support from church members	--	--	--	--	--
Support from fictive kin					
x Stress	--	-0.10*	--	--	--
x Social ties	-0.05*	0.12*	--	--	0.17*
x Size of network	--	0.07*	--	--	--
Positive support from family					
x Social ties	--	--	0.01*	0.03*	--

Table 8 (Continued)

	Physical well-being	Psychological well-being	Social well-being	Spiritual well-being	Overall QOL
Positive support from church members					
x Self esteem	--	--	0.01*	--	--
x Everyday discrimination	--	--	--	-0.01*	--
x Social ties	--	--	--	0.03*	--
x Size of network	--	--	--	0.03*	--
Negative support from family					
x Social ties	--	--	--	-0.04***	--
Negative support from church members					
x Frequency of contact	0.01*	--	--	-0.01*	--
x Social ties	0.04*	--	--	--	--

*p<.05, **p<.01, ***p<.0001

[a] Moderating analyses were assessed by testing interaction terms within the complete case analyses. All models were controlled for the following variables: gender (reference: males), race (reference: non-Hispanic whites), age (reference: less than 29 years), income (reference: less than $19,000), education (reference: between 0-11 years), marital status (reference: married/cohabiting),employment (reference-employed), length of state in the U.S. (reference: U.S. born), insurance (reference: insured), stress, coping, self-esteem, major discrimination, everyday discrimination, frequency of contact, social network ties, and size of social network

Results from Mediation Analysis

Stress was the most common intrapersonal-level mediator (12 of the 40 associations). For example, stress mediated the association between negative social support from family and three QOL domains: physical well-being (β= -0.02, 95% CI= -0.03, -0.01), psychological well-being (β= -0.06, 95% CI= -0.08, -0.04), and social well-being (β= -0.02, 95% CI= -0.03, -0.01) as well as overall QOL (β= -0.09, 95% CI= -0.12, -0.06). The variable, social ties, was observed as being the most common mediator overall (14 out of 40 associations). Results from the mediation analyses are available in Table 6.

Summary of Results for Aim 1

In summary, the analyses from study aim 1 revealed that stress and social ties appeared to consistently moderate and mediate the relationships between factors of social support and the QOL among individuals with chronic illnesses. Moreover, different intrapersonal-level and interpersonal-level constructs were shown to be moderators and mediators within the relationships between factors of social support and the QOL domains among individuals with chronic illnesses. Due to the cross-sectional design of this study, it is uncertain as to which intrapersonal-level and interpersonal-level constructs should be classified as moderators or mediators. Yet the findings from these moderation and mediation analyses may provide insight into the specifics of the association between factors of social support (i.e., informal sources of social support and positive and negative social support) and the QOL among individuals with chronic illnesses. The analyses for study aims 2 and 3 include both the unadjusted associations (i.e., the crude associations) as well as the adjusted associations (i.e., models include all covariates and factors of social support). By comparing both the unadjusted and adjusted models, the effects of the covariates could be assessed.

Table 9: Indirect Effect Coefficients for Intrapersonal-level and Interpersonal-level Constructs[a]

	Physical well-being	Psychological well-being	Social well-being	Spiritual well-being	Overall QOL
Support from family					
Mediators					
Everyday discrimination	--	0.01[b]	0.01[b]	--	0.004[b]
Frequency of contact	--	--	0.01[b]	0.003[b]	0.01[b]
Social ties	--	--	--	0.02[b]	0.03[b]
Support from friends					
Mediators					
Stress	--	--	-0.01[b]	--	--
Frequency of contact	--	--	--	-0.01[b]	0.02[b]
Social ties	--	--	--	0.02[b]	0.03[b]
Support from church members					
Mediators					
Coping	--	-0.02[b]	-0.01[b]	--	-0.02[b]
Self-esteem	--	0.01[b]	--	0.003	0.04[b]
Frequency of contact	--	--	--	0.0004[b]	0.01[b]
Social ties	--	--	--	0.03[b]	0.04[b]
Support from fictive kin					
Mediators					
Frequency of contact	--	--	--	-0.10[b]	0.02[b]
Social ties	--	--	--	0.03[b]	0.05[b]
Positive support from family					
Mediators					
Major discrimination	--	0.01[b]	--	-0.002[b]	0.01[b]
Everyday discrimination	--	0.01[b]	0.01[b]	--	0.01[b]
Social ties	--	--	--	0.03[b]	0.03[b]

Table 9 (Continued)

	Physical well-being	Psychological well-being	Social well-being	Spiritual well-being	Overall QOL
Positive support from church members					
Mediators					
Stress	-0.01[b]	--	-0.01[b]	--	-0.01[b]
Everyday discrimination	--	-0.01[b]	-0.01b	--	-0.01
Social ties	--	--	--	0.02[b]	0.03[b]
Frequency of contact	--	--	--	--	0.01[b]
Negative support from family					
Mediators					
Stress	-0.01[b]	-0.06[b]	-0.02[b]	--	-0.03[b]
Everyday discrimination	--	-0.01[b]	-0.02[b]	--	--
Social ties	--	--	--	-0.01[b]	-0.01[b]
Negative support from church members					
Mediators					
Stress	-0.02[b]	-0.06[b]	-0.02[b]	--	-0.08[b]
Self-esteem	-0.01[b]	-0.02[b]	-0.01[b]	-0.003[b]	-0.03[b]
Everyday discrimination	--	-0.01[b]	-0.02[b]	--	-0.01[b]
Frequency of contact	--	--	--	0.002[b]	0.01[b]

[a] Results were calculated using the PROCESS MACRO indirect syntax (Hayes, 2013). The unstandardized estimates of the indirect effect are based on 5,000 bootstrap resamples. Each model was adjusted for the following covariates: gender, race, age, income, education, marital status, employment, length of state in the U.S., insurance, stress, coping, self-esteem, major discrimination, everyday discrimination, frequency of contact, social network ties, and size of social network.

[b] Represent zero not being included in the bias-corrected 95% confidence intervals

Results for Aims 2

All findings related to study aims 2 and 3 are available in Tables 10-19. The F-tests for each of the four models displayed an overall significance of $p<.0001$. Model 1 is based on findings from the crude association between factors of social support and the QOL domains among individuals with chronic illnesses. The complete case analyses within model 2 were adjusted for informal sources of social support as well as covariates (demographic variables, intrapersonal-level constructs, and interpersonal level-variables). The complete case analyses for model 3 contained the same variables as model 2; however, this model also included the interaction terms for race and informal sources of social support. Model 4 contained the same variables and interaction terms as model 3 and included multiple imputation analyses. Due to the overall goal of this study, only the interaction terms between race and the factors of social support (i.e., informal sources of social support and positive and negative sources of social support) were included in models 3 and 4. The findings below assess the associations between sources of informal social support (family, friends, church members, and fictive kin) and QOL domains among individuals with chronic illnesses.

Multiple imputation analyses (model 4) were the primary analyses assessed within this study. As a result, the interpretation of the results is based on associations observed from the multiple imputation analyses. The findings from the multiple imputation analyses also assessed whether racial differences exist among associations of informal sources of social support and the QOL domains among individuals with chronic illnesses. Moreover, the patterns of the associations between these variables were assessed by stratifying the study sample by race after conducting the multiple imputation analyses.

Physical well-being

Racial differences were observed after conducting the multiple imputation analyses. More specifically, a negative association was observed between support from family and the physical well-being of African Americans with chronic illnesses when compared to non-Hispanic whites (β=-0.18, p=<.0001) (see Table 10). Specifically, support from family was positively associated with physical well-being among non-Hispanic whites (β=0.18, p=0.02), but not for African Americans (β= -0.02, p=0.44) or Caribbean Blacks (β= -0.06, p=0.26) (see Table 11). Similarly, greater support from friends was associated with a lower physical well-being score among African Americans compared to non-Hispanic whites (β= -0.09, p=0.04). After stratifying the study sample, it was observed that support from friends was positively associated with physical well-being among non-Hispanic whites (β=0.13, p=0.04), but not for African Americans (β= -0.003, p=0.83) or Caribbean Blacks (β= -0.004, p=0.95). In terms of the associations between informal sources of social support and the physical well-being within the overall study sample, support from family was positively associated with physical well-being after conducting the multiple imputation analysis (β=0.17, p=<.0001).

Psychological well-being

Race did not moderate the relationship between informal sources of social support and the psychological well-being (see Table 12). A negative association was observed between support from family and psychological-well-being among Caribbean Blacks (β= -0.24, p=0.02) (see Table 13). The association between support from family and psychological well-being among African Americans and non-Hispanic whites was also negative, but not statistically significant (African Americans: β= -0.01, p=0.82; non-Hispanic whites: β= -0.03, p=0.86). As a result, no racial differences were observed between informal sources of social support and the

psychological well-being among individuals with chronic illnesses. No statistically significant associations were observed between informal sources of social support and the psychological well-being among individuals with chronic illnesses.

Social well-being

Racial differences were observed between factors of informal sources of social support and the social well-being among individuals with chronic illnesses after conducting the multiple imputation analyses (see Table 14). Support from family members was negatively associated with social well-being among both Caribbean Blacks (β= -0.16, p=0.002) and African Americans (β= -0.04, p=0.02) when compared to non-Hispanic whites. The association between non-Hispanic whites and social well-being was positive, but not statistically significant (see Table 15). A positive association was observed between support from friends and the social well-being of the study participants (β= 0.04, p=0.02). Moreover, support from church members was negatively associated with the social well-being among individuals with chronic illnesses (β= -0.08, p=0.002).

Spiritual well-being

Findings from the multiple imputation analysis revealed that a negative association between support from friends and the spiritual well-being among African Americans when compared to non-Hispanic whites (β= -0.14, p=0.02) (see Table 16). When the study sample was stratified by race, a non-significant positive association was observed between support from friends and spiritual well-being among African Americans and Caribbean Blacks (see Table 17). Alternatively, a non-significant negative association was observed between support from family and spiritual well-being among non-Hispanic whites. There were no additional racial differences

observed between factors of informal sources of social support and the spiritual well-being among individuals with chronic illnesses.

Overall QOL

Table 18 depicts the findings from the complete case and multiple imputation analyses testing the associations between factors of social support and the overall QOL of participants within this study. Based on the multiple imputation analyses, both support from family (β= -0.29, p=0.03) and support from friends (β= -0.39, p=0.003) were negatively associated with the overall QOL among African Americans when compared to non-Hispanic whites. A non-significant negative association was observed between support from family and overall QOL among both African Americans and Caribbean Blacks (see Table 19). A positive association was observed between support from family and overall QOL among non-Hispanic whites, but the results were also non-significant. Both African Americans and non-Hispanic whites displayed a non-significant association between support from friends and overall QOL. However, Caribbean Blacks displayed a non-significant negative association between support from friends and overall QOL. The multiple imputation analyses in Table 18 also revealed a significant association between support from both family (β= -0.22, p=0.02) as well as friends (β=0.39, p=0.001) and the spiritual well-being of all study participants.

Patterns of the Association

Tables 11, 13, 15, 17, and 19 also depict the patterns of the associations between informal sources of social support and QOL. By observing the beta estimates within these associations, there is evidence the patterns of association differ among individuals of African descent compared to non-Hispanic whites. For example, non-significant negative associations were observed between support from family and physical well-being among both African Americans

and Caribbean Blacks (see Table 11). However, a significantly positive association was observed between support from family and physical well-being among non-Hispanic whites (β=0.18, p=0.02).

Results for Aim 3

The purpose of study aim 3 was to examine associations between informal sources (family and church members) of positive and negative social support and QOL domains among individuals with chronic illnesses. Results from both the complete case and multiple imputation analyses assessed the association between these variables. These analyses also tested the hypothesis that racial differences exist across informal sources of positive and negative social support and both the four QOL domains as well as the overall QOL. More specifically, multiple imputations analyses allowed for the patterns of associations between both positive and negative social support and the QOL domains among individuals of African descent and non-Hispanic whites to be assessed.

Physical well-being

Race was not found to be a moderator in the relationship between positive and negative sources of social support and the physical well-being of individuals with chronic illnesses. Moreover, no statistically significant associations were observed between informal sources of positive and negative social support and physical well-being (see Table 10).

Psychological well-being

Significant racial differences were observed between negative support from family and the psychological well-being among African Americans compared to non-Hispanic whites (β= -0.12, p=0.01) (see Table 12). By stratifying the study sample, a negative association was observed between negative support from family and psychological well-being among African

Americans (β= -0.09, p=.004) and Caribbean Blacks (-0.15, p=0.01) (see Table 13). A non-significant positive association was observed between negative support from family and psychological well-being among non-Hispanic whites. Positive support from church members was negatively associated with the psychological well-being of study participants after conducting the multiple imputation analysis (β= -0.06, p=0.02).

Social well-being

By conducting the multiple imputation analysis, only significant racial differences were observed between negative support from family and the social well-being of African Americans compared to whites (β= -0.03, p=0.01) (see Table 14). More specifically, both African American and Caribbean Blacks displayed a non-significant negative association between negative support from family and social well-being (see Table 15). However, a positive association was observed between negative support from family and social well-being among non-Hispanic whites (β=0.04, p=0.02). Negative support from family was also positively associated with the social well-being among study participants (β= 0.03, p=0.001).

Spiritual well-being

After conducting the multiple imputation analyses, a negative association was observed between positive support from church members and the spiritual well-being of Caribbean Blacks (β= -0.23, p=0.003) and African Americans (β= -0.15, p=<.0001) when compared to non-Hispanic whites (see Table 16). Once the study sample was stratified, a positive association was observed between positive support from church members and spiritual well-being among African Americans (β=0.12, p=0.001) (see Table 17). Positive associations were also observed between positive support from church members and spiritual well-being among both non-Hispanic whites and Caribbean Blacks; however, the results were not significant for these associations. A

significant association was observed between negative support from church members and spiritual well-being among African Americans when compared to non-Hispanic whites (β= -0.20, p=<.0001). A non-significant positive association was observed between negative support from church members and spiritual well-being among non-Hispanic whites and Caribbean Blacks. Alternatively, a non-significant negative association was observed between negative support from church members and spiritual well-being among African Americans. Within the overall study sample, a positive association was observed between positive support from church members and spiritual well-being (β=0.20, p<.0001).

Overall QOL

Race did not moderate the relationship between negative support from church members and overall QOL within the multiple imputation analyses (see Table 18). In addition to this, no significant association were observed between either positive or negative support from family/church members and the overall QOL among individuals with chronic illnesses.

Patterns of association

Differences in the patterns of associations were observed between both positive and negative support from family/church members and specific QOL domains. Differences in the patterns of association between positive and negative support from family/church members and three QOL domains (psychological well-being, social well-being, and spiritual well-being) as well as overall QOL were observed among individuals of African descent compared to non-Hispanic whites (see Tables 11, 13, 15, 17, and 19).

Summary of Results from Aim 2 and 3

Findings from both the results from study 2 and 3 provide evidence that there are racial differences within the associations between factors of social support and the QOL domains

among individuals with chronic illnesses. More racial differences were observed among African Americans compared to Caribbean Blacks. It was also observed that association between specific factors of social support (i.e., informal sources of social support and positive and negative social support) and the QOL among individuals of African descent compared to non-Hispanic whites differed in 16 of the 40 associations assessed with this study.

Table 10: Coefficients for the Association between Factors of Social Support and Physical Well-being

	Model 1 Estimates[b]	Model 2 Estimates[a,c]	Model 3 Estimates[a,d]	Model 4 Estimates[a,e]
Support from family	0.12**	0.07	0.14	0.17***
x Caribbean Blacks	--	--	-0.17	-0.17
x African American	--	--	-0.13	-0.18***
R^2	0.01	0.26	0.26	0.25
Support from friends	0.08	0.07	0.13	0.10**
x Caribbean Blacks		--	-0.003	-0.08
x African American		--	-0.11	-0.09*
R^2	0.003	0.26	0.26	0.24
Support from church members	0.03	0.01	0.05	-0.3
x Caribbean Blacks	--	--	-0.09	0.01
x African American	--	--	-0.05	0.06
R^2	0.0006	0.25	0.25	0.24
Support from fictive kin	0.05	0.07	0.17	-0.07
x Caribbean Blacks	--	--	-0.11	-0.13
x African American	--	--	-0.18	-0.06
R^2	0.002	0.25	0.25	0.22

Table 10 (Continued)

	Model 1 Estimates[b]	**Model 2 Estimates[a,c]**	**Model 3 Estimates[a,d]**	**Model 4 Estimates[a,e]**
Positive support from family	0.04*	0.01	0.02	-0.01
x Caribbean Blacks	--	--	0.01	-0.02
x African American	--	--	-0.02	-0.004
R^2	0.01	0.25	0.25	0.24
Positive support from church members	0.001	0.01	0.01	-0.03
x African American	--	--	0.003	-0.03
R^2	.000001	0.25	0.25	0.24
Negative support from family	-0.08***	0.01	-0.01	-0.03
x Caribbean Blacks	--	--	-0.03	-0.02
x African American	--	--	0.03	-0.03
R^2	0.01	0.26	0.26	0.24
Negative support from church members	-0.02	0.03	0.02	-0.04
x Caribbean Blacks	--	--	-0.05	0.03
x African American	--	--	0.02	0.09
R^2	0.0002	0.25	0.25	0.24

Table 10 (Continued)

	Model 1 Estimates[b]	**Model 2 Estimates[a,c]**	**Model 3 Estimates[a,d]**	**Model 4 Estimates[a,e]**

*p<0.05, **p<0.01, ***p<.0001

[a] all models are adjusted for the following covariates: gender (reference: males), race (reference: non-Hispanic whites), age (reference: less than 29 years), income (reference: less than $19,000), education (reference: between 0-11 years), marital status (reference: married/cohabiting),employment (reference-employed), length of stay in the U.S. (reference: U.S. born), insurance (reference: insured), stress, coping, self-esteem, major discrimination, everyday discrimination, frequency of contact, social network ties, and size of social network.

[b] Model 1: contains the factor of social support (crude association)

[c] Model 2: adjusted for covariates and factors of social support

[d] Model 3: adjusted for covariates, factors of social support, and interaction terms

[e] Model 4: adjusted for covariates, factors of social support, and interaction terms. Coefficients are based on results from multiple imputation analyses conducted in SAS.

Table 11: Coefficients for the Association between Factors of Social Support and Physical Well-being Stratified by Race[a]

	Non-Hispanic white (n=527)	African American (n=2,003)	Caribbean Black (n=755)
Support from family[b]	0.18**	-0.02	-0.06
Support from friends[b]	0.13*	-0.003	-0.004
Support from church members[b]	-0.001	0.01	0.01
Support from fictive kin[b]	0.09	-0.02	-0.08
Positive support from family	-0.01	0.001	-0.01
Positive support from church members	-0.01	0.01	-0.05
Negative support from family	0.06	0.02	-0.04
Negative support from church members	-0.001	0.02	-0.06

*p<.05, **p<.01, ***p<.0001

[a] Each association was adjusted for covariates and factors of social support. Coefficients are based on results from multiple imputation analyses conducted in SAS.

[b] Suggest potential differences in the pattern of association between individuals of African descent (i.e. African American and Caribbean Blacks) and non-Hispanic whites.

Table 12: Coefficients for the Association between Factors of Social Support and Psychological Well-being

	Model 1 Estimates[b]	Model 2 Estimates[a,c]	Model 3 Estimates[a,d]	Model 4 Estimates[a,e]
Support from family	-0.004	-0.12	-0.19	0.01
x Caribbean Blacks	--	--	-0.08	-0.37
x African American	--	--	0.14	-0.04
R^2	.000001	0.33	0.33	0.33
Support from friends	0.04	0.02	0.08	0.14
x Caribbean Blacks	--	--	-0.30	-0.22
x African American	--	--	-0.11	-0.15
R^2	0.0002	0.33	0.33	0.33
Support from church members	-0.05	0.03	0.09	-0.06
x Caribbean Blacks	--	--	-0.10	-0.03
x African American	--	--	-0.12	0.02
R^2	0.0002	0.33	0.33	0.33
Support from fictive kin	-0.07	-0.10	-0.08	0.02
x Caribbean Blacks	--	--	0.04	0.02
x African American	--	--	-0.03	-0.03
R^2	0.001	0.34	0.34	0.32

Table 12 (Continued)

	Model 1 Estimates[b]	**Model 2 Estimates[a,c]**	**Model 3 Estimates[a,d]**	**Model 4 Estimates[a,e]**
Positive support from family	0.07*	-0.06	-0.10	-0.07
x Caribbean Blacks	--	--	-0.05	-0.12
x African American	--	--	0.07	0.07
R^2	0.003	0.33	0.33	0.33
Positive support from church members	-0.004	-0.03	-0.03	-0.06*
x Caribbean Blacks	--	--	-0.29*	0.22
x African American	--	--	-0.01	0.03
R^2	0.00001	0.33	0.33	0.33
Negative support from family	-0.036***	-0.05	-0.05	0.02
x Caribbean Blacks	--	--	0.49	-0.18
x African American	--	--	-0.01	-0.12*
R^2	0.05	0.33	0.33	0.33

Table 12 (Continued)

	Model 1 Estimates[b]	**Model 2 Estimates[a,c]**	**Model 3 Estimates[a,d]**	**Model 4 Estimates[a,e]**
Negative support from church members	-0.14	0.11	0.43*	0.07
x Caribbean Blacks	--	--	-0.48*	-0.16
x African American	--	--	-0.42*	-0.07
R^2	0.003	0.33	0.33	0.33

*p<0.05, **p<0.01, ***p<.0001

[a] all models are adjusted for the following covariates: gender (reference: males), race (reference: non-Hispanic whites), age (reference: less than 29 years), income (reference: less than $19,000), education (reference: between 0-11 years), marital status (reference: married/cohabiting),employment (reference-employed), length of stay in the U.S. (reference: U.S. born), insurance (reference: insured), stress, coping, self-esteem, major discrimination, everyday discrimination, frequency of contact, social network ties, and size of social network.

[b] Model 1: contains the factor of social support (crude association)

[c] Model 2: adjusted for covariates and factors of social support

[d] Model 3: adjusted for covariates, factors of social support, and racial interaction terms

[e] Model 4: adjusted for covariates, factors of social support, and interaction terms. Coefficients are based on results from multiple imputation analyses conducted in SAS.

Table 13: Coefficients for the Association between Factors of Social Support and Psychological Well-being Stratified by Race[a]

	Non-Hispanic white (n=527)	African American (n=2,003)	Caribbean Black (n=755)
Support from family	-0.03	-0.01	-0.24*
Support from friends[b]	0.13	-0.03	-0.13
Support from church members	-0.01	-0.04	-0.05
Support from fictive kin	-0.09	-0.03	-0.03
Positive support from family	-0.09	-0.0002	-0.21**
Positive support from church members	-0.01	-0.05	0.14*
Negative support from family[b]	0.03	-0.09**	-0.15*
Negative support from church members[b]	0.11	-0.01	-0.17

*p<.05, **p<.01, ***p<.0001

[a] Each association was adjusted for covariates and factors of social support. Coefficients are based on results from multiple imputation analyses conducted in SAS.

[b] Suggest potential differences in the pattern of association between individuals of African descent (i.e. African American and Caribbean Blacks) and non-Hispanic whites.

Table 14: Coefficients for the Association between Factors of Social Support and Social Well-being

	Model 1 Estimates[b]	Model 2 Estimates[a,c]	Model 3 Estimates[a,d]	Model 4 Estimates[a,e]
Support from family	-0.01	-0.04*	-0.04	0.02
x Caribbean Blacks	--	--	-0.11	-0.16**
x African American	--	--	-0.01	-0.04*
R^2	0.0002	0.17	0.17	0.17
Support from friends	0.02	0.01	-0.01	0.04*
x Caribbean Blacks	--	--	-0.09	-0.10
x African American	--	--	0.05	-0.01
R^2	0.001	0.17	0.17	0.18
Support from church members	-0.04	-0.004	-0.01	-0.08**
x Caribbean Blacks	--	--	0.06	0.04
x African American	--	--	0.02	0.05
R^2	0.003	0.16	0.17	0.17
Support from fictive kin	-0.02	0.01	0.01	-0.01
x Caribbean Blacks	--	--	-0.12	-0.07
x African American	--	--	0.01	0.03
R^2	0.001	0.16	0.16	0.17

Table 14 (Continued)

	Model 1 Estimates[b]	**Model 2 Estimates[a,c]**	**Model 3 Estimates[a,d]**	**Model 4 Estimates[a,e]**
Positive support from family	0.01	-0.01	-0.01	-0.005
x Caribbean Blacks	--	--	-0.002	-0.03
x African American	--	--	0.01	0.01
R^2	0.001	0.16	0.16	0.17
Positive support from church members	0.003	0.01	0.004	-0.01
x Caribbean Blacks	--	--	0.04	0.02
x African American	--	--	0.01	0.02
R^2	0.0001	0.16	0.16	0.17
Negative support from family	-0.03**	-0.004	-0.01	0.03**
x Caribbean Blacks	--	--	-0.05	-0.04
x African American	--	--	0.01	-0.03*
R^2	0.01	0.16	0.16	0.17

Table 14 (Continued)

	Model 1 Estimates[b]	**Model 2 Estimates[a,c]**	**Model 3 Estimates[a,d]**	**Model 4 Estimates[a,e]**
Negative support from church members	-0.01	0.01	-0.01	-0.03
x Caribbean Blacks	--	--	-0.05	0.04
x African American	--	--	0.01	0.03
R^2	0.0003	0.16	0.16	0.17

$^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<.0001$

[a] all models are adjusted for the following covariates: gender (reference: males), race (reference: non-Hispanic whites), age (reference: less than 29 years), income (reference: less than $19,000), education (reference: between 0-11 years), marital status (reference: married/cohabiting),employment (reference-employed), length of stay in the U.S. (reference: U.S. born), insurance (reference: insured), stress, coping, self-esteem, major discrimination, everyday discrimination, frequency of contact, social network ties, and size of social network.

[b] Model 1: contains the factor of social support (crude association)

[c] Model 2: adjusted for covariates and factors of social support

[d] Model 3: adjusted for covariates, factors of social support, and interaction terms

[e] Model 4: adjusted for covariates, factors of social support, and racial interaction terms. Coefficients are based on results from multiple imputation analyses conducted in SAS.

Table 15: Coefficients for the Associations between Factors of Social Support and Social Well-being Stratified by Race[a]

	Non-Hispanic white (n=527)	African American (n=2,003)	Caribbean Black (n=755)
Support from family[b]	0.03	-0.02	-0.16***
Support from friends	0.04	0.03*	-0.09**
Support from church members	-0.07	0.003	-0.01
Support from fictive kin	-0.01	0.02	-0.13**
Positive support from family	-0.01	0.01	-0.03*
Positive support from church members[b]	-0.003	0.02*	0.02
Negative support from family[b]	0.04*	-0.003	-0.01
Negative support from church members	-0.03	0.0002	-0.02

*p<.05, **p<.01, ***p<.0001

[a] Each association was adjusted for covariates and factors of social support. Coefficients are based on results from multiple imputation analyses conducted in SAS.

[b] Suggest potential differences in the pattern of association between individuals of African descent (i.e. African American and Caribbean Blacks) and non-Hispanic whites.

Table 16: Coefficients for the Association between Factors of Social Support and Spiritual Well-being

	Model 1 Estimates[b]	Model 2 Estimates[a,c]	Model 3 Estimates[a,d]	Model 4 Estimates[a,e]
Support from family	0.13	-0.02	0.03	-0.02
x Caribbean Blacks	--	--	-0.03	-0.01
x African American	--	--	-0.09	-0.02
R^2	0.01	0.20	0.20	0.26
Support from friends	0.18**	-0.04	0.002	0.10
x Caribbean Blacks	--	--	0.07	-0.15
x African American	--	--	-0.09	-0.14*
R^2	0.01	0.20	0.20	0.26
Support from church members	0.31***	0.16**	0.27**	0.19
x Caribbean Blacks	--	--	-0.21	-0.26
x African American	--	--	-0.19	-0.18
R^2	0.04	0.21	0.21	0.24
Support from fictive kin	0.08	-0.07	-0.0004	0.06
x Caribbean Blacks	--	--	-0.09	-0.24
x African American	--	--	-0.13	-0.15
R^2	0.003	0.19	0.20	0.21

Table 16 (Continued)

	Model 1 Estimates[b]	**Model 2 Estimates[a,c]**	**Model 3 Estimates[a,d]**	**Model 4 Estimates[a,e]**
Positive support from family	0.10**	0.01	0.04	0.02
x Caribbean Blacks	--	--	-0.07	-0.03
x African American	--	--	-0.04	-0.02
R^2	0.02	0.20	0.20	0.20
Positive support from church members	0.19***	0.13***	0.19**	0.20***
x Caribbean Blacks	--	--	-0.18**	-0.23**
x African American	--	--	-0.11*	-0.15***
R^2	0.11	0.23	0.24	0.28
Negative support from family	-0.02	0.02	0.03	0.10
x Caribbean Blacks	--	--	-0.07	0.05
x African American	--	--	-0.02	-0.06
R^2	0.0005	0.20	0.20	0.26

Table 16 (Continued)

	Model 1 Estimates[b]	Model 2 Estimates[a,c]	Model 3 Estimates[a,d]	Model 4 Estimates[a,e]
Negative support from church members				
x Caribbean Blacks	--	--	-0.24*	-0.23
x African American	--	--	-0.23**	-0.20***
R^2	0.01	0.20	0.21	0.28

*p<0.05, **p<0.01, ***p<.0001

[a] all models are adjusted for the following covariates: gender (reference: males), race (reference: non-Hispanic whites), age (reference: less than 29 years), income (reference: less than $19,000), education (reference: between 0-11 years), marital status (reference: married/cohabiting),employment (reference-employed), length of stay in the U.S. (reference: U.S. born), insurance (reference: insured), stress, coping, self-esteem, major discrimination, everyday discrimination, frequency of contact, social network ties, and size of social network.

[b] Model 1: contains the factor of social support (crude association)

[c] Model 2: adjusted for covariates and factors of social support

[d] Model 3: adjusted for covariates, factors of social support, and racial interaction terms

[e] Model 4: adjusted for covariates, factors of social support, and interaction terms.

Coefficients are based on results from multiple imputation analyses conducted in SAS.

Table 17: Coefficients for the Associations between Factors of Social Support and Spiritual Well-being Stratified by Race[a]

	Non-Hispanic white (n=527)	African American (n=2,003)	Caribbean Black (n=755)
Support from family[b]	-0.13	0.03	0.09
Support from friends[b]	-0.09	0.01	0.04
Support from church members	0.12	0.08	0.07
Support from fictive kin	-0.04	-0.04	-0.07
Positive support from family[b]	-0.05	0.03	0.01
Positive support from church members	0.15	0.12**	0.01
Negative support from family[b]	-0.06	0.03*	0.07*
Negative support from church members	0.08	-0.03	0.02

*p<.05, **p<.01, ***p<.0001

[a] Each association was adjusted for covariates and factors of social support. Coefficients are based on results from multiple imputation analyses conducted in SAS.

[b] Suggest potential differences in the pattern of association between individuals of African descent (i.e. African American and Caribbean Blacks) and non-Hispanic whites.

Table 18: Coefficients for the Association between Factors of Social Support and Overall QOL

	Model 1 Estimates[b]	Model 2 Estimates[a,c]	Model 3 Estimates[a,d]	Model 4 Estimates[a,e]
Support from family	0.23	-0.06	0.02	0.22*
x Caribbean Blacks	--	--	-0.34	-0.57
x African American	--	--	-0.15	-0.29*
R^2	0.003	0.37	0.37	0.35
Support from friends	0.35*	0.07	0.28	0.39**
x Caribbean Blacks	--	--	-0.35	-0.47
x African American	--	--	-0.37	-0.39**
R^2	0.01	0.37	0.38	0.35
Support from church members	0.34*	0.20	0.43	0.02
x Caribbean Blacks	--	--	-0.20	-0.12
x African American	--	--	-0.40	-0.02
R^2	0.01	0.37	0.38	0.36
Support from fictive kin	0.06	-0.13	0.06	0.10
x Caribbean Blacks	--	--	-0.18	-0.25
x African American	--	--	-0.36	-0.18
R^2	0.0002	0.38	0.38	0.33

Table 18 (Continued)

	Model 1 Estimates[b]	**Model 2 Estimates[a,c]**	**Model 3 Estimates[a,d]**	**Model 4 Estimates[a,e]**
Positive support from family				
x Caribbean Blacks	--	--	-0.09	-0.13
x African American	--	--	0.04	0.07
R^2	0.01	0.37	0.37	0.35
Positive support from church members	0.21**	0.11	0.17	0.13
x Caribbean Blacks	--	--	0.13	0.04
x African American	--	--	-0.13	-0.07
R^2	0.02	0.38	0.38	0.35
Negative support from family	-0.51***	-0.03	-0.04	-0.08
x Caribbean Blacks	--	--	-0.39	-0.11
x African American	--	--	0.03	0.03
R^2	0.05	0.37	0.37	0.35
Negative support from church members	-0.05	0.24**	0.78**	-0.02
x Caribbean Blacks	--	--	-0.86**	-0.17
x African American	--	--	-0.72**	0.03
R^2	0.0002	0.38	0.38	0.35

Table 18 (Continued)

	Model 1 Estimates[b]	Model 2 Estimates[a,c]	Model 3 Estimates[a,d]	Model 4 Estimates[a,e]

*p<0.05, **p<0.01, ***p<0.0001

[a] all models are adjusted for the following covariates: gender (reference: males), race (reference: non-Hispanic whites), age (reference: less than 29 years), income (reference: less than $19,000), education (reference: between 0-11 years), marital status (reference: married/cohabiting),employment (reference-employed), length of stay in the U.S. (reference: U.S. born), insurance (reference: insured), stress, coping, self-esteem, major discrimination, everyday discrimination, frequency of contact, social network ties, and size of social network.

[b] Model 1: contains the factor of social support (crude association)

[c] Model 2: adjusted for covariates and factors of social support

[d] Model 3: adjusted for covariates, factors of social support, and racial interaction terms

[e] Model 4: adjusted for covariates, factors of social support, and interaction terms. Coefficients are based on results from multiple imputation analyses conducted in SAS.

Table 19: Coefficients for the Associations between Factors of Social Support and Overall Quality of Life (QOL) Stratified by Race[a]

	Non-Hispanic white (n=527)	African American (n=2,003)	Caribbean Black (n=755)
Support from family[b]	0.05	-0.01	-0.24
Support from friends	0.31	0.02	-0.03
Support from church members	0.13	0.01	-0.06
Support from fictive kin	-0.08	-0.04	-0.05
Positive support from family	-0.15	0.05	-0.26***
Positive support from church members	0.17	0.04	0.12
Negative support from family	-0.11	-0.06	-0.18*
Negative support from church members[b]	0.18	-0.01	-0.25

*p<.05, **p<.01, ***p<.0001

[a] Each association was adjusted for covariates and factors of social support. Coefficients are based on results from multiple imputation analyses conducted in SAS.

[b] Suggest potential differences in the pattern of association between individuals of African descent (i.e. African American and Caribbean Blacks) and non-Hispanic whites.

CHAPTER 5: DISCUSSION

The purpose of this dissertation was to assess racial differences in the associations between factors of social support (i.e., informal sources of social support as well as positive and negative social support) and the QOL domains among individuals with chronic illnesses. By conducting a secondary data analysis using the NSAL dataset, it was determined that race moderated the associations between specific factors of social support and QOL domains among individuals with chronic illnesses. Moreover, differences in the patterns of these associations by race were observed. The results of this study also highlight potential intrapersonal-level and interpersonal-level moderators and mediators that may impact associations between factors of social support and the QOL among individuals with chronic illnesses.

Regarding the demographics of the study sample, findings from the ANOVA analyses found support from friends was significantly lower among both African Americans and Caribbean Blacks compared to non-Hispanic whites. Moreover, African Americans indicated they perceived significantly more support from church members compared to Caribbean Blacks. These findings are consistent with a cross-sectional study, which also observed a higher frequency of support from friends among non-Hispanic whites compared to African Americans and Caribbean Blacks (Taylor et al., 2013). This same study also observed a higher frequency of congregational support among African Americans when compared to non-Hispanic whites and Caribbean Blacks (Taylor et al., 2013). Given these findings, support from church members may play a key role in impacting the health of individuals of African descent (Debnam et al., 2012; Hamilton et al., 2010).

The mean scores for negative support from family and negative support from church members were significantly greater among African Americans and Caribbean Blacks compared

to non-Hispanic whites. To date, no studies have assessed the racial differences of positive and negative support from family and church members among African Americans, Caribbean Blacks, and non-Hispanic Whites with chronic illnesses. Therefore, it is recommended a qualitative analysis be conducted among individuals of African descent and non-Hispanic whites with chronic illnesses. A qualitative study will provide researchers with more insight into why individuals of African descent may perceive more negative support from family and church members compared to non-Hispanic whites. Findings from such a qualitative study will also be beneficial in understanding the role negative social support can play in certain aspects of the psychological well-being among individuals of African descent given previous studies have observed negative social support is associated with depressive symptoms among African Americans (Lincoln & Chae, 2012; Lincoln, Chatters, & Taylor, 2005).

In terms of the QOL domains, the mean scores for psychological well-being and spiritual well-being were significantly greater among both African Americans and Caribbean Blacks compared to non-Hispanic whites. Previous studies have also observed means scores for psychological well-being to be significantly lower among African Americans compared to non-Hispanic whites (Matthews et al., 2012; Reyes et al., 2017). However, these studies mainly focused on cancer survivors and are therefore not generalizable to individuals of African descent with a variety of chronic illnesses. Alternatively, the finding of a higher mean score for spiritual well-being among African Americans compared to non-Hispanic whites is consistent with a previous cross-sectional study (Peterman et al., 2002). Based on these findings, future researchers should consider assessing different QOL domains within a racially diverse study sample of individuals with chronic illnesses. Moreover, researchers should compare QOL domain means for each chronic illness versus combining chronic illnesses. Such comparisons

will allow researchers to determine if the mean values for each QOL domain are consistent across chronic illnesses. This in turn will allow researchers to decide if there is a specific domain that should be the primary focus of interventions designed to improve the QOL of individuals with chronic illnesses.

Of the three intrapersonal-level constructs examined, mean scores for stress were significantly greater among African Americans and Caribbean Blacks compared to non-Hispanic whites. African Americans and Caribbean Blacks also displayed significantly greater overall mean scores for the interpersonal-level variable everyday discrimination compared to non-Hispanic whites. The concept of the "weathering hypothesis" may provide an explanation for these findings (Geronimus, 1992; Geronimus, Hicken, Keene, & Bound, 2006). The "weathering hypothesis" suggests individuals of African descent are often exposed to more chronic life stressors (i.e., racism and discrimination) compared to non-Hispanic whites (Geronimus, 1992; Geronimus et al., 2006). Both the findings from this study as well as this hypothesis, can provide more insight into racial disparities in QOL among individuals of African descent compared to non-Hispanic whites. Further research is needed to examine how everyday discrimination and stress may impact the association between social support and QOL.

Study Aim 1: To examine common intrapersonal-level and interpersonal-level constructs as moderators and mediators.

Findings from study aim 1 revealed that specific intrapersonal-level and interpersonal-level constructs may potentially moderate or mediate the associations between factors of social support and the QOL among individuals with chronic illnesses. It has been suggested that a variable is capable of being both a confounder and moderator if it is a time-related factor (or varies as a person ages) (Pearce, Checkoway, & Shy, 1986). Previous studies have indicated that

the common intrapersonal-level and interpersonal-level moderating variables assessed within this study (stress and social ties) vary due to an individual's age (Laidmae, 2015; Reisig, Holtfreter, & Turanovic, 2018). This suggests that both stress and social ties can serve as confounders and moderators within the relationship between factors of social support and the QOL among individuals with chronic illnesses. Because this study was focused on the moderating effect of race on the association between factors of social support and QOL among individuals with chronic illnesses, neither stress nor social ties were assessed for moderation in this study. Additional research is needed to better understand how these variables may influence associations between factors of social support and QOL among individuals with chronic illnesses. More specifically, stratifying by different levels of stress and social ties, in future analyses will provide a more comprehensive understanding of the potential moderating effects of these variables.

It was also observed in this study that stress may mediate some associations between factors of social support and QOL among individuals with chronic illnesses. The potential mediating effects of stress have also been observed within a previous longitudinal study conducted among prostate cancer survivors (Zhou et al., 2010). Guided by the mediation guidelines proposed by Baron and Kenny (Baron & Kenny, 1986), the authors observed that stress partially mediated the relationship between perceived social support and the QOL among prostate cancer survivors (Zhou et al., 2010). By using longitudinal data to assess the potential mediating effect of stress within the relationship between social support and QOL, the authors were able to assess if the mediating effect is stable overtime (MacKinnon et al., 2007). Moreover, a longitudinal study can clarify the temporal relationship between the independent, dependent, and mediating variables (MacKinnon et al., 2007). Due to the study design of this

dissertation being cross-sectional, the temporal relationship between the independent, dependent, and mediating variables cannot be assessed. As a result, it is recommended that longitudinal studies be the primary study design when examining the mediating effects of stress within the relationship between factors of social support and QOL among individuals with chronic illnesses within future studies. By observing consistent findings within longitudinal studies, future researchers will acquire a better understanding of the potential mediating effects of stress within the relationship between factors of social support and the QOL among individuals with chronic illnesses (Johansson & Høglend, 2007).

The interpersonal-level variable, social ties, was also a consistent moderator and mediator within this study. These findings indicate different levels of social ties (i.e. low, medium, and high levels of closeness towards family, friend, or church member) may strengthen or weaken the association between factors of social support and QOL among individuals with chronic illnesses. Moreover, these findings also suggest social ties may potentially account for the association between social support and QOL. The mediating role of social ties on the relationship between factors of social support and QOL has not been examined within previous studies. However, it is suggested that social ties can moderate the relationship between negative life events and the QOL domain of psychological well-being (Kashima & Loh, 2006; Moritz, Kasl, & Berkman, 1995). Future studies that possess a similar study sample are needed to confirm the potential moderating effects of social ties on the relationship between factors of social support and the QOL among individuals with chronic illnesses. Findings from these future studies may allow for interventions to be implemented which focus on improving the QOL among individuals with certain social tie levels or helping individuals foster social ties.

Study Aim 2: To examine associations between sources of informal social support and QOL domains among individuals with chronic illnesses

Study aim 2 assessed the hypothesis that racial differences exist across informal sources of social support and their associations with QOL domains. This study also hypothesized the patterns of association between informal sources of social support and the QOL domains among individuals of African descent differed from non-Hispanic whites. The findings from the multiple imputation analyses confirmed the racial differences within these associations. More specifically, race moderated the associations between support from family and friends and the QOL domains among individuals with chronic illnesses. Support from both family and friends frequently displayed a negative association on certain QOL domains among individuals of African descent compared to non-Hispanic whites. Such findings contradict previous studies which observed that informal sources of support have a positive influence on the QOL among individuals with chronic illnesses (Cheng et al., 2014; Park, Nam, & Baek, 2000). A potential reason for the discrepancy in this finding may be due to the items used to measure the informal sources of social support within this study, primarily focusing on the frequency of perceived social support. As a result, these items did not assess if the perception of support from a source satisfied the participants of this study, which has been shown to predict the QOL of individuals as well (Carpenter, 2002; Chi & Chou, 2001).

The negative association between these variables may also be attributed to the items used to assess these variables not specifying if the frequency of perceived social support was positive or negative in nature. Previous cross-sectional studies have observed that individuals of African descent report perceiving both positive and negative social support from family and friends (Geller, Harmon, Burse, & Strayhorn, 2018; Johnson, Carson, Affuso, Hardy, & Baskin, 2014).

A comprehensive understanding of the association between perceived social support and the QOL among individuals with chronic illnesses may require future researchers to assess both positive and negative social support. By including these items, researchers can acquire a more comprehensive understanding of the relationship between these variables.

The patterns of associations did differ between informal sources of support and specific QOL domains among individuals of African descent and non-Hispanic whites after stratifying the study sample by race. However, many of these associations were non-significant, so the results of these analyses should be cautiously interpreted. These findings suggest associations between specific sources of support (specifically from family and friends) and QOL domains among African Americans and Caribbean Blacks are similar. As a result, informal social support interventions which educate both family members and friends on ways to reduce their provision of negative social support, may be an effective strategy for improving the QOL for both African Americans and Caribbean Blacks. Caribbean Blacks may specifically benefit from such interventions given previous findings that this racial group has a higher prevalence of anxiety and mood disorders compared to African Americans (Williams et al., 2007). In addition, major depressive disorder has been shown to be higher among Caribbean Blacks compared to African Americans (Williams et al., 2007).

Study Aim 3: To examine associations between informal sources of positive and negative social support and QOL domains among individuals with chronic illnesses.

Study aim 3 was designed to test the hypothesis that racial differences exist across informal sources of positive and negative social support and the associations of four QOL domains as well as overall QOL. Moreover, the multiple imputation analyses conducted in this study assessed the differences in the pattern of the associations between informal sources of

positive and negative social support and the four QOL domains among individuals African descent (i.e. African Americans and Caribbean Blacks) and non-Hispanic whites. Results from this study revealed that race did moderate the associations between informal sources of positive and negative social support and the QOL domains among individuals with chronic illnesses. For example, a negative association was observed between positive support from church members and the psychological and spiritual well-being of Caribbean Blacks compared to non-Hispanic whites. Such findings contradict existing studies which observed positive association between positive social support from an informal source and specific QOL domains (Debnam et al., 2012; Howley, 2015). However, these findings should be cautiously interpreted as both positive and negative support from church members contained the most missing values of all the factors of social support. The missing values within these variables can also result in an increase in committing both type I and type II errors (Rosenthal, 2017).

Negative support from church members was negatively associated with the spiritual well-being among African Americans compared to whites. A qualitative study has reported that individuals of African descent with chronic illnesses experience both positive and negative support from church members (Hamilton et al., 2010). However, the influence of both positive and negative social support from church members on the QOL among individuals of African descent has not been thoroughly researched. Additional research is encouraged to examine this association in more detail due to the church being a major source of support for individuals of African descent (Hamilton et al., 2010; Husaini & Reece, 2008).

Similar to study aim 2, differences in the patterns of association between both positive and negative social support and QOL among individuals of African descent compared to non-Hispanic whites were observed. A previous cross-sectional study observed that both African

Americans and Caribbean Blacks reported a higher frequency for positive support from family compared to negative support from family members (Taylor, Brown, Chatters, & Lincoln, 2012). However, while this study assessed positive and negative support from family it did not assess nuances of this support such as the frequency of positive and negative social support or positive and negative support from different family members (i.e., spouse, mother, father, siblings). Further research is needed to assess the patterns of association between positive and negative social support and the QOL among African Americans and Caribbean Blacks. These future studies may also allow researchers to design culturally tailored interventions that educate both family and church members on how the provision of both positive and negative social support can impact the QOL of individuals with chronic illnesses.

Limitations of this Study

One of the limitations of this study is its cross-sectional design. Given this design, the causality between factors of social support and QOL domains cannot be assessed. This study was only able to assess positive and negative social support from family and church members. Yet previous studies have observed that positive support from friends has been shown to have a positive influence on an individual's psychological well-being (Howley, 2015). As a result, an additional limitation of this study is that positive and negative support from friends was not assessed within this study. It is also recognized that both the complete case analyses and multiple imputation analyses did not control for disease-related characteristics (time of diagnosis, type of treatment/medication for treating illness, etc.), all of which also are believed to influence the relationship between factors of social support and QOL (Kroenke et al., 2013).

An additional limitation of this study is the operationalization of variables. There is a lack of internal validity for both the independent and dependent variables measured within this study.

This in turn can bias the study's results. PCFA resulted in one item measuring social well-being. It is recognized that measuring only one item for this domain may not adequately reflect the various aspects of social well-being (Keyes, 1998). Therefore, the inclusion of a variety of items is encouraged for measuring the social well-being among individuals within chronic illnesses in future studies. In addition to this, the items used to operationalize stress did not load onto one factor during PCFA. However, the 10 items were included due to a previous study having measured stress using these same items from the NSAL dataset (Johnson, 2010). However, this strategy is also a limitation as the weak internal consistency and poor factor structure caused excessive error in this measure which may be responsible for some of the null effects observed.

This study may have ignored potentially important moderating effects of social support/quality of life associations because of the inability to stratify analyses by stress and social ties. Moreover, this study did not assess the associations between factors of social support and the QOL within specific chronic diseases or categories of chronic diseases; it is therefore possible that associations between factors of social support and QOL may differ by type of chronic illness. However, due to several chronic illnesses within this study containing a small sample size, it would be difficult to make a firm conclusion on these potential associations.

It was also observed that the findings from the complete case analyses differed from that of the primary analyses (i.e., multiple imputation). This suggests that non-response bias (or the difference in responses from non-responders and responders) (Lambert & Harrington, 1990), may have influenced the coefficients in the multiple imputation analyses. Lastly, the multiple imputation analyses assume that the data within this study is MAR or ignorable. The decision to treat the data as MAR was based on the findings from the dummy variable adjustment. Moreover, previous studies have also utilized multiple imputation techniques to analyze

missingness within the NSAL dataset (Chatters et al., 2008; Chatters et al., 2011; Hudson, Neighbors, Geronimus, & Jackson, 2012). However, it is possible that this study's data can also be NMAR or non-ignorable. Unfortunately, NMAR is often difficult to determine as there is currently no software program designed to measure this missingness pattern (Scruggs & Mastropieri, 2006).

Strengths of this Study

This is the first study to date to assess the racial differences between informal factors of positive and negative social support and four QOL domains (physical well-being, psychological well-being, social well-being, and spiritual well-being) as well as overall QOL among individuals with chronic illnesses. As a result, the findings from this study provide evidence that the association between these factors of social support and QOL may differ among individuals of African descent compared to non-Hispanic whites. Given these differences, more interventions are needed that incorporate specific factors of social support specifically designed to enhance the QOL domains of individuals of African descent. An additional strength of this study is that findings were derived from a nationally representative population of both African American and Caribbean Blacks. This study also contains multiple measures of QOL which provide a more in-depth understanding of the association between specific factors of social support and the QOL among individuals with chronic illnesses. Lastly, this study provides evidence that the influence of social support on the health of individuals extends beyond specific types of social support. As a result, it is recommended that future researchers measure the construct of social support by incorporating aspects of both informal sources of social support as well as positive and negative social support.

Conclusion

The findings of this study can encourage future researchers to realize that social support may not always have a positive influence on an individual's health. It is therefore important to consider the source of support, as specific sources such as family and friends, can have a more negative impact on the QOL among individuals with chronic illnesses compared to other informal sources. Results from this study indicate that additional research is needed to understand the association between the nature of social support (or whether support is positive or negative) and the QOL among individuals with chronic illnesses. An understanding of the influence of both positive and negative social support on the QOL among individuals with chronic illnesses can be achieved by conducting both prospective longitudinal studies as well as qualitative studies. Moreover, a more clearer definition of negative social support is needed when assessing the association between this variable QOL. It is possible the inconsistent findings observed are due to there not being a clear definition for negative social support. With such a definition, future researchers can better equip informal sources of support with information on how to reduce their provision of negative social support to individuals with chronic illnesses.

The next step of this study is to qualitatively explore the how perceived positive and negative social support from different informal sources influence the QOL among individuals of African descent with chronic illnesses. Findings from this qualitative study will also provide more insight as to how specific factors of social support can play an influential role in reducing the racial disparities in the QOL among individuals with chronic illnesses. Moreover, a qualitative study can also provide information as to why study participants choose not to answer certain items related to social support and QOL. Through a post-hoc analysis, it was observed that frequency of religious service attendance was significantly associated with the missing items

for three social support variables: support from church members, positive support from church members, and negative support from church members (see Table 20). The reason as to why is currently unclear. However, a qualitative study may provide evidence as to why these participants chose not to answer these particular items.

Table 20: Cross-Tabulations of Missing Responses for Support from Church Members and Frequency of Church Services Attendance[a]

	Support from Church Members			Positive Support from Church Members			Negative Support from Church Members		
	Missing responses (n=571)	***Non-missing responses (n=2,714)***	***p-value***	***Missing responses (n=595)***	***Non-missing responses (n=2,690)***	***p-value***	***Missing responses (n=618)***	***Non-missing responses (n=2,667)***	***p-value***
Frequency of religious service attendance[b]									
Yes	366 (64.1%)	2,714 (100%)	<.0001	390 (65.6%)	2,690 (100%)	<.0001	413 (66.8%)	2,667 (100%)	<.0001
No	202 (35.4)	0 (0%)		202 (34%)	0 (0%)		202 (32.7%)	0 (0%)	

[a] Percentages are column percentages

[b] Item is derived from the National Survey of American Life Dataset (NSAL) which asks participants "Other than for weddings or funerals, have you attended services at a church or other place of worship since you were 18 years old?".

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IRB APPROVAL

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Principal Investigator: Shaila Strayhorn

Review Board: University of Memphis Full Board

Study History

1. **Submission Type:** Initial **Review Type:** Expedited **Decision:** Exempt