The Dissertation Committee for Janiece Lynn Walker Certifies that this is the approved version of the following dissertation:

Predictors of Disability in Middle-aged and Older African American Women with Osteoarthritis

Committee:

Tracie C. Harrison, Supervisor

Adama Brown

Carole Holahan

Cherie Simpson

Alexa Stuifbergen

Keith E. Whitfield

Predictors of Disability in Middle-Aged and Older African American Women with Osteoarthritis

by

Janiece Lynn Walker, B.S.N. ; M.S.N.

Dissertation

Presented to the Faculty of the Graduate School of
The University of Texas at Austin
in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

The University of Texas at Austin
December 2014

Dedication

To my grandmother, Opal “Honey” Smith

Acknowledgements

First and foremost, I would like to thank and honor God for making this possible.
He guided me and was the source of my strength.

I would like to express my sincere gratitude to those who have funded my research. This work could not have been done without the support of the National Hartford Center for Gerontological Nursing Excellence Patricia G. Archbold Scholarship and the MayDay Fund Scholarship. I would also like to acknowledge the support of the National Institute of Health and National Institute of Nursing Research-National Research Service Award (1F131NR014399-01).

I would like to acknowledge the support, guidance and patience of my dissertation chair, advisor and mentor, Dr. Tracie Harrison. She never gave up on me and helped me reach goals I never thought were attainable. She assisted me in finding my passion and my own path within gerontological and disability research. She was a role model and a guide throughout this journey. She exemplified true leadership and excellence in everything she did. I am blessed and eternally grateful for the opportunity to work with her.

My deepest appreciation goes to all of my committee members. Dr. Adama Brown was an excellent teacher and role model throughout the entire journey and gave expert advice on research methods appropriate for minority research. Dr. Carole Holahan showed a strong passion for research and taught me so much about gerontological research and theory. Dr. Simpson provided wonderful expertise and guidance in gerontologial research and gerontological nursing care and education. Dean Stuifbergen shared her knowledge and expertise in disability research, mentored me in leadership, and showed great patience with me from day one. Dr. Whitfield served as a co-mentor on my National Hartford Center for Gerontological Nursing Excellence Patricia G. Archbold Scholarship. He believed in me and supported me every step of the way. He provided endless encouragement, pushed me beyond my limits, and helped me expand my knowledge in minority and gerontological research.

I would like to thank my dear friends at UT for helping me accomplish this goal. Dr. Ana Todd was a wonderful writing partner and friend. Shalonda Horton has been my writing partner, accountability partner, a prayer warrior and a cherished friend. Dr. Tiffany Ricks (aka Nettie) was my coach, encourager, comic relief, and a treasured friend. I would also like to thank Charla Carrington in the Cain Center at the School of Nursing.

I am grateful and blessed to have family members and loved ones who stood by my side and pushed me through. My mother, Cheryl; father, Craig; and stepfather, Pierre, allowed me to stand on the shoulders of giants and sacrificed so that I could succeed. My brothers, Willie, Allen, Kevin, their families, and my baby brother Bryceson, supported me in every endeavor. Juliana supported and encouraged me along the journey, and is one of the best nurses I know. I am grateful for Karyn who is an outstanding librarian, prayer warrior, and friend who reminded me to keep swimming. William reminded me to walk like a giraffe and always uplifted and supported me. Yasha was my cheerleader and comic relief. I would also like to thank Henrietta Perkins and all the members of Grace Covenant Christian Center of Austin for their prayers and support. Finally, I would like to thank all of the women who participated in this study.

Predictors of Disability in Middle-Aged and Older African American Women with Osteoarthritis

Janiece Lynn Walker, Ph.D.

The University of Texas at Austin, 2014

Supervisor: Tracie C. Harrison

Given the percentage of African American women in the general U.S. population, the number of African American women with functional limitations and disabilities is disproportionate; although chronic conditions such as osteoarthritis may contribute to these disparities it is unclear what environmental factors may affect these outcomes in the women. Hence, the purpose of this study was to examine biological factors (age, body mass index, and waist circumference), psychosocial intra-individual factors (health care utilization, trust in health care providers, pain, pain beliefs, and depression), and cumulative extra-individual environmental factors (racial discrimination, stress from racial discrimination, and health care access) that may influence function and disability outcomes in African American women with osteoarthritis 50-80 years of age. The disablement process model combined with the cumulative inequality theory served as theoretical guides used for this study.

This study was a non-experimental, descriptive correlational study. The study included a sample of 120 African American women with OA from Texas and New Mexico. Surveys were mailed to participants or distributed in person. The statistical analysis consisted of correlations, linear regressions, multiple regressions and hierarchical regressions. The significant predictors of function were BMI, pain severity and pain beliefs. Pain severity and pain beliefs predicted disability. Depression mediated the relationship between racial discrimination and disability. It was demonstrated that biological risk factors, intra-individual and extra-individual factors are related to disablement outcomes in this sample of African American women. This study can inform the development of future interventions designed to decrease the risk of functional limitations and disabilities in middle-aged and older African American women with osteoarthritis.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Approximately 40% of African American women over the age of 60 report functional limitations, and 20% of the 27 million women living in the United States with disabilities are African American (Centers for Disease Control and Prevention [CDC], 2011b; Erickson, Lee & von Schrader, 2012; U.S. Census Bureau, 2008, 2010a). Given the percentage of African American women in the general U.S. population, the number of African American women with functional limitations and disabilities is disproportionate.

One major contributor to the high levels of functional limitations and subsequent disability in African American women is osteoarthritis (OA); approximately one million African American women over the age of 55 live with OA (CDC, 2009; Losina et al., 2011). African American women experience functional limitations and disability from OA at twice the rate of their non-Hispanic White counterparts (Song et al., 2007) but the cause of these high levels of disability in African American women is uncertain. It is therefore important to explore factors influencing trajectories to disability, specifically in African American women, and OA can serve as an exemplar for that exploration.

Disablement may be influenced by individual-level biological and psychological factors (Harrison, 2009a). The disablement pathway begins with pathology (disease or an abnormal physiological event), followed by impairment (alterations in the particular bodily systems), with function and disability as the result. *Functional limitation* is defined here as an alteration in the use of the body that restricts engaging in specific activities; *disability* is the inability to perform social roles due to an interaction between functional limitations and risk factors (e.g., biological), intra-individual factors (e.g., psychosocial), or extra-individual factors (e.g., environmental; Verbrugge & Jette, 1994). An accumulation of inequalities due to environmental factors can also influence the disablement process (Ferraro & Shippee, 2009; Harrison et al., 2013).

PURPOSE

The purpose of this study was to examine biological risk factors (age, body mass index [BMI], and waist circumference), intra-individual psychological factors (health care utilization, trust in health care providers, pain, pain beliefs, and depression), and cumulative extra-individual environmental factors (racial discrimination, stress from racial discrimination, and health care access) that may influence the disablement process in African American women 50–80 years of age with OA. Verbrugge and Jette's (1994) theoretical model of disablement, combined with a model of cumulative inequalities (Ferraro & Shippee, 2009), guide this study, following a within-group approach. The findings build on previous studies examining the disablement process in middle-aged and older women and are intended to inform the development of future interventions designed to decrease disability among middle-aged and older African American women with OA. Strategies to promote health and enhance quality of life designed for persons living with chronic disabling conditions are needed (Stuifbergen, Seraphine, Harrison, & Adachi, 2005).

BACKGROUND AND SIGNIFICANCE

Arthritis is the leading cause of disability in the United States, and OA is its most common form (CDC, 2011b). OA is a serious condition affecting many adults, with debilitating results. It is a chronic condition that occurs when a joint's underlying bone and cartilage break down (Arthritis Foundation, 2013; CDC, 2011b). OA can lead to pain and joint stiffness; the most commonly affected joints are the knees, hips, hands, and spine (CDC, 2011b). OA affects 33% (12.4 million) of all adults over the age of 65 (CDC, 2011b). Approximately 80% of adults with OA have some form of mobility impairment, and 25% cannot perform major activities of daily living (CDC, 2011b). OA is the cause of over 600,000 joint replacements each year and approximately 11 million outpatient visits (CDC, 2011b). In women with OA, insurer-related costs are reported to be approximately $4,833 higher than in women without OA (Kotlarz, Gunnarsson, Fang, & Rizzo, 2009). OA often leads to disability as well as high health care costs, and it certainly impacts the quality of life of aging adults.

Researchers have shown that women experience higher rates of OA than men, and women also have poorer outcomes and greater disability from OA. Women's disproportionately higher rates of OA increase still more after age 50 (CDC, 2011b). Researchers have reported that women have a thinner and reduced volume of knee cartilage in comparison with men, which may put them at higher risk for developing OA (Maleki-Fischbach & Jordan, 2010). Although the exact mechanism remains unclear, biological and behavioral changes unique to women who are postmenopausal predispose them to developing OA (Herrero-Beaumont, Roman-Blas, Castañeda, & Jimenez, 2009;

Neogi & Zhang, 2013). The average age of menopause is 51 years (National Institute on Aging, 2008). In addition, women with OA are more likely to experience disability than men with OA ($p < .001$; Murtagh & Hubert, 2004). Women with OA also have higher reports of pain ($F(1, 166) = 4.41$, $p < .05$), and more difficulty with physical function, ($F(1, 165) = 11.51$, $p < .001$) than do men with OA (Keefe et al., 2000).

OA is the most common form of arthritis (Arthritis Foundation, 2012), and in African Americans it can lead to mobility impairment and functional decline with age (CDC, 2010, 2011b). Pain and functional limitations have been shown to be greater in African Americans than in non-Hispanic Whites experiencing knee OA (Allen et al., 2010). In the Johnson County Osteoarthritis project, African Americans with OA over the age of 45 took longer to complete performance tasks such as timed chair stands and timed walks in comparison with non-Hispanic White counterparts ($p < .0001$; Elliot et al., 2007). In addition, Burns, Graney, Lummus, Nichols, and Martindale-Adams (2007) reported that in a sample of 518 African Americans and non-Hispanic Whites with OA, African Americans had significantly poorer walking performances ($p < .01$) in comparison with their non-Hispanic White counterparts even after controlling for BMI, education, income, and comorbidities. Due to these disparities, further work is needed in order to understand the disablement trajectory in middle-aged and older African American women.

Studying disablement and cumulative inequality in African American women 50–80 years of age with OA can increase our knowledge about the progression from functional limitations to disability in an understudied population. Among African American women, OA has debilitating effects and is highly prevalent. Cumulative inequality theory provides a unique approach to examine environmental factors that influence OA's progression within this population. In this study, the researcher therefore examined the variability of a sample of African women, a population group that is experiencing health disparities. The use of such a within-group approach can demonstrate how specific factors may adversely affect this group in particular (Whitfield, Allaire, Belue, & Edwards, 2008). It is hoped that the resulting new knowledge will contribute to the development of interventions to improve function and increase social role participation in middle-aged and older African American women with OA.

CONCEPTUAL FRAMEWORK

The Disablement Process

The disablement process model provides a specific theoretical framework that guided understanding of how biological risk factors, intra-individual psychosocial factors and cumulative extra individual factors influenced function and disability outcomes in African American women with OA. This conceptual model for understanding the preventable path from pathology to disability, first developed by Nagi (1991) and expanded by Verbrugge and Jette (1994), presents disablement as the effect of chronic or acute conditions on the body and on one's ability to fulfill expected social roles; process "reflects interest in the dynamics of disablement; that is, the trajectory of functional consequences over time and the factors that affect their direction, pace and patterns of change” (Verbrugge & Jette, 1994, p. 3). It is theorized in this model that the pathway to disability may start with pathology, but that this trajectory does not occur in a “social vacuum”; various risk factors, exacerbators, and interventions affect this process (p. 8). The disablement process model provides a strong theoretical framework for disability research, and it can lead to the application of research results in public policy and development of health care interventions (Verbrugge & Jette, 1994). In this study, the model guided understanding of the various factors that influence the disparities in functional limitations and disability rates for middle-aged and older African American women with OA (see Figure 1 for the theoretical model).

Cumulative Inequality Theory

Cumulative inequality theory allows one to understand how adversities throughout the life course may influence health and well being in later life (Kenneth F Ferraro & Shippee, 2009; Hatch, 2005; Turner & Lloyd, 1995). Cumulative inequality theory combines *cumulative disadvantage theory* and Elder’s *life course perspective* (Kenneth F Ferraro & Shippee, 2009). Cumulative disadvantage theory was introduced by Dannefer and Sell in 1988, who posited that the heterogeneity among older adults perhaps resulted from various outcomes that occurred throughout the life course. Robert Merton (1988), for example, similarly argued that only a small group of research scientists seemed to have adequate resources that allowed them to be the most successful in their respective fields; he posited that over their careers, an accumulation of resources, recognition, and productivity gave them an advantage over other research scientists.

Cumulative inequality theory specifies that social systems generate inequality, which manifests itself over the life course via demographic and developmental processes. In addition, "personal trajectories are shaped by the accumulation of risk, available resources, perceived trajectories and human agency" (Ferraro & Shippee, 2009, p. 334). Ferraro and Shippee describe the components of the theory as follows: (1) Social systems produce inequality, which is evidenced by demographic and developmental processes; (2) disadvantage increases the risk of exposure, whereas advantage increases opportunity; (3) life course trajectories are formed by this accumulation of risk, accessibility of resources, and human agency; (4) the perception of life trajectories impacts further trajectories; and (5) cumulative inequality can lead to early mortality. Further examination of cumulative adversity can increase our knowledge and insight into the process of aging, as well as our understanding of disablement.

In this study, cumulative inequality theory provides a framework for understanding how various environmental factors may accumulate throughout one's life span, affecting disability and function in later life. Different adversities throughout the life course such as discrimination may significantly influence outcomes for the elderly (Hatch, 2005) and may influence African American women with OA in later life. Racial discrimination can have cumulative effects on health, and a single discriminatory incident or a collection of such incidents can negatively influence immediate as well as future health outcomes (Blank, Dabady, & Citro, 2004; Hattery & Smith, 2007). Cumulative racial discrimination is "a dynamic concept that captures systematic processes occurring over time and across domains” (Blank et al., 2004, p. 225). An accumulation of various inequalities throughout one’s life course may have significant influences on function and disability in later life (Hatch, 2005).

Figure 1. Theoretical Model

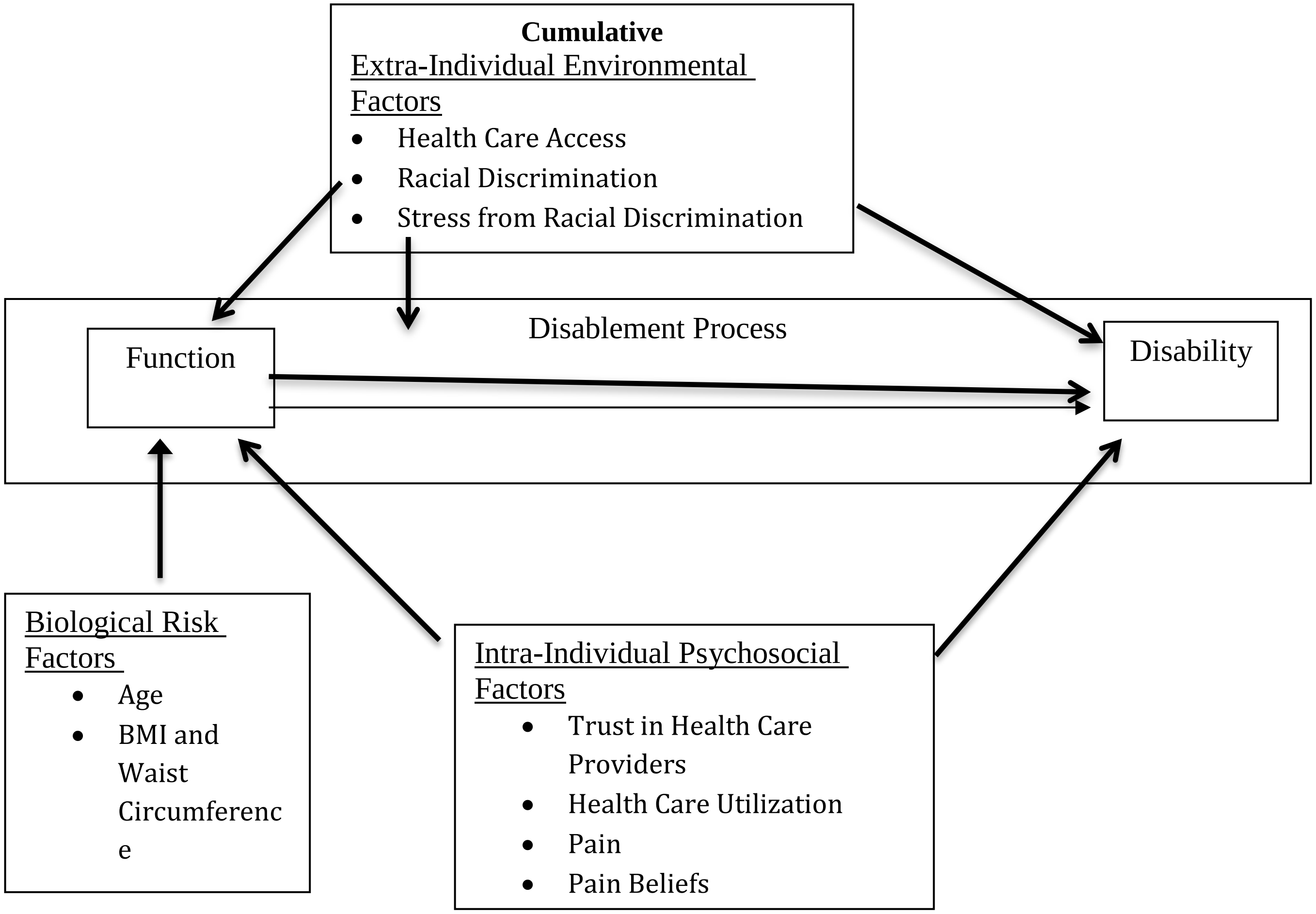
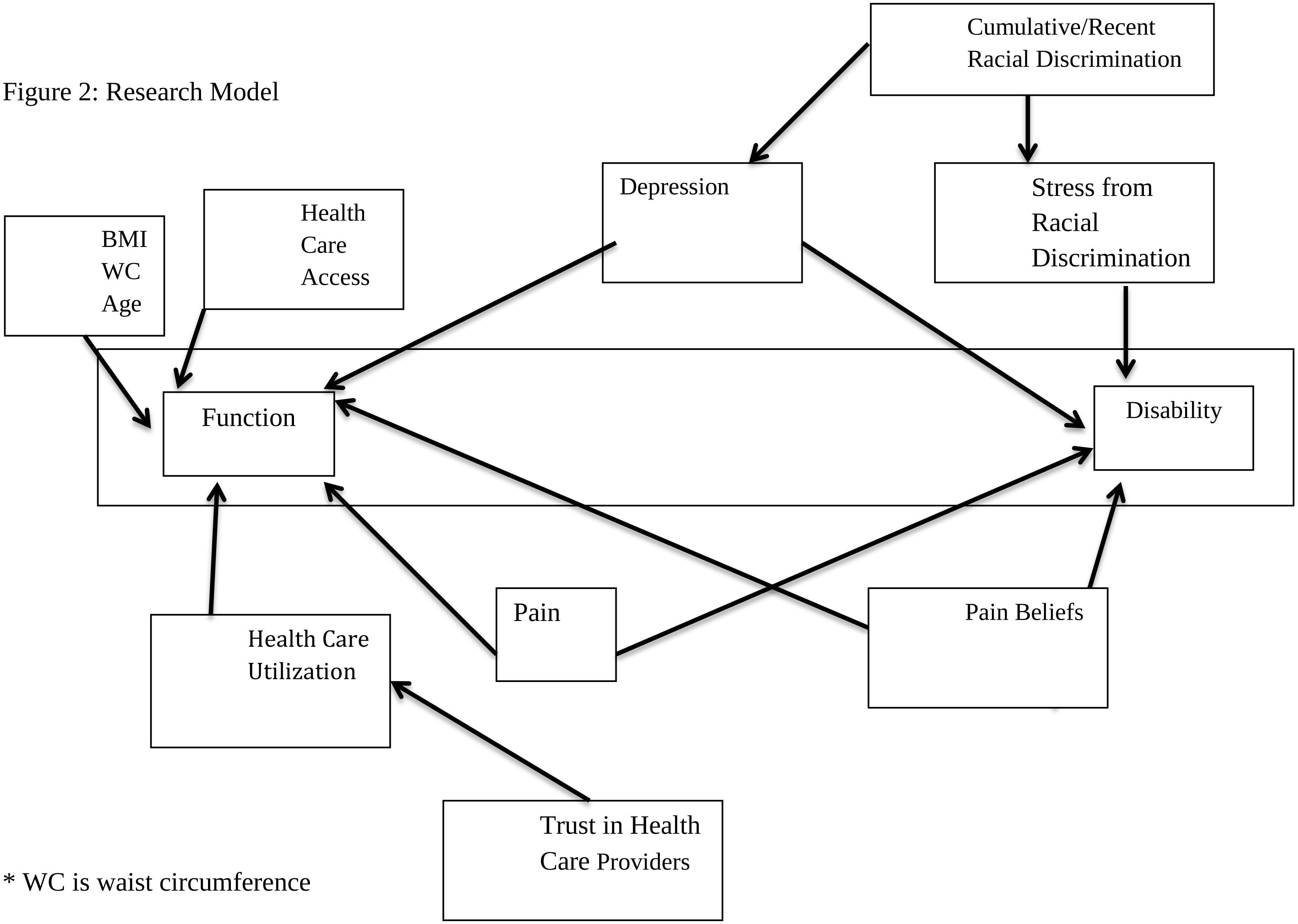


Figure 2: Research Model



* WC is waist circumference

The theoretical model in Figure 1 is based on both cumulative inequality theory and the disablement process model. The model shows the progression from function to disability in the disablement process; it hypothesizes that biological factors (BMI and age), intra-individual psychosocial factors (health care utilization, trust in health care providers, pain, pain beliefs, and depression), and cumulative extra-individual environmental factors (racial discrimination, stress from racial discrimination, and health care access) influence the disablement trajectory in middle-aged and older African American women with OA. In Figure 2, the research model is presented.

Main Pathway: Outcome Variables

African American women often experience high rates of functional limitations (CDC, 2011c) that can lead to disability and poor health outcomes (Verbrugge & Jette, 1994). Thorpe, Weiss, Xue, and Fried (2009), who examined racial differences in function in 436 women with disabilities, reported that African American women had more functional limitations than did non-Hispanic White women (78.5% vs. 66.9%). In a 3-year longitudinal study, Payette and colleagues (2011) reported that in a sample of adults 68–82 years of age, functional decline was significantly related to decline in cognition and to an increase in depressive symptoms. In a study with elderly African American female twins, Furner, Giloth, Arguelles, Miles, and Goldberg (2004) found that twins with functional limitations were three times more likely to have diabetes and four times more likely to have a myocardial infarction; 42% of twins with functional limitations rated their health poor, whereas only 13% of twins without functional limitations rated their health poor. Functional limitations can lead to poor health outcomes as well as subsequent disability. To slow this progression in middle-aged and older African American women, factors that predict functional limitations in this population must be explicated.

Disability is an outcome that can have a strong impact on the quality of life and health of aging populations (Harrison, 2009a). Women aging with disabilities are more prone to experience numerous health conditions, higher rates of chronic diseases, and higher mortality rates than are women aging without disabilities (Jones, 2009). Approximately 27 million U.S. women are living with disabilities, and over 50% of women over the age of 65 have disabilities (CDC, 2011b). African American women with disabilities comprise over 20% of all U.S. women with disabilities (U.S. Census Bureau, 2010a). Using a mixed ethnic sample of 5,316 women with disabilities, Leveille, Fried, McMullen, and Guralnik (2004) found that the African American women were more likely to be sedentary and have stroke and diabetes than non-White women. Disability compromises the health, quality of life, and length of life in African American women. It is essential to study the factors contributing to disablement in this population so that interventions can be developed to improve their functional capacity and increase their social involvement and independence (Verbrugge & Jette, 1994).

Biological Risk Factors

According to Verbrugge and Jette (1994), risk factors are behaviors or characteristics that may increase the chances of function or disability. Risk factors can be demographic, social, lifestyle, behavioral, or biological attributes that existed before the disablement process, and they can predispose an individual to functional limitations and disability. Risk factors can be long-term or permanent and often exacerbate the effects of chronic conditions.

The relevant risk factors for this study included age, BMI, and waist circumference. Researchers have documented that functional decline increases with age in people with arthritis and in African American populations (Dunlop, Manheim, Song, & Chang, 2005; Murrock & Zauszniewski, 2011). BMI and waist circumference are measurements that can be used to assess for obesity and fat distribution. It has been well documented that obesity is a risk factor associated with decreased mobility and movement as well as increased functional limitations in African American populations (Newton, Cromwell, & Rogers, 2009; Wee et al., 2011). Waist circumference is a measurement of abdominal fat distribution that cannot be measured by BMI (Klein et al., 2007; U.S. Department of Health and Human Services [USDHHS], 2000), and researchers have reported that waist circumference is related to poorer function in African American populations (Colbert et al., 2013; Houston, Stevens, & Cai, 2005). A waist circumference greater than 35 inches is considered high risk (USDHHS, 2000).

Intra-Individual Psychosocial Factors

According to Verbrugge and Jette (1994), intra-individual factors include any lifestyle or behavior changes, psychosocial attributes and coping, and/or any necessary accommodation activities that might influence the disablement trajectory. The intra-individual factors relevant for this study included health care utilization, trust in health care providers, pain, pain beliefs, and depression.

African Americans have lower rates of health care utilization than their non-Hispanic White counterparts (Dobalian & Rivers, 2008), and this has led to poorer health outcomes (Sharma, 2012) and limited treatment of chronic conditions among African Americans (Ibrahim, Siminoff, Burant, & Kwoh, 2002; Nicholson, Rooney, Vo, O'Laughlin, & Gordon, 2006). However, although lack of health care utilization affects health outcomes in African Americans, it is unknown whether health care utilization is related to functional outcomes in African Americans.

Among African Americans, distrust in health care providers is significantly related to less utilization of health care (Greiner et al., 2005; Musa, Schulz, Harris, Silverman, & Thomas, 2009; Nicholson et al., 2006; Owsley et al., 2006). If African Americans are not utilizing care such as rehabilitation services due to lack of trust in health care providers, this may lead to poorer functional outcomes. The present study examined whether health care utilization mediated the relationship between trust in health care providers and function in middle-aged and older African American women aging with OA. The goal was to provide further knowledge about intra-individual factors that may influence function outcomes in African American women.

African Americans have a history of distrust of the health care community (Hattery & Smith, 2007); this lack of trust is common among them, and it can influence their health care decisions and utilization of health care. Such trust can be defined as confidence or reliance in a health care provider or a health care provider's intent (Caterinicchio, 1979). Musa and colleagues (2009) reported that African Americans had significantly less trust in their physicians than did non-Hispanic Whites ($p < .001$), and this lack of trust was significantly related to lack of utilization of preventive care. Trust in health care providers may indirectly influence function outcomes in middle-aged and older African American women with OA; however, there are no studies on trust in health care providers and its relationship to function in later life among middle-aged older African American women.

It is well established that pain is prevalent among middle-aged and older African American women with OA and may significantly affect their function and disability. Pain is defined as the "subjective perception that results from the transduction, transmission, and modulation of sensory information. This input may be filtered through an individual's genetic composition, prior learning, history, current psychological status, and sociocultural influences" (Gatchel, Peng, Peters, Fuchs, & Turk, 2007, p. 582). For example, African American women with OA are more likely to have lower extremity pain or widespread musculoskeletal pain than their non-Hispanic White counterparts with OA (Allen et al., 2012; Leveille et al., 2004), and this pain has also been associated with functional decline and decreased ability to perform activities of daily living (Baker & Whitfield, 2006; Edwards, Moric, Husfeldt, Buvanendran, & Ivankovich, 2005; Parmelee, Harralson, McPherron, DeCoster, & Schumacher, 2012). Pain may significantly affect function and disability outcomes in middle-aged and African American women with OA.

Considerable evidence shows a relationship between pain beliefs and function outcomes in middle-aged and older adults, as well as pain beliefs and health outcomes in middle-aged and older African Americans. Pain beliefs represent a subset of a person’s belief system that presents his/her own personal understanding of the pain experience (D.A.Williams & Thorn, 1989). Beliefs about pain control, fear of hurting, and fear of harm may influence one’s adaptation to a chronic condition as well as one’s progression to disability (Main, Foster, & Buchbinder, 2010). Negative pain beliefs have been significantly associated with functional decline and disability in older adult populations (Geisser & Roth, 1998; Main et al., 2010). Positive pain beliefs have been significantly associated with better health status among African American women with rheumatoid arthritis (M. S. Jordan, Lumley, & Leisen, 1998). Pain beliefs may be related to disablement outcomes in middle-aged and older African American women with OA.

Depression is common among middle-aged and older adults with OA (Husaini & Moore, 1990), and considerable evidence supports a relationship between depression and function in African Americans (Bruce, 2008; Dickens & Creed, 2001; Graney, 2000). In this study, *depression* is defined as an illness or disorder of the brain that can be caused by genetic, biological, or genetic factors; it is characterized by a combination of symptoms that influence functional outcomes (National Institute of Mental Health [NIMH], 2013). Hence, depression is theorized here not as a sad feeling or a change in mood in response to a situation, but as a biological illness caused by genetic, environmental and psychological factors that can influence functional outcomes as well as a person's ability to participate in specific activities such as going to work (NIMH, 2013). Gitlin, Hauck, Dennis, and Schulz (2007) have reported a significant positive correlation between functional limitations and depression in 129 older African Americans. In addition, Baker and Whitfield (2006) reported that depressive symptoms were a significant predictor of function among older African Americans. Mendes de Leon and Rajan (2014) reported that depressive symptoms were significantly related to disability within a sample of older African Americans and non-Hispanic Whites. The present study examined whether depression is significantly related to function in middle-aged and older African American women with OA. In addition, it was examined if depression mediated the relationship between racial discrimination and disability.

Cumulative Extra-Individual Environmental Factors

Extra-individual factors can include an individual's physical and social environment and may influence an individual's degree of functional limitations and disability (Verbrugge & Jette, 1994). The extra-individual factors relevant to this study included racial discrimination, stress from racial discrimination, and health care access. These factors are considered part of a person's social environment and were therefore theorized as extra-individual.

Racial discrimination that occurs throughout the lifetime of African Americans can have cumulative effects on their health, and a single discriminatory incident or a collection of such incidents can negatively influence immediate as well as future health outcomes (Blank et al., 2004; Hattery & Smith, 2007). Racial discrimination comprises "overt acts such as direct verbal slurs, innuendos, or physical action, or less obvious covert acts such as being perceived as less capable, worthy or deserving of success, opportunities, or rewards" that are based on a person's race (Barksdale, Farrug, & Harkness, 2009, p. 104). Researchers have reported significant relationships between racial discrimination and poor health outcomes in African Americans (Burgess et al., 2009; Lee, Ayers, & Kronenfeld, 2009). In addition, racial discrimination can accumulate throughout the life course of African Americans, which may have health implications in later life (Gee, Walsemann, & Brondolo, 2012). Continuous exposure to racial discrimination throughout the life course in African Americans has been significantly related to an increase risk of violent behaviors (Estrada-Martinez, Caldwell, Bauermeister, & Zimmerman, 2012), more depressive symptoms (Mcllvane, Baker, & Mingo, 2008) and poorer perceived health (Kwate, Valdimarsdottir, Guevarra, & Bovbjerg, 2003). Due to the literature supporting the relationships between racial discrimination and depression it was hypothesized here that depression mediated the relationship between racial discrimination and disability in middle-aged and older African American women with OA.

Although relationships between racial discrimination and health outcomes in African Americans have often been examined, it is the perceived stress of racial discrimination that also may link racial discrimination and health outcomes in African

Americans (Landrine & Klonoff, 1996; Pascoe & Smart Richman, 2009). In this study, stress will be defined as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well being” (Lazarus & Folkman, 1984, p. 19). Stress from racial discrimination has been significantly related to various health outcomes in African Americans (Landrine & Klonoff, 1996), such as increased difficulty with sleep (Hicken, Lee, Ailshire, Burgard, & Williams, 2013) and an increase in complications from diabetes (M.E. Peek et al, 2011).

In this study it was examined whether stress from racial discrimination mediated the relationship between racial discrimination and disability in African American women with OA. When perceived stress from a specific event is measured objectively, one can estimate a relationship between specific events that perceived as stressful and specific health outcomes (Cohen, Kamarck, & Mermelstein, 1983). The knowledge thus gained can guide interventions and future studies. Interventions can be tailored to address this stressor in African American women with OA in order to improve their quality of life and increase their social role participation.

Limited health care access among middle-aged and older African American women with OA has been associated with poor pain management, less preventive care, and higher mortality rates (Henry J. Kaiser Family Foundation, 2004). Although African American women 65 years of age and older may have access to Medicaid, they may still have difficulty accessing health care because of lack of appointment availability, geographical access (Aroian, Vander, Peters, & Tate, 2007), physical accessibility, acceptance of services (Gulliford et al., 2002), or accessing providers for questions about their condition or prescriptions. It is well documented that health care access is significantly related to health outcomes. Here it was hypothesized that health care access predicted function, as well as moderated the relationship between function and disability, in middle-aged and older African American women with OA.

SUMMARY

The immediate goal of this study was to investigate factors that were related to disablement outcomes in African American women with OA 50–80 years of age, using the disablement process model and cumulative inequality theory. The disablement process model guided the understanding of how various factors may have affected disablement outcomes in middle-aged and older African American women with OA. Cumulative inequality theory served as a theoretical guide in understanding how cumulative inequalities over the life course may influence disablement outcomes in middle-aged and older African American women with OA.

The hypothesized relationships presented in Figure 2 were tested in this study. The biological risk factors in the model are age, BMI, and waist circumference. The psychosocial intra-individual factors are health care utilization, trust in health care providers, pain, pain beliefs, and depression. The cumulative extra-individual environmental factors are racial discrimination, stress from racial discrimination, and health care access. The paths hypothesized in the conceptual model were based on specific risk factors identified in previous literature as predictors of function, as well as intra-individual psychosocial factors and cumulative extra-individual environmental factors identified as predictors of health outcomes that may translate to predictions of disablement outcomes. The results of this study provide data that will inform the development of interventions to decrease functional limitations and disabilities in middle-aged and older African American women with OA. In addition, this study may be a starting point for a project to improve the health, function, and quality of life of minorities aging with chronic and disabling conditions.

RESEARCH QUESTIONS

The research questions addressed in this study focused specifically on African American women with OA, 50–80 years of age.

Question 1. What are the relationships between age, BMI, waist circumference, pain, pain beliefs, health care access, trust in health care providers, health care utilization, cumulative racial discrimination, depression, and function?

Question 2. What are the relationships between age, racial discrimination, cumulative racial discrimination, stress from discrimination, pain, pain beliefs, depression, function, and disability?

Question 3. Which are the significant predictors of function among age, BMI, waist circumference, pain, and depression?

Question 4. Which are the significant predictors of disability among pain, pain beliefs, depression, and stress from racial discrimination?

Question 5: Which are the significant predictors of function among pain, pain beliefs, and depression when controlling for biological risk factors (age, BMI, and waist circumference)?

Question 6. Does health care access moderate the relationship between function and disability?

Question 7: Does health care utilization mediate the relationship between trust in health care providers and function?

Question 8: Does stress from racial discrimination mediate the relationship between racial discrimination and disability?

Question 9: Does depression mediate the relationship between racial discrimination and disability?

DEFINITION OF TERMS

For the purposes of this study, the following definitions were used.

Main Pathway: Outcome Variables

Functional Limitations

Theoretical definition: Functional limitation is an alteration in the use of the body that restricts engaging in specific activities (Verbrugge & Jette, 1994). Functional limitations indicate difficulty in engaging in specific tasks such as writing, talking, walking, or climbing stairs (Harrison, 2009b).

Disability

Theoretical definition: Disability is the inability to perform social roles due to the interaction between a functional limitation and individual (e.g., biological and psychosocial) as well as extra-individual (e.g., environmental) factors (Verbrugge &

Jette, 1994). Disability occurs when a person perceives that he or she can no longer fulfill specific roles such as being a voter, mother, or employee (Harrison, 2009a).

Risk Factors

Age

Theoretical definition: Age is the length of time a person has existed.

Body Mass Index

Theoretical definition: Body mass index (BMI) is a measure of body fat in adults based on height and weight (USDHHS, 2000). Women will be classified as overweight if they have a BMI of 25–29.9kg/m^2 or obese if they have a BMI over 30 kg/m^2 (USDHHS, 2000).

Waist Circumference

Theoretical definition: Waist circumference is a measurement of abdominal fat distribution (USDHHS, 2000).

Intra-Individual Psychosocial Factors

Health Care Utilization

Theoretical definition: Health care utilization can be defined as how much and what type of health care a person uses (Bernstein et al., 2003).

Trust in Health Care Providers

Theoretical definition: Trust can be defined as confidence in or reliance on a health care provider or a provider's intent (Caterinicchio, 1979).

Pain

Theoretical definition: Pain is the "subjective perception that results from the transduction, transmission, and modulation of sensory information. This input may be filtered through an individual's genetic composition, prior learning, history, current psychological status, and sociocultural influences" (Gatchel et al., p. 582).

Pain Beliefs

Theoretical definition: Pain beliefs are defined as a subset of a person's belief system that represents his/her own personal understanding of the pain experience (D.A.Williams & Thorn, 1989).

Depression

Theoretical definition: Depression is an illness or disorder of the brain that may be caused from genetic, biological, or genetic factors and is characterized by a combination of symptoms that can influence functional outcomes or engagement in social roles (NIMH, 2013).

Cumulative Inequalities: Extra-Individual Environmental Factors

Racial Discrimination

Theoretical definition: Racial discrimination consists of "overt acts such as direct verbal slurs, innuendos, or physical action, or less obvious covert acts such as being perceived as less capable, worthy or deserving of success, opportunities, or rewards" on the basis of a person's race (Barksdale et al., 2009, p. 104). Cumulative racial discrimination is "a dynamic concept that captures systematic processes [racial discrimination] occurring over time and across domains" (Blank et al., 2004, p. 225).

Perceived Stress from Racial Discrimination

Theoretical definition: Perceived stress is "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well being" (Lazarus & Folkman, 1984, p. 19).

Health Care Access

Theoretical definition: Health care access is defined as "the ease with which an individual can obtain needed medical services" (RAND, 2010).

ASSUMPTIONS

The following assumptions were made for this study:

1. Health care providers used their most current knowledge to diagnose OA to the best of their ability.

2. The participants answered questions about screening criteria to the best of their ability from their current knowledge.

3. The participants answered survey questions to the best of their ability from their current knowledge.

4. Biological processes as well as intra-individual and extra-individual factors affect the disablement process.

LIMITATIONS

This study had the following limitations:

1. Generalizations of the results were limited to women with OA of similar ages, ethnicity, and demographic locations.

2. The self-report of weight and height may not have been exact, and waist circumference may not have been measured correctly.

3. The design of this study was cross-sectional; therefore causality could not be assumed.

Chapter 2: Review of the Literature

African American women aging with chronic conditions experience high rates of functional limitations and disability (CDC, 2011c; U.S. Census Bureau, 2008, 2010a; Erickson et al., 2012), which can influence quality of life and independent living (Kaplan, 1992). Although researchers have suggested that these disproportionate rates of functional limitations in African American women aging with chronic conditions may be due to factors such as BMI, waist circumference, and pain (Baker & Whitfield, 2006; Colbert, 2013), the findings are mixed, and it remains unclear what factors significantly affect the trajectory from pathology to disability in African American women aging with chronic conditions. Further work is needed to gain an understanding of why African American women aging with chronic conditions have such disproportionate rates of functional limitations and disability (Bolen et al., 2010; Annmarie Cano, Mayo, & Ventimiglia, 2006). By gaining a better understanding of what factors lead to high rates of functional limitations and disabilities, researchers can begin to develop interventions to improve function and decrease disabilities that are tailored to African American women aging with chronic conditions.

The purpose of this study was to examine biological risk factors, intra-individual psychological factors, and cumulative extra-individual environmental factors that may influence the disablement process in African American women 50–80 years of age with OA. The researcher theorized a multifactorial cause for these disablement outcomes in the women, using the disablement process model (Verbrugge & Jette, 1994) and cumulative inequality theory (Ferraro & Shippee, 2009). Researchers have studied factors that influence the disablement process among Mexican American women (Harrison, 2009a; M. K., Ottenbacher, Markides, & Ostir, 2003) and non-Hispanic White women (Harrison & Stuifbergen, 2001; Stuifbergen, Brown, & Phillips, 2009). However, there is a dearth of literature examining factors that influence the disablement process in middle-aged and older African American women.

It was essential to conduct this study using the disablement process model and cumulative inequality theory because "health disparities have been documented in disability-related outcomes in women, but theoretical explanations for the differences in outcomes are missing" (Harrison, 2009a, p. 6). This study is significant because many of the previous studies have been atheoeretical; there was no solid theory to guide an understanding of factors related to the high rates of functional limitations and disabilities in African American women aging with OA. The disablement process model was appropriate for this study because it can serve as a guide in understanding the multifactorial causes that influence function and disability outcomes in people aging with chronic conditions. Cumulative inequality theory was an appropriate theory to use because it can serve as a theoretical guide for understanding the unique life course events that may significantly influence function and disability outcomes in middle-aged and older African American women. This is not a comparative study, but rather a within-group study, intended to provide insight into how these factors specifically influence

African American women aging with OA. When within-group variability is known about a minority group, policies and interventions can be better tailored to meet the needs of that particular group (Whitfield & Baker-Thomas, 1999).

From the evidence put forth in this chapter, the following assertions can be made:

1. It is unclear what factors contribute to such high rates of functional limitations and disabilities in African American women with OA (Bolen et al., 2010).

2. Cumulative inequality theory is a sound theoretical perspective from which to study environmental factors that affect the disablement process specific to African American women with OA (Hatch, 2005; Jackson & Sellers, 2001).

3. There is evidence that BMI (Colbert et al., 2013), pain (Baker & Whitfield, 2006), and depression (Bruce, 2008) may influence function and disability outcomes in middle-aged and older African American women. There is evidence showing that pain beliefs, trust in health care providers, racial discrimination, and stress from racial discrimination may influence health outcomes in African American women; yet it remains unclear whether these factors may influence the disablement trajectory.

4. The impact of knowing how environmental factors affect the disablement process in middle-aged and older African American women with OA may lead to economical interventions.

This chapter begins with a discussion of the pathology and potentially disabling effects of OA in middle-aged and older adults, including a review of the prevalence and disabling effects of OA in African Americans. Second, a summary of the study’s theoretical perspectives will be provided. Finally, a literature review of the following factors will be presented: (1) functional outcomes, (2) disability outcomes, (3) age, (4) BMI and waist circumference, (5) health care utilization, (6) trust in health care providers, (7) pain and pain beliefs, (8) depression, (9) racial discrimination and stress from racial discrimination, and (10) health care access in African Americans. Due to limited research focused specifically on middle-aged and older African American women, the literature included in this review will cover samples consisting of both middle-aged and/or older African American men and women. Tables for this literature review are included at the end of the chapter.

Pathology of OA

OA is a debilitating chronic form of arthritis that affects various joints in the body. OA results directly from breakdown of the joints’ protective cartilage (Arthritis Foundation, 2013; Mayo Clinic, 2013). The connective tissue cells (chondrocytes) are then no longer able to preserve articular cartilage or maintain homeostasis within the joints (Van der Kraan, 2012). In the beginning stages of OA, swelling of the cartilage occurs (Martel-Pelletier & Pelletier, 2010). In the later stages of OA, joint space cartilage is lost and bone spurs (osteophytes) can occur (Lozada & Diamond, 2013). OA worsens with time and can affect any joint in the body, but it most commonly affects the knee, hand, spine, or hip joints (Mayo Clinic, 2013).

The effects of OA may vary with the joint site. When OA of the knee occurs, the individual’s articular cartilage, synovial membrane, and menisci are affected; synovitis is secondary to inflammation and changes in the cartilage surrounding the knee (Martel-Pelletier & Pelletier, 2010). When OA of the hand occurs, cartilage degradation usually occurs in the distal and proximal interphalangeal joints of the hand, and an inflammatory response is often absent or not pronounced (Lozada & Diamond, 2013). When OA of the spine occurs, cartilage changes are usually seen between lumbar 3 and 5, and foraminal narrowing occurs from arthritic changes (Lozada & Diamond, 2013). OA can lead to pain, stiffness, limited movement, and sometimes inflammation or redness at the affected joint site (Arthritis Foundation, 2013).

Function and Disability Outcomes of OA in Aging Adults

OA is a chronic condition that leads to functional impairment and disability in older adults (Brooks, 2002; Hochberg, Kasper, Williamson, Skinner, & Fried, 1995). Approximately 80% of adults with OA have some form of mobility impairment, and 25% cannot perform major activities of daily living (CDC, 2011b). Pain, stiffness, and inflammation can affect physical function, which can lead to disability in older adults (Brooks, 2002; Verbrugge & Jette, 1994).

OA in African American Women

Approximately 4.6 million African Americans report having physician-diagnosed arthritis (Bolen et al., 2010); in some cases, African Americans experience OA less than other groups, depending on the type of OA. For example, Nelson and colleagues (2011) conducted a study to contrast the prevalence of different types of OA between African Americans and non-Hispanic Whites: African American women had twice the odds of not having OA in any joint in comparison with non-Hispanic White women (OR 1.93[1.30–2.88]); however, African Americans with OA had more than twice the odds of having tibiofemoral OA than non-Hispanic Whites with OA. In addition, researchers have reported that older African American women had higher rates of knee OA than older non-Hispanic White women (J. M. Jordan et al., 2007; M. Sowers et al., 2006).

Function and Disability Outcomes in African Americans with OA

African American women experience functional limitations and disability from OA at twice the rate of their non-Hispanic White counterparts (Song et al., 2007), but the cause of these disparities in African American women remains unclear. African Americans with OA have poorer functional outcomes and more disability than non-Hispanic Whites with OA (Allen et al., 2010; Allen et al., 2009; Bolen et al., 2010; Sims et al., 2009) and more activity limitations (Burns, Graney, Lummus, Nichols, & Martindale-Adams, 2007) than do non-Hispanic Whites with OA. In addition, researchers have reported that African American women with OA had poorer functional outcomes and more disability than non-Hispanic Whites with OA (Andresen & Brownson, 2000; Colbert et al., 2013; MaryFran Sowers et al., 2006).

Contributing Factors to Function and Disability Outcomes

Researchers have attributed poorer functional outcomes and high disability rates in African Americans with OA to various factors. However, why African Americans with OA have more functional limitations and disability than other racial ethnic groups remains unclear and needs further investigation (Bolen et al., 2010). As can be seen in

Tables 1 and Table 2, research supports that these disproportionate rates of disability and functional outcomes are not solely related to OA severity, but to other factors. For example, Allen and colleagues (2009) have suggested that BMI and depressive symptoms are significantly related to poorer function in African Americans with OA. According to Colbert and colleagues (2013), increased BMI was significantly related to poorer function outcomes in African Americans with OA. Andresen and Brownson (2000) posited that comorbid conditions as well as socioeconomic disadvantages may have been related to poorer function and more disabilities in African Americans with OA. Other researchers have reported that even after controlling for BMI and socioeconomic factors, there are still significantly more functional limitations and disability in African Americans with OA in comparison with other racial/ethnic groups with OA (Burns et al., 2007; Colbert et al., 2013).

THEORETICAL PERSPECTIVE

The Disablement Process Model

The disablement process model has been used to guide research studies both between racial groups and within non-Hispanic White and Hispanic samples. For example, Song and colleagues (2007), examined racial differences in disability onset in older adults, and reported that co-morbid conditions and health behaviors were significantly associated with disability risk in African Americans and Mexican Americans ($p < .05$). Thorpe and colleagues (2008) likewise used the disablement process model to guide their examination of longitudinal relationships between race, poverty, and function in older non-Hispanic White and African American women with disabilities; after 3 years of examining these women, African American women categorized as non-poor had slower walking speeds (0.52 vs. 0.65 miles per second; $p < .05$) and poorer lower extremity function (4.39 vs. 3.64 points; $p < .05$) than non-Hispanic White women who were categorized as non-poor. Mendes de Leon and Rajan (2014), who examined the role of psychosocial characteristics on the disablement trajectory in older African American and White using the model, reported that African Americans had a higher risk of disability onset in comparison to non-Hispanic Whites (coefficient=. 653, $p<.01$). Stuifbergen and colleagues (2009) used the model to explore how behavioral and biological factors influenced the disablement trajectory in a mostly non-Hispanic White population with multiple sclerosis; significant predictors of disability included health promoting behaviors ($\beta = -.136$, $t = -2.354$, $p = .019$) and social support ($\beta = .013$, $t = 2.914$, $p = .004$). M.K. Peek, Patel, and Ottenbacher (2005), who examined disability outcomes in Mexican Americans using the model, reported that impairment was significantly associated with functional limitations ($\beta = .36$, $z = 7.2$) and functional limitations were significantly related to disability ($\beta = -.53$, $z = 16.1$).

Few researchers have used the disablement process model as guide for understanding disablement outcomes within samples of African Americans. For the present investigation, only one such study was found: Ricks and Harrison (2013) used the disablement process model to understand disablement and health promotion within a sample of young adult African American men and women with mobility impairments.

They found that the participants had a desire for intimacy, independence, and autonomy within the context of their losses related to their impairments.

This study of disablement in African American women 50–80 years of age with OA can increase our knowledge about the progression from functional limitations to disability in an understudied population. The disablement process model provides a tool for understanding various biological, psychosocial, and environmental factors and how they influence the disablement trajectory (Verbrugge & Jette, 1994). This study can therefore illustrate how risk factors, psychosocial intra-individual factors, and cumulative extra-individual factors influence functional limitations and disability in middle-aged and older African American women with OA. The knowledge gained from this study will help shape interventions tailored for African American women aging with OA.

Cumulative Inequality Theory

Researchers have examined relationships between various cumulative/life course factors with health outcomes in African Americans; however, much of this research has not been theory driven. For example, when James, Fowler-Brown, Raghunathan, and Van Hoewyk (2006) examined the relationship between obesity outcomes and socioeconomic position in 679 African American women, they did not report using a specific theory for their study; however, they did report that the odds of obesity in adulthood were twice as likely in the women with low socioeconomic positions in childhood, and women with low socioeconomic positions in adulthood had 25% more obesity than women who were of high socioeconomic positions in adulthood. When Pollitt and colleagues (2007) examined relationships between cumulative life course and adult socioeconomic status with inflammatory markers in adulthood among 12,681 non-Hispanic Whites and African Americans, they too did not report use of a specific theory; however, they did report that increased cumulative exposure to low SES was inconsistently related to elevated inflammatory levels in African Americans.

Some research with African Americans has been guided by cumulative inequality theory. For example, Ferraro, Thorpe, McCabe, Kelley-Moore, and Jiang (2006) used cumulative inequality theory to examine hospital admissions and discharge rates between African American and non-Hispanic White adults. Both groups were hospitalized at fairly similar rates in early adulthood, but African Americans were less likely to be hospitalized in later life than non-Hispanic Whites. In a second study, Kail and Taylor (in press) used cumulative inequality theory to examine whether private insurance coverage or market place insurance coverage were mediators to onset, persistent level, or acceleration of functional limitations in Medicare-eligible Americans. They reported that African Americans were more likely to experience onset and acceleration of functional limitations than their non-Hispanic White and Hispanic counterparts ($p < .05$), and mobilizing financial resources into insurance coverage reduced the risk of developing functional limitations. In a third study, Szanton, Thorpe, and Whitfield (2010) examined cumulative factors and life course factors within a sample of African Americans. This was a within-group study of life-course financial strain and different health outcomes in African Americans; in middle-aged and older African Americans, financial strain throughout the life course was significantly associated with depression and disability.

Research with middle-aged and older African Americans must take into account their lifetime exposure to environmental events and social positions that may have influenced outcomes in middle and older adulthood (Jackson & Sellers, 2001). African American women may experience unique life course events that can influence their function and disability outcomes in later life. For example, racial discrimination is common throughout the lives of African American women, and it can have a cumulative effect on their overall health outcomes and health behaviors in later life (Blank et al., 2004; Casagrande, Gary, LaVeist, Gaskin, & Cooper, 2006; Hattery & Smith, 2007). In the present study, cumulative inequality theory provides a sound framework for understanding how cumulative inequalities experienced by African American women throughout their lifetimes may lead to poorer function and more disability in later life. Initial work has been done with this theory in order to understand health outcomes and decline in middle-aged and older African Americans (Ferraro, Thorpe, McCabe, Kelley-Moore, & Jiang, 2006; Szanton et al., 2010); the next step is to explore these factors in a within-group study of middle-aged and older African American women.

The present study is therefore an examination of societal and environmental experiences throughout the life course of African American women that may influence function and disability outcomes in middle and late adulthood. If we can understand how these early life circumstances influence function and disability outcomes in African American women with OA, we may be able to conduct interventions earlier in the life course to improve function and increase social role participation in African American women with OA.

MAIN PATHWAY

Function Outcomes

There is a considerable literature on functional outcomes among African Americans with arthritis, but only a few studies focus on OA. Literature on functional limitations in African Americans with OA is presented in Table 1. Eleven studies were found in which researchers examined function outcomes in African Americans. All the studies except one (Wolinsky et al., 2014) were comparative, and none looked at functional outcomes specifically in African American women with OA. In nine of the studies, researchers reported that African American men and women with OA had poorer functional outcomes than their non-Hispanic White counterparts (Allen, 2010; Allen et al., 2009; Allen et al., 2010; Bolen et al., 2010; Burns et al., 2007; Colbert et al., 2013; Elliott et al., 2007; J.M. Jordan, Linder, Renner, & Fryer, 1995; Sowers et al., 2006). In two studies, researchers reported that African American women with OA had poorer functional outcomes than non-Hispanic White women with OA (Colbert et al., 2013; Sowers et al., 2006). Researchers reported mixed results regarding which factors were related to functional outcomes in African Americans. For instance, BMI and depression have provided both explanatory and non-explanatory results for function outcomes in middle-aged and older African American women. Allen and colleagues (2010) reported that after controlling for BMI and depression, there were no longer any significant differences in function between African Americans with knee OA and non-Hispanic Whites with knee OA. Bolen and colleagues (2010) reported that even after controlling for age and BMI, African Americans were still more likely to have activity and functional limitations than were non-Hispanic Whites. Wolinsky and colleagues (2014) reported that African Americans with arthritis were more likely be in groups where participants had good function with slow or modest decline or gradual decline than were participants without arthritis ($p < .001$), and depressive symptoms increased the likelihood of having stable poor function ($p < .01$). All in all, researchers demonstrated that African Americans with OA had poorer function outcomes than did non-Hispanic Whites with OA. Researchers have reported significant relationships between function and age (Dunlop et al., 2005), BMI (Newton et al., 2009), depression (Bruce, 2008), pain (Baker & Whitfield, 2006), and pain beliefs (Main et al., 2010). These factors will be discussed later in this chapter.

Disability Outcomes

Researchers have reported that disability is higher among African Americans with OA and other types of arthritis than among non-Hispanic Whites; however, definitions of disability vary greatly, and it remains unclear why this disparity exists. The results of disability outcomes in African Americans with arthritis are presented In Table 2. Four studies were found. In one, African Americans with OA had more disability than did non-Hispanic Whites with OA, even though there were no radiographic differences in disease severity between the two groups (Sims et al., 2009). Overall, African Americans with arthritis had more disability than did non-Hispanic Whites with arthritis (Andresen & Brownson, 2000; Song et al., 2007). African Americans with hip/knee OA or ischemic heart disease were more likely to express negative beliefs about their illness than were their non-Hispanic White counterparts, which was significantly related to more disability (Silverman, Nutini, Musa, Schoenberg, & Albert, 2009). In one study, researchers defined disability in terms of societal participation (Andresen & Brownson, 2000); however, in a second study, researchers defined disability as limitations in activities of daily living (Song et al., 2007). Such a lack of consistency in defining disability makes it difficult to interpret reports or understand the existing disability disparities in minority groups (Andresen & Brownson, 2000).

BIOLOGICAL RISK FACTORS

Risk factors in the disablement process can be any biological, social, or environmental predisposing factors that influence the disablement process (Verbrugge & Jette, 1994). As people with arthritis age, and as African Americans age, their risk for functional limitations increases (Dunlop et al., 2005; Murrock & Zauszniewski, 2011). Furthermore, a BMI over 25 and a large waist circumference are both significantly related to increased functional limitations in African American populations (Colbert et al., 2013; Newton et al., 2009; Wee et al., 2011). For the purposes of this study, it was theorized that age and BMI were biological risk factors that may predict function in middle-aged and older African American women with OA.

Age

As African Americans age, their risk of functional limitations increases (Dunlop et al., 2005; Loeser & Shakoor, 2003; Murrock & Zauszniewski, 2011). Literature on age as a risk factor for function and disability in African Americans is presented in Table 3. In five studies, researchers examined the relationships between age, function, and/or disability in African Americans (Black & Rush, 2002; Dunlop et al., 2005; Murrock & Zauszniewski, 2011; Seeman & Chen, 2002; D.F.Warner & Brown, 2011). In two of the studies researchers reported results from African American women (Murrock & Zauszniewski, 2011; D.F.Warner & Brown, 2011); in the remaining studies, the results were not reported by sex. In all five studies, older age was significantly related to functional decline. Black and Rush reported that functional decline increased with age, but the odds of functional decline were significantly lower in African Americans in comparison with their non-Hispanic White counterparts. Only one study included an examination of relationships of age and function in African Americans with arthritis (Dunlop et al., 2005). It is important that further work be done to understand how age is related to function and disability in African American women aging with OA.

BMI and Waist Circumference

Approximately 4 out of 5 African American women are overweight or obese (USDHHS, 2010). Obesity is a risk factor associated with decreased mobility, decreased movement, and increased functional limitations in African American populations (Newton, Cromwell, & Rogers, 2009; Wee et al., 2011). A synthesis of the literature on obesity, waist circumference, function, and disability in African Americans is presented in Table 4. Among African Americans, obesity has been significantly related to more disability and mortality (Al Snih et al., 2007), functional limitations (Carson, Holmes, & Howard, 2010), and mobility limitations (Koster et al., 2008).

Only five of the nine studies in Table 4 included findings on African American women (Colbert et al., 2013; Houston, Stevens, Cai, & Morey, 2005; Koster et al., 2008; Losina et al., 2011; Newton et al., 2009). African American women who were obese had more functional limitations (Houston, Stevens, Cai, et al., 2005) and walked shorter distances than did women who were not obese (Newton et al., 2009). African American women with OA had greater risk for 4-year poor function outcomes than did African American men and women and non-Hispanic White men and women who were not obese (Colbert et al., 2013). Larger waist circumference was also associated with poorer function (Colbert et al., 2013; Houston, Stevens, & Cai, 2005). In addition, obese African American women had poorer quality of life than those who were not obese (Losina et al., 2011). Only one study was conducted within a sample of African American women (Newton et al., 2009); the other studies were conducted between racial/ethnic groups.

It is well documented that high BMI/obesity is significantly related to poorer function outcomes in African American women; in the present study BMI is therefore proposed as a risk factor for function outcomes within the disablement process. The relationship between obesity and function within African American women with OA needs further examination. The present study should therefore make a significant contribution to the literature and provide new insight on how BMI/obesity influences the disablement process among African American women aging with OA. The present collective examination of biological factors as well as environmental and psychosocial factors will provide a better picture of how various factors interact and directly influence function and disability outcomes in African American women aging with OA.

Intra-Individual Psychosocial Factors

Verbrugge and Jette (1994) have explained that exacerbators can affect the presence or severity of function and disability. These exacerbators may be predisposing and may be intra-individual; that is, they derive from the person. Health care utilization, trust in health care providers, pain, pain beliefs, and depression all represent a person’s interactions with or beliefs about the environment. These exacerbators have been shown to influence health outcomes and may influence function and disability outcomes.

Health Care Utilization

Health care utilization may significantly influence health outcomes in older African Americans (Sharma, 2012). A synthesis of the literature on health care utilization rates and relationships to outcomes in African Americans is therefore presented in Table 5. Six articles were found in which researchers examined health care utilization and related health outcomes in African Americans. All six studies were comparative. Researchers reported that African Americans were less likely to utilize health care in comparison with non-Hispanic Whites even after controlling for access to care/insurance (Sharma, 2012; Weinick, Zuvekas, & Cohen, 2000). In addition, in one study researchers reported that lack of health care utilization was related to the disparities in health between

African Americans and non-Hispanic Whites (Sharma, 2012). No studies examined health care utilization or health outcomes within African Americans. An important pathway to better function proceeds through rehabilitative care (Lysack, MacNeill, & Lichtenberg, 2001). If African Americans are not utilizing health care, they may have poorer function. One reason why African Americans might not utilize health care or rehabilitative care may be their lack of trust in health care providers (Greiner et al., 2005).

Trust in Health Care Providers

The literature shows that African Americans are likely to distrust their health care providers (Boulware, Cooper, Ratner, LaVeist, & Powe, 2003; Hattery & Smith, 2007), and such distrust in health care providers may influence health care decisions and health outcomes in African American populations (Greiner et al., 2005). A synthesis of literature on trust in health care providers and its relationship to health outcomes and health care decisions in African Americans is presented in Table 6. Eleven studies were found. In three of these studies, African Americans were more likely to distrust health care providers than were non-Hispanic Whites (Boulware, Cooper, Ratner, LaVeist, & Powe, 2003; Halbert, Armstrong, Gandy Jr, & Shaker, 2006; Nicholson et al., 2006). In three studies, researchers conducted studies within African Americans (Owsley et al., 2006; Sheppard, Mays, LaVeist, & Tercyak, 2013; Watkins et al., 2012). Watkins and colleagues (2012) reported that African Americans' lack of trust in health care providers was the second most common difficulty for their receiving eye care. Overall, African

Americans’ distrust in health care providers was significantly related to less utilization of preventive health care (Greiner et al., 2005; Musa et al., 2009; Sheppard et al., 2013), lower adherence to medication regimens (Saha, Jacobs, Moore, & Beach, 2010), and less visits with health care providers (Nicholson et al., 2006; Owsley et al., 2006). Caterinicchio (1979) found that increased trust in health care providers was related to greater perceived positive health gains from health care treatment. No studies were found that had an examination of trust in health care providers within a sample of African American women or African Americans with OA. In addition, no studies where found that had an examination of whether trust in health care providers influenced function or disability in African Americans.

Researchers have reported that trust in health care providers is significantly related to adherence to medical treatments and perceived beliefs about health care; what is not known is whether trust in health care providers has a relationship with disablement outcomes in African Americans. There were no reports of trust in health care providers being directly related to health outcomes; however, trust in health care providers may be indirectly related to health outcomes in African Americans. If African American women are not comfortable seeking care with physicians, this may create a decline in health (Greiner et al., 2005; Sharma, 2012) that can lead to more functional limitations. Given an increase in functional limitations, women’s trajectory from function to disability may be hastened.

Pain and Pain Beliefs

Researchers have reported that pain is significantly related to functional decline and more disability among African Americans with OA (Baker & Whitfield, 2006; Parmelee, Harralson, McPherron, DeCoster, & Schumacher, 2012), and pain beliefs have been significantly related to health outcomes in African Americans with chronic conditions (M.S. Jordan, Lumley, & Leisen, 1998). A synthesis of the literature on pain, pain beliefs, function, disability, and health outcomes in African Americans is presented in Table 8. Twenty-one studies were found. In 16 studies, researchers examined pain; in five studies, researchers examined pain beliefs. In seven of the studies on pain, an increase in pain was significantly related to poorer function and/or more disability (Baker & Whitfield, 2006; Cano et al., 2006; Clark, Mungai, Stump, & Wolinsky, 1997; Cruz-Almeida et al., 2014; J.M.Jordan et al., 2007; Ndao-Brumblay & Green, 2005; Weiner et al., 2003). Among the studies on pain, only two used a within-group approach for studying pain and outcomes in African Americans. (Baker & Whitfield, 2006; Ndao-Brumblay & Green, 2005). In four of the studies, researchers examined pain and function in African Americans and other racial/ethnic groups with OA (Allen et al., 2012; Cruz-Almeida et al., 2014; J.M. et al., 1997; Parmelee et al., 2012). In Parmelee and colleagues' study (2012), although African Americans with OA reported more pain than did non-Hispanic Whites with OA, there were no group differences in the association of pain and disability. In J.M. Jordan and colleagues' study (1997), knee pain was significantly associated with difficulty in performing functional tasks among African Americans and non-Hispanic Whites with OA. In another study it was reported that pain was not significantly associated with function or disability in African Americans (Grubert, Baker, McGeever, & Shaw, 2013). Horgas, Yoon, Nichols, and Marsiske (2008) reported that there was a stronger association between pain and disability in non-Hispanic Whites than in African Americans.

Five studies on pain beliefs included African Americans in the sample. All five studies compared the pain beliefs and outcomes of African Americans and the pain beliefs and outcomes of non-Hispanic Whites. In two studies, African Americans reported less control over their pain in comparison with their non-Hispanic White counterparts (Ruehlman, Karoly, & Newton, 2005; Tan, Jensen, Thornby, & Anderson, 2005). In only one study researchers examined the pain beliefs of women with arthritis (M.S. Jordan et al., 1998). In that study, African American women with rheumatoid arthritis were less likely to ignore their pain than were non-Hispanic White women with rheumatoid arthritis. In addition, in only one study was there an examination of pain beliefs and their association with function and disability. Tan and colleagues (2005) reported that among African Americans and non-Hispanic Whites, belief in one's personal control over pain and belief that one is unable to function because of pain were both significant predictors of disability.

There is a dearth of literature with a focus on pain or pain beliefs as predictors of function and/or disability within older African American women with OA. Further work is needed to understand the relationship that pain and pain beliefs have with function and disability in African American women with OA. Pain beliefs have been significantly related to disability in non-Hispanic or multi-ethnic groups with chronic conditions (Main et al., 2010). For example, in a study of adults with chronic pain, Geisser and Roth (1998) reported that participants who believed that pain signaled harm had significantly more disability. Further work on pain and pain beliefs within African American women with OA is needed. Using a within-group approach, as opposed to a multi-ethnic comparative approach, can provide a better understanding of the unique relationships that pain and pain beliefs have with function and/or disability outcomes (Baker, Buchanan, & Corson, 2008), specifically within African American women with OA.

Depression

Researchers have reported that depression is significantly related to function and health outcomes in African Americans (Bruce, 2008; Dickens & Creed, 2001; Graney, 2000). In Table 8, nine studies are presented in which researchers examined relationships between depression, function, and disability in African Americans and mixed ethnic samples. In two of the studies, researchers examined the relationship between depression and function within a sample of African Americans (Baker & Whitfield, 2006;Thorpe, Clay, Szanton, Allaire, & Whitfield, 2011). In six, researchers reported that function was significantly related to depressive symptoms (Ayotte, Allaire, & Whitfield, 2013; Baker & Whitfield, 2006; Dunlop et al., 2005; Gitlin et al., 2007; Mendes de Leon & Rajan, 2014; Thorpe et al., 2011). Jang, Chiriboga, Kim, and Phillips (2008) reported that depression was significantly related to function in the younger cohort of African American women; however, it was not significantly related to function in the older cohort of African Americans. Creamer, Lethbridge-Cejku, and Hochberg (2000) reported no significant relationship between depression and disability among African American and non-Hispanic Whites with OA. Parmelee and colleagues (2012) reported that there was no significant relationship between depression and disability in African American women with OA. Mendes de Leon and Rajan (2014) reported that depression was significantly related to disability onset. Depression was consistently found to be related to function in African Americans, but significant relationships between depression and disability were reported in one out of three studies.

For the purposes of the present study, depression is hypothesized as a predictor of function. It is important to understand whether depression influences function in middle-aged and older African American women with OA, because this can guide intervention development. Treatment of depression has significantly improved function outcomes in older adults (Oslin, Streim, Katz, Edell, & TenHave, 2000) and in older adults with arthritis (Lin et al., 2003). If depression is found to predict function in the present study, the next step will be to develop culturally appropriate interventions to treat depression for middle-aged and older African American women with OA, which may improve function and possibly slow their trajectory to disablement.

EXTRA-INDIVIDUAL FACTORS

Verbrugge and Jette (1994) explain that exacerbators that may affect the presence or severity of function can also be extra-individual, deriving from the environment. African Americans frequently experience racial discrimination and stress from discrimination (Jackson & Sellers, 2001) as well as difficulty accessing health care (Agency for Healthcare Research and Quality, 2013) within their environments, which may influence their function and disability outcomes.

Racial Discrimination and Stress from Racial Discrimination

African Americans' life-long experience of racial discrimination can have a cumulative effect on their overall health outcomes and health behaviors (Blank et al., 2004; Casagrande et al., 2006; Hattery & Smith, 2007); however, it remains unclear whether an accumulation of racial discrimination throughout the lives of African American women may influence function and disability outcomes in older adulthood. In addition, when racial discrimination is perceived as stressful, the health outcomes in African Americans may be influenced (Harrell et al., 2011; Landrine & Klonoff, 1996; Pascoe & Smart Richman, 2009). A synthesis of the literature on racial discrimination and stress from racial discrimination in African Americans and associated health outcomes is presented in Table 9.

In 15 studies, researchers examined the relationships among racial discrimination, stress from racial discrimination, and health outcomes in African Americans. In 10 of the studies, researchers used a within-group approach (Borrell, Kiefe, Williams, Diez-Roux, & Gordon-Larsen, 2006; Burgess et al., 2009; Chae, Lincoln, Adler, & Syme, 2010; Coogan et al., 2014; Estrada-Martinez et al., 2012; Guyll, Matthews, & Bromberger, 2001; Kwate et al., 2003; Mouton et al., 2010; Subramanyam et al., 2012; Troxel, Matthews, Bromberger, & Sutton-Tyrrell, 2003); three of these studies were specific to

African American women (Guyll et al., 2001; Kwate et al., 2003; Mouton et al., 2010; Troxel et al., 2003). Researchers reported that in African Americans, racial discrimination was significantly associated with worse self-reported physical and mental health (Borrell et al., 2006) and stressful emotions (Peters, 2006). Stress from racial discrimination was significantly related to increased asthma risk (Coogan et al., 2014) and unhealthy behaviors (Pascoe & Smart Richman, 2009). In addition, African American women who attributed unfair treatment to racial discrimination were more likely to have had more carotid plaque (Troxel et al., 2003) and higher diastolic blood pressures (Guyll et al., 2001) than were African American women who did not attribute unfair treatment to racial discrimination. Kwate and colleagues (2003), who examined the effects of cumulative racial discrimination, reported that lifetime racial discrimination was significantly related to more common colds and worse perceived health in African American women.

Racial discrimination was not significantly associated with blood pressure in African Americans (Peters, 2006) and was no longer significantly related to poorer diabetes outcomes when researchers controlled for health status and health care access (M.E.Peek, Wagner, Tang, Baker, & Chin, 2011). Kwate and colleagues (2003) reported that appraised stress from racial discrimination was not significantly related to any negative health behaviors or health outcomes. The literature on racial discrimination and stress from racial discrimination and health outcomes in African Americans is mixed. There were no studies in which researchers examined the relationship between racial discrimination and/or stress from racial discrimination and function or disability in African American women with OA.

Further work is needed in order to understand the relationships among racial discrimination, stress from racial discrimination, and disablement in African Americans. Kwate and colleagues (2003) reported cumulative effects of racial discrimination on health outcomes in African American women: experiencing racial discrimination throughout one's lifetime was significantly related to more psychological distress ($r = .40$, $p < .001$), more diseases over the life course ($r = .23$, $p < .05$), and more common colds ($r = .41$, $p < .05$). This is important, because it speaks to the cumulative effects of racial discrimination. Whether or not the cumulative effects of racial discrimination affect function or disability is unknown, so this will be examined in the present study. If middle-aged and older African American women with OA have experienced racial discrimination throughout the life course and have perceived it to be stressful, or experienced depressive symptoms related to it, they may retreat from social roles. In this study it was hypothesized that appraised stress from racial discrimination mediated the relationship between racial discrimination and disability in middle-aged and older African American women with OA. In addition, it was hypothesized that depression mediated the relationship between racial discrimination and disability.

Health Care Access

Limited health care access can influence health outcomes in African American populations (Henry J. Kaiser Family Foundation, 2004); however, it remains unclear whether lack of health care/health insurance access is significantly related to function and/or disability in African American women with OA. According to the Agency for Healthcare Research and Quality (2013), 20% of African Americans lack a usual source of health care, in comparison with 16% of non-Hispanic Whites. A synthesis of the literature on health care access and its associations with health outcomes and/or function and disability in African Americans is presented in Table 10. Nine studies were found. All but one of those studies (Becker, Gates, & Newsom, 2004) compared African Americans with other racial ethnic groups. African Americans were more likely to lack insurance or a usual source of health care in comparison to non-Hispanic Whites (Agrawal et al., 2012; Weinick et al., 2000). Weinick and colleagues (2000) reported that African Americans were more likely to lack a usual source of health care than were non-Hispanic Whites; once the researchers controlled for health care access, health disparities still existed between the two groups. In addition, a lack of health care access and/or health insurance was significantly related to lower quality of life (Bharmal & Thomas, 2005), higher hemoglobin A1C levels (Harris, 2001; Rhee et al., 2005), and higher blood pressure (Harris, 2001) in African Americans. Bharmal and Thomas (2005) explored the relationship between health care access and physical function: a lack of health care access was significantly related to lower physical function scores and worse mental health scores among African Americans and non-Hispanic Whites. In addition, Kail and Taylor (in press) examined the relationship between insurance type and functional limitations among African Americans and non-Hispanic Whites: market insurance and employer provider insurance were related to lower functional limitations in the group. No studies were found in which researchers examined how health care access influenced function and disability within middle-aged or older African American women.

Health care access is an environmental factor that may uniquely shape the disability experience of African Americans (Copeland, 2005); it is important to examine how it may influence disablement outcomes among African American women aging with OA.

SUMMARY

In summary, it is well documented that African American women with OA have poorer function and more disability than do non-Hispanic White women with OA. Although researchers have examined how age, BMI, pain, and depression influence these outcomes, further exploration is needed to understand what other factors may influence them. The literature shows that trust in health care providers, pain beliefs, health care utilization, racial discrimination, stress from racial discrimination, and health care access may influence health outcomes in African Americans, but few researchers have examined whether these factors influence disablement outcomes in middle-aged and older African American women with OA.

The results from the present study provide support for the development of interventions to help improve function and slow the disablement process among African American women aging with OA. “As data accumulate on the racial/ethnic differences in arthritis prevalence and impact, we need to develop culturally appropriate interventions for the populations most affected” (Bolen et al., 2010, p. 3). The knowledge gained from this study can set the stage to develop interventions for African American women aging with OA and to further test predictors of function and disability in African American women aging with other types of chronic and disabling conditions.

Table 1: Function in African Americans (AA), non-Hispanic Whites

Authors, Year	Design	Sample	Objective	Findings
Allen et al. (2009)	Cross-sectional	A sample of 1,368 participants of various racial/ethnic backgrounds from the Johnson County Osteoarthritis project, with 32% being African American	To examine the differences in pain and function between AA and NHW with OA	AA with knee OA had significantly worse function scores ($p < .0001$) than NHW with knee OA. Differences were no longer significant after controlling for BMI and depression.
Allen et al. (2010)	Cross-sectional	The sample included 491 AA and NHW with OA.	To examine what factors contribute to racial differences in pain and function between AA and non-Hispanic Whites with OA	AA had poorer function than NHW ($b = 0.59$, $p < .001$). Researchers reported that racial differences in function were largely attributed to psychological factors such as arthritis, self-efficacy, and coping.
Allen (2010)	Literature review	Varied among studies	The objective was to summarize literature on how arthritis varied across racial/ethnic groups.	Pain and functional limitations were greater among AA with knee OA than NHW with OA.
Bolen et al. (2010)	Cross-sectional	A multi-ethnic sample of 85,784 adults with arthritis. There were 12,063 AA in the sample.	To describe the prevalence of physician-diagnosed arthritis and the racial differences in activity and work limitations.	AA were 1.3 times more likely to have activity limitations ($p < .05$) than their non-Hispanic White counterparts, after controlling for age and BMI.

Table 1 (continued)

Burns et al. (2007)	Cross-sectional, self-report on function and disability outcomes	The sample included 518 older adults; 131 were AA with OA, and 387 were NHW with OA.	The objective was to examine differences in self-reported disability in older adults with OA.	AA had significantly poorer walking performances ($p < .01$) in comparison with their non-Hispanic White counterparts even after controlling for BMI, education and income, and comorbidities.
Colbert et al. (2013)	Cross-sectional, self-report survey	3,695 AA and NHW with knee OA or at high risk for knee OA	The objective was to examine if AA had greater risk (vs. NHW) of poor 4-year function outcome within strata defined by sex and BMI.	AA women were more likely to experience poorer 4-year functional outcomes in comparison with non-Hispanic White women with OA, even after adjusting for age, education, and income (OR = 1.75, 95% CI: 1.38–2.21).
Elliott et al. (2007)	Cross-sectional design consisting of two in person interviews and a clinic visit.	The sample included a mixed ethnic sample of 3,165 adults over the age of 45 in the Johnson County Osteoarthritis Project.	The objective was to evaluate relationships between specific joint symptoms and functional decline in adults with OA.	AA took longer to complete performance tasks such as timed chair stands and timed walks in comparison with NHW ($p < .0001$).
J.M. Jordan, Linder, Renner, & Fryer (1995)	Cross-sectional	A sample of 1,432 AA and NHW with OA	To examine arthritis and disability prevalence among rural adults	Hip and knee OA, as well as hip and knee pain, were significantly related to decreased functional ability in both ethnic groups.
J.M. Jordan et al. (1996)	Population-based study that included	The sample included 1,197 AA 45 years of age and older and	To examine racial differences in self-reported function between AA and	AA were more likely to report difficulty with functional tasks than NHW ($p < .04$); 43% of the sample reported difficulty with one or more

Table 1 (continued)

	review of published reports from the Johnston County Osteoarthritis Project	NHW 45 years of age and older in the Johnson County Osteoarthritis Project.	NHW	functional tasks.
Sowers et al. (2006)	Cross-sectional self-report, community based study	211 middle-aged AA women and 669 non-Hispanic White women with knee OA and/or self-reported knee pain	To evaluate association of physical functioning with radiographic knee osteoarthritis, self-reported knee pain, and body composition	AA women had more decline in physical functioning than non-Hispanic White women ($p <$ .01), but also had higher rates of knee OA.
Wolinsky et al. (2014)	Longitudinal study spanning over 9 years and based on self-report	998 African American men and women 49–65 years of age	To evaluate heterogeneity of lower extremity functional trajectories in older AA.	Heterogeneity in functional outcomes was prevalent within the AA cohort. A total of 45% of the sample belonged to stable categories of good, fair, or poor function. The remainder of the sample was disbursed across other categories such as having good function with large and quick decline. Various health conditions (depression, angina) and health behaviors (smoking) predicted function categories.

Table 2: Disability Outcomes in African Americans (AA), non-Hispanic Whites (NHW), Activities of Daily Living (ADL)

Citation	Design	Sample	Disability Definition	How was disability measured?	Objective	Findings
Andresen and Brownson (2000)	Cross-sectional Behavioral Risk Factors Surveillance System random dialing	Mixed racial/ethnic sample of 3,000 women over 40 (52% of 749 AA had arthritis and 41% of 774 NHW had arthritis).	Disability was defined as participation in societal activities.	Disability was measured by work status limitations and ADLs; the World Health Organization's model of disablement was used.	To investigate the relationship of ethnicity to disability	AA reported more disability (7% of AA) than non-Hispanic White women (4% of the non-Hispanic White women). Chronic conditions were associated with more disability and higher income, and more education was associated with less disability.
Silverman et al. (2009)	Mixed methods approach that used interviews and survey data	132 older African American and NHW with either knee or hip OA or ischemic heart disease	No definition provided	Self-report of six activities of daily living	To explore what types of responses to illnesses were expressed by this group of older adults.	AA were more likely to express negative beliefs about their illness than NHW, and negativity was significantly related to more disability.
Sims et al. (2009)	Cross-sectional study;	The sample included 65 AA with OA and 112 NHW with OA.	No definition of provided	Researchers measured physical and	To determine differences in gait mechanics between	Although there were no significant differences in

Table 2 (continued)

	researchers used radiographic data, observation, and self – report.			psychological disability.	AA and NHW with knee OA.	radiographic disease severity between the groups, AA had significantly slower walking speeds (*p* = .009) and more disability in comparison with NHW (*p* < .001).
Song et al. (2007)	Secondary analyses from the 1998–2004 National Health and Retirement longitudinal study	A mixed ethnic sample of 7,257 AA, NHW, and Hispanic/Latinos, 51 years of age and older with arthritis	Researchers stated that disability was defined as a “gap between a person’s capabilities and environmental demands (e.g., limitations in ADL tasks)” (Song et al., 2007, p. 1059)	Six ADLs were measured. ADL disability was considered present if participants reported disability in one or more ADL tasks.	To examine racial/ethnic differences of disability onset among older adults with arthritis.	The 6-year cumulative ADL disability incidence rates were higher among AA (28.0%, *n* = 1,001) in comparison with NHW (16.2%, *n* = 5,518).

Table 3: Age, Function, and Disability in African Americans (AA), non-Hispanic Whites (NHW)

Citation	Design	Sample	Objective	Findings
Black and Rush (2002)	A population-based longitudinal study	A mixed ethnic sample of 365 community dwelling older adults 75 years of age and older.	To examine the influence of cognitive status on functional disability	Functional decline increased with each advancing year of age (OR = 1.04, 95% CI: 1.01–1.06). However, AA had significantly lower odds of functional decline than NHW.
Dunlop et al. (2005)	Longitudinal descriptive study	The sample included 4,992 AA, Hispanics, and NHW, 65 years of age and older with arthritis.	To examine prevalence of functional limitations among adults over 65 with arthritis	Among AA, functional decline increased with every decade of life (65–74 years of age: 18.67%, 75–84 years of age: 24.68%, >85: 31.89%).
Murrock and Zauszniewski (2011)	Descriptive study from a larger longitudinal analysis	The sample included 126 community dwelling AA women ages 35 and older.	To test the psychometrics of the physical component scale among African American women	As age increased among the women, function decreased ($r = -.42$, $p < .01$).
Seeman and Chen (2002)	Longitudinal study from the MacArthur Successful Aging Study	The sample included 4,030 non-Hispanic White and AA adults 70-79 years of age.	To examine if lifestyle and psychosocial factors influenced function outcomes in older adults with and without chronic conditions	Among adults who had a history of cancer or a history of hypertension, younger age was associated with less functional decline ($p < .01$).

Table 3 (continued)

D.F.Warner and Brown (2011)	Correlational study, secondary analysis that used data from the U.S. Health and Retirement Study	The sample consisted of 8,701 men and women that were non-Hispanic White, African American and Mexican American ages of 53–75.	To determine how population and age trajectories of functional impairment varied between racial/ethnic groups	Function and disability remained stable among all the groups except AA women, who showed accelerated rates of function and disability as they aged. Women had an increase of 0.0617 in limitations for every 1-year increase in age, which was about double the rate experienced by other groups.

Table 4: BMI, Waist Circumference (WC), Function, Disability, and Health Outcomes in African Americans (AA), non-Hispanic Whites (NHW)

Citation	Design	Sample	Objective	Findings
Al Snih et al. (2007)	Longitudinal study using height and weight measurements and self-report	The sample included 8,359 NHW, 1,931 AA, and 2,435 Mexican Americans, all ages 65 years or older without disabilities at baseline.	To examine the associations of BMI with disability	Higher BMI increased the odds of disability (24.2, 95% CI: 23.3-25.2). Disability and mortality increased as BMI increased among all ethnic groups.
Carson et al. (2010)	Cross-sectional secondary analysis of Piedmont Health Survey of the Elderly	4,136 adults 65 years of age and older. AA were 52% of the sample and NHW were 48% of the sample.	To explore associations between weight change, function, and age among older adults	Weight gain and weight loss were associated with higher odds of functional limitations between ages 50 and 65 (OR = 1.19, 95% CI: 1.04–1.36, and OR = 1.58, 95% CI: 1.41–1.78,) compared with those who maintained their weight across the entire sample.
Colbert et al., (2013)	Cross-sectional self-report using Western Ontario & McMasters Universities	3,695 AA and non-Hispanic Whites with knee OA or at high risk for knee OA	To examine if AA in the Osteoarthritis Initiative study had greater risk of poor function when stratified by race and BMI	AA women with high BMI had higher odds of poor function in comparison with non-Hispanic White women high BMI (OR = 1.75, 95% CI: 1.38–2.21). AA women with larger WC had higher odds of poor function than non-Hispanic White women with large WC (OR = 1.77, 95% CI: 1.41–2.22).

Table 4 (continued)

Houston, Stevens, Cai, et al., (2005)	Cross-sectional self-report	11,177 African American and non-Hispanic White men and women 52–75 years of age	To examine associations of weight history with function and disability in AA and NHW.	In AA women, obesity was significantly related to higher odds of mild functional limitations (OR = 2.71, 95% CI: 1.14–6.41) and severe functional limitations (OR = 6.01, 95% CI: 2.53–14.26).
Houston, Stevens, & Cai, (2005)	Longitudinal cohort study	9,416 African American women and non-Hispanic White men and women ages 45–64, participating in the Atherosclerosis Risk Community study	To examine relationships of abdominal fat and obesity with function	In AA women the odds ratios (95% CI) associated with a one standard deviation increment in WC (13.3 cm) for severe functional limitations were 2.36 (2.00–2.79), 1.41 (1.25–1.58).
Koster et al. (2008)	Prospective observational cohort study	2,982 African American and non-Hispanic White men and women ages 70–79, participating in the Health Aging and Body Composition Study.	The objective was to examine joint associations of physical activity and adiposity measures (BMI and body fat percentage).	AA women with a BMI greater than or equal to 30 had higher odds of mobility limitation than African American women with lower BMI (OR = 2.09, 95% CI: 1.58–2.75).
Losina et al. (2011)	Cross-sectional study that used the osteoarthritis policy model, a computer-based, state transition simulation estimating quality-adjusted life expectancy in	Sample included 85 AA, 996 Hispanics, and 369 non-Hispanic Whites ages 50–84 years.	To estimate quality of life years lost due to obesity and knee OA	AA women represented 6.1% of the population of persons 50–84 years of age in the United States, but accounted for an estimated 8.9% of all quality-adjusted life years lost due to obesity and symptomatic knee osteoarthritis.

Table 4 (continued)

	persons with obesity, knee osteoarthritis, or both			
Newton et al. (2009)	Cross-sectional study, questionnaires and self-report	A sample of 133 community dwelling older African American women	To examine the relationship between obesity and physical performance	Women who were obese walked shorter distances, had slower walking speeds ($p < .0001$) and lower rates of self-reported daily activities than women who were not obese.
Sowers et al. (2006)	Cross-sectional, self-report, community-based study	211 middle-aged African American women and 669 non-Hispanic White women with knee OA or reported knee pain	To evaluate association of function with radiographic knee OA and pain	AA in the high fat category (>36 kg) had poorer times in stair climbing ($p < .001$).

Table 5: Health Care Utilization and Health Outcomes in African Americans (AA), non-Hispanic Whites (NHW)

Citation	Design	Sample	Objective	Findings
Chin, Zhang, and Merrell (1998)	Cross-sectional based on self-report	The sample included 1,376 AA and non-Hispanic Whites ages 65 and older with diabetes.	To determine if African American Medicare recipients with diabetes were at increased risk for poor quality of care or high resource utilization	15% of AA reported having a health problem for which they should have seen a health care provider yet did not in comparison with 9% of NHW (*p* = .15).
Dunlop, Manheim, Song, and Chang (2002)	Cross-sectional based on self-report	The sample included 6,152 Hispanic, African American, or non-Hispanic White adults who provided health care utilization information in 1995	To examine the role of economic access across genders and racial/ethnic groups in health care utilization	AA men were significantly less likely than non-Hispanic White men to see a physician, regardless of predisposing factors (Model 1, OR =.43), health needs (Model 2, OR = 0.32), or economic access factors (Model 3, OR = 0.49).
Fiscella, Franks, Doescher, and Saver (2002)	Cross-sectional analysis of the Community Tracking Survey (1996–1997)	60,446 AA, NHW and Hispanics ages 18–64.	To examine the effect of access barriers on ethnic disparities in health care	After controlling for predisposing factors, AA were less likely than NHW to visit with a mental health care professional (OR = 0.46; 95% CI: 0.37– 0.55).
Gaskin, Dinwiddie,	Cross-sectional based on	The sample included	To examine if	The odds of AA having

Table 5 (continued)

Chan, and McCleary (2012)	self-report	17,514 AA, NHW, and Hispanics.	racial/ethnic disparities in health care were related to racial segregation	at least one office-based physician visit were 30% lower than for NHW. AA living in predominantly non-Hispanic White zip codes were less likely to have a physician visit than were NHW residing in the same zip codes.
Sharma, (2012)	Cross-sectional based on self-report	The sample included 1,169 NHW and 200 AA.	To examine the relationships of health care utilization with health disparities in AA and NHW	In comparison with NHW, older AA had significantly poorer health outcomes despite access to care and insurance status ($p < .05$). Lack of health care utilization accounted for some of this disparity.
Weinick et al. (2000)	Longitudinal	The sample consisted of AA, NHW, and Hispanics. The sizes of the samples across the years were 38,336 in 1977, 33,536 in 1987, and 20,793 in 1996.	To describe changes in health care access and health care utilization in AA, NHW, and Hispanics over two decades	When insurance coverage was controlled for, AA were still less likely to have a usual source of care or utilize ambulatory care in comparison NHW ($p < .05$).

Table 6: Trust in Health Care Providers and Health Outcomes in African Americans (AA), non-Hispanic Whites (NHW)

Citation	Design	Sample	Objective	Findings
Gordon, Street, Sharf, Kelly, and Souchek (2006)	Cross-sectional study that used self-report	The mixed ethnic sample included 103 AA and NHW visiting either a thoracic surgery clinic or an oncology clinic.	To examine if racial differences in trust in physicians was related to patient–physician communication and/or lung cancer treatment	Post visit trust was significantly lower in AA patients in comparison with non-Hispanic White patients (8.0 vs. 9.3, respectively; *p* = .02).
Boulware et al. (2003)	Cross-sectional study, telephone surveys	The sample included 49 AA and 69 NHW all over the age of 18, living in Baltimore.	To assess the relationship between race and trust in physicians, hospitals, and health insurance companies.	AA were less likely to trust their physicians than NHW (adjusted absolute difference 37%; *p* = .01).
Caterinicchio (1979)	Cross-sectional study	A mixed ethnic sample of NHW, Asians, AA, and Asian outpatients from an ambulatory clinic. There were 52 AA in the sample.	To test a path-analysis model of patient–physician treatment relationships, client anxiety, and pain behaviors	Greater trust in physicians was significantly related to greater perceived positive health gains from health care treatment (*b* =.64, *p* < .001).
Greiner et al.	Cross-sectional	The sample included 203 AA, 6	To examine	Low trust in health care providers was

Table 6 (continued)

(2005)	based on self-report	Hispanics, and 64 NHW all over the age of 40 who were classified as low income. The sample was 69% AA.	attitudes, knowledge, and beliefs surrounding colorectal cancer screening among a group of multiethnic adults	significantly related to less fecal occult blood testing (OR = 2.12, $p < .01$) and less endoscopies (OR = 1.95, $p < .05$) across the sample.
Halbert et al. (2006)	Cross-sectional study that used a national survey	The sample included 432 AA and 522 NHW.	To evaluate the association of TCHP and prior health care experiences	AA were more likely to report low trust in their health care providers in comparison with NHW ($x^2 = 12.40$, $p<.001$).
Musa et al. (2009)	Cross-sectional study that used telephone-based self-report	The sample included 1,684 AA and NHW ages 65 and older enrolled in the Medicare Enrollment Study.	To detect if racial/ethnic differences existed in the relationship between trust in health care and preventative service use	AA had significantly less trust in their physicians than NHW ($p < .001$), and this lack of trust was significantly related to lack of utilization of preventative care.
Nicholson et al. (2006)	Cross-sectional descriptive study that used self-report	The sample included 163 AA and 111 non-Hispanic White patients who were seeking care for headaches.	To detect if racial/ethnic differences existed in level of trust in care among patients seeking care for migraine headaches	AA reported lower trust in the medical community than NHW ($p < .001$, $\eta^2 = .26$); and the lower the trust, the less likely they were to have ever been seen by a physician for migraine care or prescribed medication.

Table 6 (continued)

Owsley et al. (2006)	A qualitative descriptive study that used focus groups	The sample included 119 AA ages 59–97, and 35 eye care providers.	To identify perceived barriers to eye care among older AA	The second most common difficulty in receiving eye care reported by the participants was their lack of trust in eye care providers.
Sheppard et al. (2013)	Cross-sectional based on self-report	The sample included 100 African American women who were at an increased risk for carrying a BRCA1/2 mutation.	To examine the influence of sociocultural factors on genetic counseling and testing in AA women	Lower medical mistrust was significantly related to less genetic counseling ($B = -0.26$, $p < .01$.
Saha, Jacobs, Moore, and Beach (2010)	Cross-sectional study that used self-report surveys	The sample included 1,104 AA and 201 non-Hispanic Whites who were diagnosed with HIV and part of the John Hopkins HIV cohort study.	To examine if greater trust in health care providers decreased health disparities among AA	AA reported lower trust in their health care providers in comparison with non-Hispanic Whites (8.9 vs. 9.4 on a 0–10 scale; $p < .001$). AA who reported less than complete trust in their physicians had lower adherence to antiviral medication regimens than NHW adjusted (OR = 0.40; 95% CI: 0.25–0.66).
Watkins et al. (2012)	Cross-sectional study that used	The sample included 68 African American caregivers of the	To explore the relationship between	The participants who were more trusting of their physicians were more likely to

Table 6 (continued)

self-report	sample included family members with dementia.	trust in physicians and end of life care decisions.	choose mechanical ventilation for their loved ones (*p* = .0005) for their loved ones than participants who were less trusting of physicians.

Table 7: Pain, Pain Beliefs, Function, Disability, and Health Outcomes in African Americans (AA), non-Hispanic Whites (NHW)

Citation	Design	Sample	Objective	Findings
Allen et al. (2012)	Cross-sectional	A mixed ethnic sample of 2,748 AA and NHW from the Johnson County Osteoarthritis project	To examine if household and occupational tasks contributed to differences in chronic pain between AA and NHW	AA who worked inside the home reported significantly higher pain scores (*b* = 1.35; 95% CI: 0.63– 2.07, *p* < .001) than NHW who worked inside the home. AA who currently worked outside the home also had significantly higher pain scores [*b* = 1.61 (95% CI: 0.42–2.80) than NHW.
Appelt, Burant, Siminoff, Kwoh, and Ibrahim (2007)	Cross-sectional	The sample included 261 African American males and 330 non-Hispanic White males who were veterans and had OA, ages 50-80.	To examine relationships between demographic characteristics, beliefs about arthritis, and aging	Males 60–69 years of age (*p* = .04) and 70 years of age and older (*p* = .02) were significantly more likely to believe that people should expect to live with pain as they grew older.
Baker and Whitfield (2006)	Cross-sectional	The sample included 247 community dwelling AA ages 50 and from the Baltimore Study on Black Aging.	To examine relationships between physical function with pain, comorbidities and psychosocial factors	Multiple pain locations *(b* = 0.25, *p* < .01) and pain intensity (*b* = 0.30, *p* < .01) were significant predictors of poorer physical function.

Table 7 (continued)

Bruce, Fries, and Murtagh (2007)	Cross-sectional, data derived for the Health Assessment Questionnaire	Sample included 4,730 AA, NHW, and Hispanic patients with RA. There were 283 AA.	To examine disparities of pain and disability among patients with rheumatoid arthritis	Pain scores were the highest among AA ($p < .05$) in comparison with NHW and Hispanics.
Cano et al. (2006)	Cross-sectional, based on self-report surveys	The sample included 139 NHW, Hispanics, AA, and Asian adults with chronic pain; there were 58 AA.	To examine relationships of demographic variables such as race and education with coping, pain, and disability in adults with chronic pain.	AA had significantly higher rates of pain severity than NHW ($p < .05$). There was a positive relationship between pain and disability ($p < .01$) among the sample.
Clark et al. (1997)	Cross-sectional study based on self-report	The sample included 8,727 AA, NHW and Hispanic participants, 51–61 years of age; with 1,590 AA in this age cohort. There was 4,510 AA, non-Hispanic Whites, and Hispanics ages 71–81, with 603 being AA.	To examine relationships between health behaviors, chronic diseases, and impairments with lower body functions among two age cohorts of older adults	Among AA in both age cohorts, difficulty with pain was positively associated with poorer lower body function ($p < .0001$).

Table 7 (continued)

Cruz-Almeida et al.(2014)	Cross-sectional based on self-report	The sample included 147 AA with knee OA and 120 NHW with knee OA. Participants were 45–85 years of age.	To characterize differences between clinical and experimental pain between groups	In AA pain pressure sensitivity was a significant predictor of poorer function ($p < .01$).
Day and Thorn (2010)	Cross-sectional	The sample included 122 African American and non-Hispanic White residents with chronic pain in Alabama; 74% were AA and 79% were women.	To examine relationships between demographic variables and pain among rural residents with chronic pain	AA had higher pain intensity scores ($p < .05$) and pain interference scores ($p < .01$) in comparison with NHW.
Green, Baker, Smith, and Sato (2003)	Retrospective descriptive study	The sample included 163 AA over the age of 50 with chronic pain and 1,906 NHW over the age of 50 with chronic pain.	To examine the effects of chronic pain cross-culturally in older Americans	AA reported significantly more pain (3.41 +/- 1.54 vs. 2.63 +/- 1.37; $p < .05$) than NHW. Chronic pain had more of an effect on health status and quality of life in AA than in NHW.
Green, Baker, and Ndao-Brumblay (2004)	A prospective cross-sectional design using survey methodology	The sample included 324 AA receiving treatment for chronic pain and 300 NHW receiving treatment for chronic pain.	To evaluate health care utilization and pain management referrals in a racial/ethnically diverse sample	Although not statistically significant, AA were more likely than NHW to agree that pain medications could not control their pain and that good patients did not discuss their pain with others.

Table 7 (continued)

Grubert et al. (2013)	A Cross-sectional study that used secondary data from the Health and Retirement Study	The sample included 11,032 AA, NHW, and Hispanics over the age of 65	To examine racial/ethnic differences in physical pain and examine pain as a mediator	There was no significant association between any level of pain and physical activity among AA.
Horgas, Yoon, Nichols, and Marsiske (2008)	Cross-sectional study that used self-report	The sample included 115 non-Hispanic White and African American community dwelling adults over the age of 60; 52% of the sample was African American.	To examine the relationships among race, pain, and disability among older community dwelling older adults	Pain had a stronger association with disability in non-Hispanic White participants than in AA.

Table 7 (continued)

J.M.Jordan et al. (1997)	Cross-sectional	The sample included 1,192 AA and non-Hispanic White participants who participated in the Johnson County Osteoarthritis Project.	To examine relationships among knee OA, pain, and self-reported disability	Mild knee pain was significantly associated with difficulty performing 16 upper and lower extremity tasks, and moderate knee pain was significantly associated with difficulty performing 20 functional tasks within the sample ($p < .0001$).
M.S. Jordan et al. (1998)	Cross-sectional design that used self-report	The sample included 48 African American women with rheumatoid arthritis and 52 non-Hispanic White women with rheumatoid arthritis.	To examine ethnic differences on pain coping strategies and pain beliefs	AA women were less likely to ignore their pain ($p = .023$) than non-Hispanic White women.
McCracken, Matthews, Tang, and Cuba (2001)	Cross-sectional	Sample included 57 AA and 207 NHW seeking pain treatment.	To compare the adjustment to chronic pain between AA and non-Hispanic Whites seeking treatment for pain	AA reported higher pain scores, t (260) = 3.08, $p < .01$, in comparison with other racial/ethnic groups.
Ndao-Brumblay and Green (2005)	Retrospective observational study	The sample included 104 adult African American women with chronic pain and 1,088 adult non-Hispanic White women with chronic pain.	To examine the relationships between race, pain, disability, and distress among women with pain	AA women experienced more impairment ($b = 4.622$; $p < .005$), disability (44.1 ± 13 vs. 37.1 ± 14, $p < .005$), and psychological stress related to pain than non-Hispanic White women.

Table 7 (continued)

Parmelee et al. (2012)	Cross-sectional	The sample included older adults with OA; 94 were African American and 269 were non-Hispanic White.	To examine associations of race, sex, pain, and depression in older adults with OA	AA had greater pain, *F* (1, 359) = 3.49, *p* < .062, NHW. There were no group differences in the association of pain with disability.
Ruehlman et al. (2005)	Cross-sectional study in which telephone surveys were used	The national sample included 214 AA with chronic pain and 1,935 NHW with chronic pain.	To examine if racial/ethnic differences existed in the self-report of pain experience and pain adjustment.	In comparison with NHW with chronic pain, AA with chronic pain reported lower levels of pain control (*p* < .05), more pain-induced fear (*p* < .01), and greater belief in a medical cure (*p* < .05).
Stephenson, Dalton, Carlson, Youngblood, and Bailey (2009)	Cross-sectional descriptive study	The sample included 66 NHW, AA, Latino, and American Indians experiencing cancer pain.	To examine racial/ethnic differences in perception of cancer pain experience, barriers to treatment, and satisfaction with treatment	Among AA, 85% said they had experienced pain in the last 24 hours, in comparison with 29% of Latinos and 57% of American Indians.

Table 7 (continued)

Tan et al. (2005)	Cross-sectional study in which surveys were used	The sample included 128 AA veterans and 28 non-Hispanic White veterans.	To examine the associations between pain beliefs and coping with subjective experience of functioning	AA were less likely to believe that they had control over their pain (*p* < .0001) and had a stronger belief that others should be solicitous when they experienced pain. Beliefs in one’s personal control over pain and beliefs that one was unable to function because of pain were both significant predictors of disability in both groups.
Weiner et al. (2003)	Cross-sectional survey and examination study	The sample included 2,766 adults ages 70–79; 42% of the sample was AA.	To examine the relationships of low back pain with physical function in older adults	Lower back pain was significantly associated with self-reported difficulty with functional tasks (*p* < .05) and depression (*p* = .0001) within the sample.

Table 8: Depression, Function, Disability and Health Outcomes in African Americans (AA), non-Hispanic Whites (NHW)

Citation	Design	Sample	Objective	Findings
Baker and Whitfield (2006)	Cross-sectional	247 community dwelling community dwelling AA 50 years of age and older	To examine clinical and psychosocial predictors of function in older AA	Depressive symptoms were a significant predictor of functional limitations ($\beta = 0.18$, $p < .05$).
Brown, Bromberger, Schott, Crawford, & Matthews (2014)	Longitudinal	Sample included 146 AA women and 277 non-Hispanic White women, ages 42–52 from the from the Study of Women's Health Across the Nation (SWAN)	Examine the course of depressing over an 11 year period in both groups of women	Depression was significantly associated with more difficulty functioning at work or in doing activities of daily living among AA women ($p < .05$).
Creamer, Lethbridge-Cejku, and Hochberg (2000)	Cross- sectional community study	60 African American and non-Hispanic Whites with knee OA	To assess the relationships of clinical and psychosocial variables on function in people with knee OA	No significant relationship was found between disability and depression.
Dunlop et al. (2005)	Cross-sectional	4,922 AA, NHW, and	To evaluate the prevalence of functional	Depression increased the odds of functional

Table 8 (continued)

		Hispanics with arthritis	decline among adults with arthritis	decline across the entire sample (OR = 1.3, 95% CI: 1.1–1.6).
Gitlin et al. (2007)	Longitudinal, community-based	129 AA adults and 151 non-Hispanic Whites adults with disabilities.	To determine if control oriented strategies moderated effects of functional limitations on depressive symptoms	For AA there was a significant correlation between depressive symptoms and functional limitations at baseline ($r = .43$, $p < .001$) and 12 months ($r = .44$, $P < .001$)
Jang et al. (2008)	Cross-sectional	The sample included 1,433 participants: 504 Whites, 360 AA, 328 Cubans, and 241 non-Cuban Hispanics all 65 years of age and older living in the state of Florida.	To examine direct and indirect effects of demographic variables on depressive symptoms in a mixed-ethnic sample	Among AA depressive symptoms and function were significantly related in women ($r = .37$, $p < .001$). Depression was significant in younger AA ($r = .43$, $p < .001$), but not older AA.
Mendes de Leon and Rajan (2014)	Longitudinal over a 9-year period	Sample included 5,306 AA and non-Hispanic whites over 65 years of age. AA made up 65% ($n = 3{,}470$) of the sample.	To examine psychosocial influences on onset and progression of disability in older adults	Depressive symptoms were significantly related to onset of disability ($p < .01$) but not progression of disability within the sample.

Table 8 (continued)

Parmelee et al. (2012)	Cross-sectional	The sample included 94 AA and 269 non-Hispanic Whites with knee OA.	To examine how race and sex affected associations among pain, depression, and disability among older adults with knee OA.	Among AA women there was not a significant relationship between disability and depression.
Thorpe et al. (2011)	Cross-sectional	602 community dwelling AA men and women 48-92 years of age.	To examine relationships between demographics and health conditions with mobility limitations	AA who had more depressive symptoms had higher odds of more functional limitations (women, OR = 2.98, 95% CI: 1.55-5.7; men, OR = 3.19, 95%, CI: 1.33–7.65) than those without major depressive symptoms.

Table 9: Racial Discrimination (RD), Stress from RD and Associated Health Outcomes in African Americans (AA),

non-Hispanic Whites (NHW)

Citation	Design	Sample	Objective	Findings
Borrell et al. (2007)	Retrospective, descriptive study	The sample included 1,507 AA and 1,813 NHW.	To examine if there was an association between substance abuse and RD	AA who reported RD in 3 or more situations were more likely to have used marijuana 100 or more times in their lifetimes (OR = 3.31, 95% CI: 1.90–5.74) and reported more tobacco use (OR = 2.12, 95% CI: 1.42–3.17) than their counterparts who did not report RD.
Borrell et al. (2006)	Non-experimental correlational	A sample of 1,722 AA men and women. Data were from the longitudinal coronary artery risk development in young adults study.	To examine the associations between self-reported mental health with RD and skin color in AA	In AA women, RD was associated with higher odds of having poorer physical health ratings (–0.16, 95% CI: –0.28, –.04) and poorer mental health ratings (–0.52, 95% CI: –0.67, –.037).
Burgess et al. (2009)	Non-experimental cross-sectional	The sample included 393 African American male veterans 50–75 years of age	To examine if racial discrimination was related to bodily pain in African American men	RD was significantly associated with greater bodily pain ($\beta = -0.25$, $p < .0001$), even after controlling for socioeconomic and health-related factors.
Chae et al.	Cross-sectional	The sample included 1,216 AA	To examine	A total of 56% of the men reported

Table 9 (continued)

(2010)	secondary analysis	men	relationship of racial discrimination and cardiovascular history among AA men	experiencing RD in at least one situation. RD and internalization of negative beliefs about the AA race were both risk factors for cardiovascular disease in AA men.
Coogan et al., 2014)	Cross-sectional study based on surveys/self-report	The sample included 1,068 AA women enrolled in the Black Women's Health Study.	To examine the experiences of racism to asthma in AA women	RD over one's lifetime was associated with higher odds of asthma (2.12, 95% CI: 1.55-2.91).
Estrada-Martinez et al. (2012)	Cross-sectional study that was secondary analysis from a longitudinal study	The sample included 604 adolescent AA.	To examine the relationships of various stressors with violent behaviors and depressive symptoms in AA adolescents	Stress from racial discrimination was positively associated with violent behaviors ($p < .01$).
Guyll et al. (2001)	Cross-sectional descriptive study	The sample consisted of 363 community-dwelling AA and European women.	To examine the relationship between cardiovascular reactivity and discrimination	AA women who attributed mistreatment to RD had greater diastolic blood pressure ($p = .04$) than AA women who did not attribute mistreatment to RD.
Halanych et al. (2011)	Cross-sectional observational study that used telephone surveys	The sample consisted of 1,800 elderly AA and Europeans.	To describe the association of racial discrimination with income and education among older adults	AA men reported more RD and more intense RD than African American women ($p < .001$). Among AA, as income and years of education increased, RD increased.

Table 9 (continued)

Kwate et al. (2003)	Cross-sectional descriptive study that used self-report	The sample included 71 AA women with ages 26–72.	To examine if experiences of racist events were significantly related to negative health behaviors or health outcomes in AA women	A lifetime of racial discrimination was negatively correlated with perceived health (*p* < .05). Appraised stress from racial discrimination was not significantly related to any of the negative health behaviors or health outcomes in the AA women.
McIlvane, Baker, and Mingo (2008)	Non-experimental, cross-sectional	The sample included 75 AA and 100 non-Hispanic White women ages 45–90.	To examine the effects of arthritis related stress and chronic life stress in AA and non-Hispanic White women	Among AA women, everyday RD was significantly related to more depressive symptoms (*b* = 0.51, *p* < .01).
Pascoe and Smart Richman (2009)	Meta-analysis	134 research articles were used for the review. Studies included mixed ethnic samples as well as AA samples; sample sizes varied.	To examine relationships between multiple forms of discrimination with health behaviors and health outcomes	RD increased the odds of having poorer physical health; the average relationship under a random effects model was *r* = −.13, with a 95% CI from −.16 to −.10.
M.E. Peek et al. (2011)	Cross-sectional descriptive study that used data from the Behavioral Risk Factor	A mixed racial/ethnic sample of 2,238 who identified as AA, non-Hispanic White, Hispanic, multi-racial, or other. Participants had diabetes and were a part of the Behavioral Risk Factor	To investigate associations between self-reported healthcare discrimination and diabetes outcomes	Participants who reported RD were more than twice as likely to report diabetes-related foot problems and retinopathy than participants who did not report RD (22% vs. 11%, *p* = .02; OR = 2.32, 95% CI: 1.15–4.68) and

Table 9 (continued)

	Surveillance System (BRFS)	Surveillance System study.		retinopathy (36% vs. 20%, $p < .01$; OR = 2.26, 95% CI: 1.24–4.12).
Peters (2006)	Non-experimental descriptive correlational	The sample included 162 AA 18–80 years of age.	The objective of this study was to examine middle-range theory of stress to look at the effects that racism and emotional coping had on emotional and physical health of AA.	RD was reported by 83% ($n = 135$) of the sample. The older participants (>40 years of age) reported more stress related to RD than participants younger than 40, $t(158) = 2.38$, $p = .02$. RD was significantly associated with chronic stress emotions ($\beta = 0.15$, $p < .05$); however, RD was not significantly related to blood pressure.
Subramanyam et al. (2012)	Cross-sectional descriptive study	The sample included 5,301 AA.	To examine the relationships between subjective social status with cardiovascular risk factors, and examine if RD modifies any of the relationships	RD did not modify the association between subjective social statuses with cardiovascular risk factors.
Troxel et al. (2003)	Cross-sectional descriptive,	The sample included 334 African American women ages 42–52.	To examine the relationship between a composite index of stress and carotid disease	AA women who attributed unfair treatment to RD had slightly higher carotid plaque scores than AA women who did not report unfair treatment or attributed it to other factors besides RD (OR = 4.02, 95% CI: 0.94–17.14, $p = .06$).

Table 10: Health Care Access (HCA) and Health Outcomes in AA, non –Hispanic Whites

Citation	Design	Sample	Objective	Findings
Agrawal et al. (2012)	Cross-sectional descriptive study from the National Kidney Foundation's Kidney Early Evaluation Program	The sample included 122,502 AA and non-Hispanic White adults with chronic renal disease; there were 30,419 AA in the sample.	To examine HCA in a mixed ethnic sample of adults with chronic renal disease	Among the AA in this sample, 5% thought it extremely difficult to access health care and 13% thought it somewhat or moderately difficult to access health care. AA at all stages of renal disease were less likely to have a physician than their NHW ($p < .001$).
Aroian et al. (2007)	Cross-sectional descriptive	The sample included 103 AA and 101 NHW over 60 years of age. All participants self-reported to be low income.	To examine racial/ethnic differences in dissatisfaction with health care	AA reported more problems with accessing health care such as less geographic accessibility, F (l, 194) = 6.76, $p < .02$, and less appointment availability, F(l, 194) = 12.55, $p < .001$, than NHW; and 95% of AA did not have valid health insurance, whereas 55% of NHW did not have health insurance.

Table 10 (continued)

Becker et al. (2004)	Qualitative narrative analysis	The sample included 167 AA with one or more chronic illnesses.	To examine retrospective views surrounding the development of self-care measures	The participants who lacked health insurance/HCA reported exercising less often, but when participants did report exercising they said it was the only way they could “control the pain” or “lower their blood sugar.” Participants without HCA also told stories of borrowing prescription medications.
Bharmal and Thomas (2005)	Cross-sectional study from the 2000 Medical Expenditure Panel Survey data	The total sample of 9,396 comprised non-Hispanic Whites, AA, Hispanics, and other minorities.	To examine relationships between health insurance and overall health related quality of life	Participants without health care insurance had lower physical component scores ($\beta = –5.8$; *SE* = 0.4) and lower mental component scores ($\beta = –1.1$, *SE* = 0.4) and lower health related quality of life than participants with health care insurance.
Green et al. (2004)	Prospective cross-sectional design using survey methodology	The sample included 324 AA receiving treatment for chronic pain and 300 NHW receiving treatment for chronic pain.	To evaluate health care utilization and pain management referrals in a racial/ethnically diverse sample	Among AA, 13% reported not having a primary physician. AA were more likely to use the emergency room as a source of primary care for pain management than NHW (1.5% vs. 3.0%, $p < .01$; OR = 0.24, $p < .05$).

Table 10 (continued)

Harris (2001)	Cross-sectional descriptive study from the third National Health and Nutrition Examination Survey	The sample included 1,480 AA, non-Hispanic White, and Mexican American participants with Type II diabetes. There were 405 AA.	To evaluate health care access and outcomes in people with Type II diabetes	Among AA, 93% had health insurance. AA with health insurance were more likely to have a lower HbA1c, (OR = 3.7, CI: 1.1–12.5), and a lower albumin to creatinine ratio (OR = 2.7, CI: 1.1– 6.5) than AA without insurance. AA with hypertension who had access to 6 or more physician visits in the previous year were more likely to have a blood pressure <140/90 (OR = 1.5, CI: 1.2– 4.8) than AA with hypertension without access to 6 or more physician visits in the last year.
Kail and Taylor (in press)	Longitudinal over 12-year period	The sample included 5,755 AA and NHW 65 years of age and older.	To test if different forms of private insurance coverage mediate the onset, persistent level, or acceleration of functional limitations in Medicare recipients	AA were less likely to have marketplace insurance than NHW (8% vs. 22%), and this was a significant factor in the high rates of functional limitations in AA.

Table 10 (continued)

Rhee et al. (2005)	Cross-sectional descriptive	The sample of 605 participants was described as majority AA, with 89% of the sample comprising of AA.	To examine the relationship between socioeconomic variables and health care status with glycemic index among people with diabetes	Participants who reported difficulty with HCA had significantly higher HbA1c levels (9.4%, *p* < .001) than participants who did not have difficulty with HCA. Access to care was significantly related to HbA1c; less access led to an increase in HbA1c by an average of 0.57.
Weinick et al. (2000)	Longitudinal non-experimental	The sample consisted of 38,336 AA, non-Hispanic Whites, and Hispanics in 1977; 33,536 AA, NHW, and Hispanics in 1987; and 20,793 of the same 3 groups in 1996.	To examine the relationships between (1) health care status, demographics, and health insurance coverage and (2) health disparities in the U.S. population.	AA were more likely to lack a usual source of health care than NHW (*p* <. 01); however, even after making HCA equal in AA and NHW, 55%–77% of the health disparities still existed.

Chapter 3: METHODS

In this study the researcher examined biological risk factors (age, BMI, and waist circumference), intra-individual psychosocial factors (health care utilization, trust in health care providers, pain, pain beliefs, and depression), and cumulative extra-individual factors (racial discrimination, stress from racial discrimination, and health care access) thought to influence the disablement process in African American women 50–80 years of age with OA. Using cumulative inequality theory (Ferraro & Shippee, 2009) and the disablement process model (Verbrugge & Jette, 1994), the cause of disablement outcomes in middle-aged and older African American women with OA was hypothesized to be multifactorial.

This chapter addresses the study's research design, the target population and sample, the procedures used for data collection, the standardized instruments that were used, the statistical analysis, and the procedures for the protection of human subjects.

RESEARCH DESIGN

This study was based on a nonexperimental, descriptive, correlational research design; variables are not manipulated (Polit & Beck, 2011). Such a design is limited because it does not allow determination of causality; but it does permit large amounts of data to be collected, and it is a simple, appropriate way to explore relationships among factors (Kuzma & Bohnenblust, 2005; Polit & Beck, 2011).

STUDY PROCEDURES

Sample

Participants constituted a convenience sample, recruited throughout the states of Texas and New Mexico. Texas has a population of over 25 million people; 10% are over the age of 65, 11% are African American, and 50% are female (U.S. Census Bureau, 2010b). New Mexico's population comprises over 2 million people, of whom 14% are over the age of 65 and 3% are African American (U.S. Census Bureau, 2013). The author has been active in the African American communities in both states. The sample consisted of 120 African American women ages 50–80. Eleven of these women lived in New Mexico, and 109 in Texas. They were non-institutionalized, with a diagnosis of OA. The women all had to meet the inclusion criteria for the study that included: a permanent functional limitation, evidenced by the inability to perform specific activities; in order to participate, they were required to report 2 of 4 functional limitations as specified on the National Interview Survey (unable to stand for 20 min, bend from standing position, walk a quarter of a mile, walk 10 steps without resting; CDC, 2009), identify as African American females, be between 50-80 years of age, live in Texas or New Mexico, and report receiving health care in the United States. The exclusion criteria for this study included: non-African American (women who were from another country and/or have spent most of their life in another country were not included because the researcher examined the environment and experiences specific to the U.S.), males, ages younger than 50 or older than 80, no diagnosis of OA, and being institutionalized.

The 50 to 80 year age range was chosen to capture early life exposure to functional decline. Thorpe and colleagues (2011) have posited that researchers often fail to include African Americans under the age of 65 when examining functional outcomes, which might cause missed information about early life exposure to functional decline.

Self-report of a diagnosis of OA was used for this study. There was no literature found that examined the accuracy of self-report of a diagnosis of OA among middle-aged and older African American women. Among older women, self-report of OA (Simpson et al., 2004) and rheumatoid arthritis (Oksanen et al., 2010; Simpson et al., 2004; Star et al., 1996) has been found to be inaccurate. However, Wong and colleagues (2004) reported an 86% specificity of self-report of arthritis, and Ling and colleagues (2000) reported a 77% specificity of rheumatoid arthritis diagnosis among older women.

The participants in this study were asked whether a health care provider had diagnosed them with OA and, if so, how long ago they had received the diagnosis of OA. All of the women included reported that a health care provider told them that they had OA; 10 women were not included because they could not confirm a diagnosis of OA by a health care provider. Three of these women reported a diagnosis of rheumatoid arthritis, and 2 reported a diagnosis of osteopenia.

Sample Size Determination

To determine sample size, a multiple regression power analysis in G*Power 3.1 was used (Erdfelder, Faul, & Buchner, 1996). No previous studies resembled this one sufficiently to guide estimation of an appropriate sample size. An a priori power analysis was therefore carried out, assuming an alpha of .05, 80% power, and an effect size of .20

using a total of 10 tested predictors. Given a lack of prior research studies, it is recommended that one use small to medium effect sizes (0.20–0.70; (Hayat, 2013). The power analysis indicated use of 95 participants. A total of 176 potential participants were screened; 140 met the study's criteria. Out of the 140 participants who were then enrolled, 121 completed the study. The response rate was therefore 86%. Three participants stated that they could no longer participate due to illness/hospitalizations, and 1 participant returned an incomplete survey with a note stating that it was too long; 15 did not return their surveys after a reminder letter was sent. One participant who completed her survey and returned it wrote that she was Canadian and not American, so she believed her results might not be accurate for the study. Hence, her data were not included; the final sample was 120.

Recruitment

Participants were recruited primarily through advertisements at various locations and by word of mouth. Churches are often frequented by older African American women and are an effective location for recruitment of older African American participants (Unson et al., 2004), so participants were recruited from churches in Texas and from two churches in New Mexico, yielding 22 participants. Recruitment occurred at three health-related events at two churches in Austin, TX, and one church in Weatherford, TX. A total of six participants were recruited through the Well Med Senior Center in Austin. Participants were also recruited successfully through an African American beauty salon in Austin, through the University of Texas at Austin Black Faculty and Staff Association, and through Delta Sigma Theta Sorority in Texas and New Mexico. Advertisements were placed on websites or sent through email through these organizations, yielding 20 participants. The researcher also discussed the study on two local radio stations serving African American communities throughout Texas and New Mexico, which yielded 6 participants. A flyer was also placed at a senior high-rise in Austin, TX, which yielded 3 participants. The most successful form of recruitment occurred through participants' sharing their experience with other potential participants. Permission was obtained from all organizations before recruitment. The researcher shared a copy of the flyer with the appropriate contact person, explained the study, and answered any questions concerning the study with the appropriate contact person.

The recruitment flyer included the study's purpose, the expectations for participants, eligibility requirements, the researcher's email, local phone number, and a toll-free number to call for anyone interested in the study. Potential participants were screened for eligibility via telephone or in person. If eligibility was established, the participant's willingness to participate was obtained verbally, and a packet of information containing a written consent, a second copy of the consent form for the participant to keep, instructions for completing the study, the study survey booklet, a self-addressed stamped return envelope, and a 60-inch paper tape measure were mailed to the participant. Three participants returned the survey booklet without consents and were sent a third consent to sign and return. A copy of the consent form, and recruitment flyer are included in Appendix A. A copy of the survey booklet is included in Appendix B.

Data Collection

The University of Texas Institutional Review Board (IRB) approved this study on January 1, 2013; amendments were approved on December 18, 2013 (IRB study number

2012-11-0090; see Appendix A). Funding for this study was provided by the National Hartford Center for Gerontological Nursing Excellence 2012-2014 Patricia G. Archbold Scholarship, MayDay Scholarship, and from the National Institutes of Health (NIH) and National Institute of Nursing Research (NINR) National Research Service Award (1F31NR014399-01).

Using a mail format survey had potential benefits as well as limitations; however, the researcher took appropriate steps to minimize any limitations. The mail format survey eliminates interviewer bias, maintains participants' confidentiality, and allows participants to complete surveys within a comfortable time frame without feeling pressured by an interviewer to answer questions (Dillman, Sangster, Tarnai, & Rockwood, 1996; Polit & Beck, 2011). Mail surveys have been used successfully in older adult populations (Börkan, 2010; Dominick, Ahern, Gold, & Heller, 2004). Mail format surveys can be limited if participants have some difficulty understanding questions or forget to answer them, which did cause missing data in this study.

The recommendations of Dillman (2007) were followed in order to increase response rates: surveys were provided with well-organized visual layout and clear questions; envelopes with appropriate return postage were included in the survey packet; and personalized correspondence was used to create connections with the participants. Dillman's recommendations about how to communicate and correspond with participants were also followed. Participants were contacted as follows: first, a brief prenotice phone call was made for screening and to provide information about the study; second, if the participant qualified for the study, a survey packet was mailed; third, a follow-up letter was sent 2 weeks after the mailing of the survey packet to inquire whether a replacement survey was needed or whether the participant might have any questions regarding the process; fourth, participants were called after 2 more weeks if the survey had not yet been received. Upon receipt of surveys, gift cards were either mailed or given to participants in person. Gift cards were mailed inside a thank you card, and a log was kept with documentation of all gift card numbers. Participants were asked to call when they received gift cards via mail. If participants did not confirm receipt of gift cards, the researcher called them to confirm receipt.

Participants who successfully returned their surveys received $50.00 in the form of cash or a Wal-Mart gift card. One gift card was replaced because the participant stated that she never received it. Whenever necessary, participants were called to follow up on missing data. The women who were reached answered questions to complete their data; however, not all of the participants returned phone calls or had the same phone numbers when the researcher called to inquire about the missing data.

INSTRUMENTATION

The data collection booklet consisted of a battery of nine instruments and one demographic profile. The nine instruments included the revised Health Assessment Questionnaire Disability Index (HAQ-DI; (Fries, Spitz, Kraines, & Holman, 1980), the Craig Handicap Assessment and Reporting Technique–Short Form (CHART-SF; Whiteneck, Charlifue, Gerhart, Overholser, & Richardson, 1988), the Stanford Health Care Utilization Survey, the Trust in Providers Scale (Anderson & Dedrick, 1990), the McGill Pain Questionnaire (Melzack, 1987; Melzack & Torgerson, 1971), the short form of the Survey of Pain attitudes (SOPA; Jensen, Karoly, & Huger, 1987; Tait & Chibnall, 1997), the Center for Epidemiologic Studies Depression Scale (Radloff, 1977), the General Ethnic Discrimination Scale (Landrine, Klonoff, Corral, Fernandez, & Roesch, 2006), and the Consumer Assessment of Health Care Providers and Systems Health Care Access supplement (USDHHS, 2012). The survey booklet thus had 259 questions. Permissions to use all of the instruments were obtained for this study. Participants stated that it took 25 min to 1.5 hours to complete the survey. A summary of the reliability of the instruments reported in the literature is presented in Table 11. A summary of the reliability and instrument characteristics for this study are presented in Chapter 4, Table 14.

Table 11

Summary of Instruments

Instrument	Variable	Subscales	Number of Items	Reliability
Health Assessment Disability Index (HAQ-DI)	Function	None	20	α = .94-.95
Craig Handicap Assessment and Reporting Technique Short Form (CHART-SF)	Disability (social role performance)	1. Physical independence 2. Cognitive independence 3. Mobility 4. Occupation 5. Social integration 6. Economic self-sufficiency	20	ICC = .81-.93
Trust in Physicians Scale (TPS)	Trust in health care providers	None	11	α = .85-.90
Stanford Healthcare Utilization Survey	Health care utilization	None	4	α = .76-.97
McGill Pain Questionnaire Short Form (SF-MPQ)	Pain intensity and pain ratings	1. Affective 2. Sensory 3. Visual analogue scale 4. Present pain intensity 5.	17	α = .82
Survey of Pain Attitudes -35 (SOPA-35)	Pain beliefs	1. Pain control 2. Disability 3. Harm	35	α = .77

Table 11 (continued)

		4. Emotion 5. Solicitude 6. Medical cure		
The Center for Epidemiologic Studies for depression scale (CESD-R)	Depressive symptomology	None	20	α = .82
General Ethnic Discrimination Scale (GRE)	Racial discrimination and stress from racial discrimination	1. Recent racist events 2. Lifetime racist events	36	α = .95
GRE	Appraised stress from racial discrimination	1. Appraised racist events	17	α = .94
Consumer Assessment of Health Care Providers (CAHPS)	Health care access	1. After hours care 2. Health information technology 3. Patient-centered medical home	41	α = .74-.86

α = Cronbach alpha/reliability; ICC = interclass correlation of test–retest reliability

Demographics

To capture a demographic profile, the participants were asked to answer questions about their ethnicity, age, marital status, yearly income, insurance status growing up, current insurance status, city and state of residence, and number of years of education. The participants were also asked whether they used pain medications and which ones, whether they had a history of steroid injections, whether they had any history of joint replacements, and how long they had OA.

BMI

Although participants' self-reported weight and height can be inaccurate, for the purposes of this study, self-report of weight and height were used to measure BMI. BMI was calculated using the following formula: BMI = weight (in pounds)/[height (in inches)]^2 x 703 (CDC, 2011a). Findings in the current literature on self-report of weight and height among African American women are inconsistent. For example, researchers have reported that older African American women are likely to overestimate their height and underestimate their weight (Okosun, Bhatt, Boltri, & Ndirangu, 2008; Stommel & Schoenborn, 2009; Truesdale & Stevens, 2008). Researchers have also reported that women from various racial/ethnic groups who visited a physician in the last year and had a chronic condition such as osteoporosis were more likely to report accurate weight and height (Craig & Adams, 2009). In addition, some have reported that older age may not be significantly related to inaccurate self-reports of weight and height (Finardi, Nickel, Koller, & Bingisser, 2012). For the present study, it was anticipated that participants with mobility impairment who have received health care would be likely to have discussed their current weight with their health care providers.

Waist Circumference

In addition to BMI, waist circumference was measured. It is recommended that initial assessment of obesity should be based on measurement of waist circumference and BMI (USDHHS, 2000). Waist circumference permits a measurement of abdominal fat distribution that cannot be captured by BMI (Klein et al., 2007; USDHHS, 2000), and waist circumference has been related to poorer function in African American populations

(Colbert et al., 2013; Houston, Stevens, & Cai, 2005). A waist circumference greater than 35 inches is considered high risk (USDHHS, 2000). The participants measured and reported their waist circumference, which is considered acceptable given appropriate instructions (Klein et al., 2007). A paper tape measure with specific instructions and a picture from the International Chair on Cardiometabolic Risk (2013) were included in the survey packet so that participants could measure their waist circumference.

Function

Functional limitation was measured with the revised version of the Health Assessment Questionnaire Disability Index (HAQ-DI). The HAQ-DI was designed to assess physical function across 8 activities: dressing and grooming, arising, eating, walking, hygiene, reaching, gripping, and other activities (Fries et al., 1980). In order to score the HAQ, the total score of each activity is calculated and then divided by 8. Scores on the HAQ-DI can range from 0 to 3, with 3 indicating severe limitation. The HAQ has been reported to be a valid scale for measuring function. Fries compared HAQ-DI self-report answers on function and observed functional tasks and found correlations between self-report and observed functional task from .56 to .85 for all items. Bruce and Fries (2004) examined construct validity of the HAQ-DI in 271 people with knee and/or hip OA in relation to the Western Ontario McMaster Universities Osteoarthritis Index (WOMAC); the two scales were significantly correlated (r =. 71, p < .0001).

The HAQ-DI demonstrated strong reliability for this study; Cronbach’s alpha for the HAQ-DI was .93. Kose colleagues (2010) reported a Cronbach’s alpha of .95 for the HAQ-DI among people with knee OA. Harrison (2009b) reported a Cronbach’s alpha of

.94 for the HAQ-DI in a sample of women with polio. The HAQ-DI has been tested in mixed ethnic/racial samples that included African Americans (Bruce, Fries, & Murtagh, 2007); however, the reliability of the scale in those samples was not reported.

Disability

Disability was measured with the Craig Handicap Assessment and Reporting Technique Short Form (CHART-SF; Mellick, Walker, Brooks, & Whiteneck, 1999). The CHART-SF is a shortened version of the original CHART (Whiteneck, et al., 1988); the subscales are very similar to the original CHART (Whiteneck et al., 2004). The CHART-SF measures one's ability to fulfill social roles across various domains. This 37-item instrument includes six dimensions: physical independence, mobility, occupation, social integration, economic self-sufficiency, and cognitive independence. Each dimension has a possible subscale score of 100; the subscales are calculated individually and then compiled for a total index score. Total index scores can range from 0 to 600. A total index score of less than 450 or a score less than 75 on a subscale indicates the presence of disability (Whiteneck et al., 2004).

Researchers have reported the CHART to be a valid instrument in previous studies disability defined as social role participation. Walker, Mellick, Brooks, and Whiteneck (2003) conducted a study of 1,110 community dwelling participants with one of the following conditions: multiple sclerosis, stroke, burns, spinal cord injuries, or amputations; the CHART was a valid tool for measuring social participation in their sample. In addition, Hall, Dijkers, Whiteneck, Brooks, and Stuart Krause (1998) examined appropriate use of the CHART; as in previous studies, the CHART was found to be a valid instrument for measuring social participation and community integration.

Researchers have reported the CHART/CHART-SF to be reliable instruments for various populations. Walker and colleagues (2003) studied participants with various pathologies such as multiple sclerosis, stroke, and amputations and reported the interclass correlation (ICC) of the test–retest reliabilities of the CHART; its subscales ranged from .81 to .93. The ICC for the CHART as a whole was.93. Test–retest reliability of the CHART–SF was consistent with the original CHART. Test–retests were not done with the CHART in the present study, so ICC could not be calculated for the CHART within this sample.

The CHART and CHART-SF are reliable instruments for African Americans. Hall and colleagues (1998) examined proper use and interpretation of the CHART among 1,198 people with spinal cord injuries, including 413 African Americans. They reported a test–retest reliability of .93 for the total CHART and .80–.95 for the subscales used in this study. Meade, Lewis, Jackson, and Hess (2004) examined issues with employment and race among 5,925 African Americans and non-Hispanic Whites with spinal cord injuries; the CHART-SF had a test–retest reliability of .93 for the overall score.

Health Care Utilization

Health care utilization was measured with the Stanford Health Care Utilization Survey (HCU; Lorig et al., 1996; Ritter et al., 2001). The HCU included 4 individual items that can be used to measure health care utilization based on number of health care provider visits, emergency room visits, and overnight hospital stays. The scale can be used to measure health care utilization in the past 6 months. For the present study, HCU was measured using the number of health care provider visits in the last six months.

The HCU items have been reported to be valid for measuring health care utilization. Ritter and colleagues (2001) reported that self-reported provider visits ($p < .001$), hospital visits, and overnight stays ($p < .0001$) were significantly correlated with computerized utilization records after controlling for demographic and health variables. Lorig, Ritter, Laurent, and Plant (2008) reported that reported health care provider visits, emergency room visits, and number of days in the hospital were significantly correlated with medical record data in a sample of 200 adults with chronic conditions, which supports the validity of the HCU.

The HCU is also a reliable instrument for measuring health care utilization in diverse samples. Researchers have reported the HCU items to have strong test–retest reliabilities for the items in the HCU: number of physician visits had a reliability of .76, emergency department visits had a reliability of .94, overnight stays had a reliability of .89, and overnight stays in the hospital had a reliability of .97 (Lorig, Stewart, Ritter, Gonzalez, & Lynch, 1996). Although researchers have reported use of the HCU in people with arthritis and disability (Lorig et al., 2001; Lorig et al., 2008), the test-retest reliabilities of the items were not reported in those studies. No studies were found in which researchers used the HCU within a sample of African Americans.

Trust in Health Care Providers

Trust in providers was measured with the Trust in Physicians Scale (TPS; Anderson & Dedrick, 1990). The TPS measures three dimensions of trust in physicians:

(1) dependability of physician, (2) confidence in physician’s skill set, and (3) reliability of information between patient and physician. The TPS includes 11 items measured on a 5-point scale (1 = *strongly agree,* 5 = *strongly disagree*). The TPS has been adapted to measure trust in health care providers as opposed to just trust in physicians (Benkert, Peters, Tate, & Dinardo, 2008). Higher scores indicate more trust in health care providers. Four items on the TPS needed recoding (1,5,7, and 11). The TPS is a valid instrument for measuring trust in health care providers. Anderson and Dedrick (1990) confirmed construct validity of the TPS by examining how it correlated with other theoretical constructs. As expected, trust was correlated with constructs such as beliefs in powerful others (r = .38, p < .001), satisfaction with clinicians (r = .62, p < .001), and desire for clinicians’ control (r = .48, p < .001).

The TPS instrument had a strong reliability for the present sample, and researchers have reported a strong internal consistency of the TPS among diverse groups, including African Americans. The Cronbach’s alpha for the present sample was .84. Anderson and Dedrick (1990) conducted two studies to validate the TPS scale in mixed ethnic samples. They reported Cronbach’s alphas of .90 and .85. Benkert and colleagues (2008) examined trust in providers and associated factors in 145 African Americans; they reported a Cronbach’s alpha of .88. Finally, Gordon and colleagues (2006) examined racial differences in trust in providers between 23 African Americans with lung cancer and 80 non-Hispanic Whites with lung cancer. Cronbach’s alpha of .92 was reported for their study.

Pain

Pain was measured with the short form of the McGill Pain Questionnaire (SF-MPQ) (Melzack, 1975, 1987). The McGill Pain Questionnaire (MPQ) was created to measure pain-rating index. This index comprises two word descriptor categories: sensory, and affective. Three types of scores can be calculated: the pain rating; based on a visual analogue scale, total pain severity score; based on sum of ranked values assigned to words in the sensory and affective categories, and pain intensity; based on sum of ranked values assigned to words and a pain intensity question. The SF-MPQ correlates highly with the original MPQ (Dudgeon, Raubertas, & Rosenthal, 1993; Melzack, 1987). Each descriptor on the SF-MPQ is ranked on an intensity scale of 0 = *none,* 1 = *mild*, 2 = *moderate,* and 3 = *severe*. Pain intensity question was based on an intensity scale from 0 to 5, with 0 = *no pain* and 5 = *excruciating pain* (Melzack, 1987).

The MPQ is a valid instrument for measuring affective and sensory domains of pain. Kremer and Atkinson (1981) examined construct validity of the affective domain of the MPQ and reported that those with high affective pain scores were more likely to be depressed, (F(1, 36) = 6.77, p < .01, and anxious, F(1, 36) =15.81, p < .01), than those with lower affective scores; the expected results indicated that the affective dimension of the MPQ had strong construct validity. Byrne and colleagues (1982) reported strong convergent and discriminant validity of the sensory and affective subscales of the MPQ.

The MPQ had strong reliability in the present sample, and it has been used in diverse samples with good reliability. For the present sample, Cronbach's alpha for the total pain severity subscale was .87, for the total pain intensity subscale, .88. Green and colleagues (2003) examined the effect of race on chronic pain in 2,040 African American and non-Hispanic White adults over the age of 50 and reported an internal consistency reliability of .82 for the MPQ. Grafton, Foster, and Wright (2005) examined test–retest reliability of the SF-MPQ in 57 people with OA; the interclass correlations of the total score, sensory scores, affective scores, and pain scores were .96, .95, .88, and .89, respectively, which showed a strong test–retest reliability. Edwards, Moric, Husfeldt, Buvanendran, and Ivankovich (2005) studied ethnic differences in chronic pain experiences in 1,800 African Americans, Hispanics, and non-Hispanic Whites; the SF-MPQ had Cronbach's alphas of .84 for the affective subscale and .76 for the sensory subscale.

Pain Beliefs

Pain beliefs were measured with the 35-item version of the Survey of Pain Attitudes (SOPA-35; Jensen, Turner, & Romano, 2000). The SOPA-35 is similar to the original 57-item Survey of Pain Attitudes (SOPA; Jensen et al., 1987; Jensen, Turner, & Romano, 2000). The SOPA-35 measures pain attitudes in the following areas: pain control (belief in one’s ability to control pain), disability (belief that disability comes from pain), beliefs that pain is harmful, emotional beliefs surrounding pain, medication (belief that medications are the best treatment), solicitude (belief that it is the responsibility of others to assist those with pain), and medical cure (belief in a medical cure). Each area on the pain scale is scored on a 0–4 Likert scale, where 0 = *this is very untrue for me*, and 4 = *this is very true for me*. A total of 12 items were recoded (items 5, 6, 7, 10, 13,16, 26, 27, 29, 32, 33, and 34).

Researchers have reported that the SOPA-35 is a valid instrument for measuring pain beliefs. Jensen colleagues (2000) reported that the all associations found between the SOPA-35 and criterion measures supported strong criterion validity of the instrument. In addition, Strong, Ashton, and Chant (1992) examined construct validity of the SOPA and reported 7 significant correlations between the SOPA and other theoretical concepts, which also showed strong construct validity of the instrument.

Researchers have used the SOPA-35 in various pain studies and reported that it is reliable. Jensen and colleagues (2000) compared the psychometric properties of the short and long versions of the SOPA; Cronbach's alphas for all of the SOPA-35 subscales ranged from .70 to .80 (with the exception of the harm subscale, which had a Cronbach's alpha of .66). In addition, Jensen and colleagues (2000) reported that the SOPA-35 had a strong test–retest reliability, with all correlation coefficients for the subscale falling between .71 and .82.

Researchers have reported the SOPA to be reliable instrument when used in samples that included African Americans; however, the reliabilities of the subscales varied in the present study, with Cronbach's alphas for the SOPA subscales ranging from .35 to .71. A total SOPA score was calculated for this study. The total SOPA score had a reliability of .71 for the sample in this study. There were no studies found that used the SOPA within an African American sample and reported the reliabilities for that sample. The previous literature has reliabilities of the SOPA in mixed-ethnic samples. Vallerand, Pieper, Crawley, Nordstrom, and Dinardo (2013) explored the prevalence of pain and its relationship to functional status and depression in a mixed ethnic sample that included

278 African Americans; the SOPA had a Cronbach’s alpha of .77. A. Cano, Leong, Heller, and Lutz (2009) examined the relationships between pain catastrophizing and pain-related support in a sample of 51 African Americans and 55 non-Hispanic Whites; the SOPA had a strong inter-item reliability (Cronbach’s alpha = .74).

Depression

Depression was measured with the Center for Epidemiologic Studies Depression Scale (Eaton, Smith, Ybarra, Muntaner, & Tien, 2004; Radloff, 1977). The CES-D was originally designed to measure the symptoms on which diagnoses of clinical depression are based and to enable examination of the relationships between depression and other variables. The CES-D’s 20 items measure depression across nine domains: sadness, loss of interest, appetite, sleep, thinking/concentration, guilt, fatigue, movement, and suicidal ideations. Responses to questions are on a 4-item Likert scale ranging from *rarely or none of the time* (less than one day) to *most or all of the time* (5–7 days). CES-D scores can range from 0 to 60; higher scores indicate more depressive symptoms. Four items on the scale were recoded (items 4, 8, 12, and 16).

The CES-D has been reported to be a valid instrument for measuring depression. Radloff (1977) reported that the average CES-D score for a group of 70 Washington County psychiatric inpatients was substantially and significantly higher than the average for the general population samples. In addition, the CES-D had strong discriminant validity because it was significantly correlated with other scales that measured depression, such as the Lubin and Bradburn Negative affect scale ($r = .70$, $p < .05$), and negatively correlated with the Bradburn positive affect scale ($r = –.55$, $p < .05$).

The CES-D had strong reliability in the present study, and it has been reported to be a reliable instrument for older African Americans. The Cronbach's alpha for the CES-D in the present study was .89. Radloff (1977) first reported the CES-D's reliability to have a Cronbach's alpha of .85 in the general population and .90 for a psychiatric inpatient population. Jang and colleagues (2008), for example, examined depressive symptoms among older African Americans, Cubans, non-Cuban Hispanics, and non-Hispanic Whites and reported the CES-D to have a Cronbach's alpha of .82 for African Americans.

Recent and Cumulative Racial Discrimination

Racial discrimination and cumulative racial discrimination were measured using the General Ethnic Discrimination Scale (GED), an adaptation of the Schedule of Racist Events (Landrine et al., 2006). In the present study, specifically the recent and lifetime racist event subscales were used. Discrimination is rated on a Likert scale ranging from 1 to 6 (1 = *never* and 6 = *almost all of the time*). Scores on the general discrimination scale can range from 18 to 108, with higher scores indicating more racial discrimination over the past year.

Researchers have reported that the GED was a valid scale for measuring experiences of discrimination. Landrine and colleagues (2006) tested for construct validity by using confirmatory factor analysis to determine whether the two subscales assessed racial discrimination in various ethnic groups. All factor loadings for the two subscales were strong and significant ($p < .05$), which demonstrated that the GED was a valid instrument for measuring racial discrimination in African Americans and various other ethnic groups.

The two GED subscales demonstrated strong reliability for the present study, and researchers have reported that it is a reliable measure of racial discrimination/racial events. In the present study, the recent discrimination subscale had a Cronbach's alpha of .93, and the cumulative racial discrimination subscale had a Cronbach's alpha of .92. Researchers have reported Cronbach's alphas of .80 for the recent racial discrimination subscale and .93 for the lifetime racial discrimination subscale in African American populations (Landrine et al., 2006).

Stress from Racial Discrimination

Stress from racial discrimination was measured using the GED appraised racist events subscale. This subscale can be used to measure the appraisal of those events as stressful (Landrine & Klonoff, 1996). Stressfulness is measured on a Likert scale ranging from 1 to 6, with 1 = *not at all stressful* and 6 = *extremely stressful*. For each question on racial events on the GED, there is also a question asking "how stressful was this for you?" The appraised stress from racial discrimination subscale scores can range from 17 to 102.

The GED has been reported to be a valid scale for measuring appraised stress from experiences of discrimination. Landrine and colleagues (2006) tested for construct validity by using confirmatory factor analysis to determine whether the subscale assessed appraised stress from racial discrimination in various ethnic groups. All factor loadings for the two subscales were strong and significant ($p < .05$), which demonstrated that the GED was a valid instrument to measure racial discrimination in African Americans and various other ethnic groups.

The GED demonstrated strong reliability in this study, and overall it has been reported as valid and reliable for measuring appraised stress from racial discrimination in African Americans. In the present study, Cronbach's alpha for the appraised stress subscale from the GED was .94. A Cronbach's alpha of .72 in an African American sample has previously been reported (Landrine et al., 2006)

Health Care Access

Health care access was measured using the questions from the Consumer Assessment of Health Care Providers and Systems (CAHPS; USDHHS, 2012), specifically the Health Care Access Supplement Adult Survey 2.0. The CAHPS is a collection of surveys designed to evaluate patients' and consumers' experiences of the health care system (USDHHS, 2012); it is intended for people with different forms of insurance coverage, as well as groups with chronic conditions and disabilities (American College of Surgeons, 2012). The health care access supplement on the CAHPS measures patients' experiences with health care access as well as health information technology and patient-centered care. The total health care access scores ranged from 0-25.

The CAHPS has been reported to be valid tool for measuring health care access. Zaslavsky, Beaulieu, Landon, and Cleary (2000) studied 89,419 Medicare beneficiaries to investigate the relationships between member ratings and CAHPS reports. They found that CAHPS was a valid tool for measuring health care access in a mixed-ethnic/racial group.

The CAHPS health care access/getting needed care supplement was reported to be a reliable instrument in mixed ethnic/racial populations. Fongwa, Cunningham, Weech-Maldonado, Gutierrez, and Hays (2006) examined the missing data and reliability of health care evaluation instruments among 8,791 African Americans and 101,889 non-Hispanic Whites and reported a Cronbach's alpha of .91 for the African Americans sample on the CAHPS getting needed care scale. The Cronbach’s alpha for the present study was .72.

STASTISTICAL ANALYSIS

Once all the data for this study was collected, the data were entered into the Statistical Package for the Social Sciences (SPSS) 22 (IBM, 2013). The data were stored and data analysis conducted on an encrypted password-protected computer. Descriptive statistics (means, standard deviations, and frequencies) were used to describe the sample. The level of statistical significance set for all research questions was $p < .05$. Correlation, linear regression, multiple regression, and hierarchical regression analyses were considered appropriate statistical methods, because the goal was to understand relationships as well as significant predictors and moderator and mediator effects (Bennett, 2000; & Fidel, 2013).

Screening Data

To ensure accuracy of the data, the data were screened before analysis. The data screening steps included inspecting and cleaning the data, evaluating and assessing for missing data, checking for violations of assumptions (nonlinearity, heteroscedasticity, etc.), identifying and dealing with non-normal variables, and identifying and dealing with any multivariate outliers (Tabachnick & Fidell, 2013). A brief explanation of these procedures follows.

Cleaning Data

Tabachnick and Fidell (2013) recommend proofreading the original data against the computerized data file in the data window. Surveys were visually inspected for missing data, and participants were called in an attempt to complete any missing data. After the data were entered into SPSS 22.0, hard copies of the survey booklets were checked against data files. A total of 25% (n=30) of the surveys were randomly selected and the researchers checked these surveys against the data files.

Missing Data

The next step in screening the data was to evaluate the amount of missing data. In a dataset, it is desirable to have as few missing values as possible (R.Warner , 2013). Missing data affects statistical power for hypothesis testing and precision of estimation (Rubin, Witkiewitz, Andre, & Reilly, 2007). For surveys, missing data can be problematic and influence statistical models. The data were assessed to determine whether less than or more than 5% were missing; less than 5% indicates that means and models will be solid and reliable. Missing value imputations were evaluated as recommended by Tabachnick and Fidell (2013) and R. Warner (2013). The missing data analysis showed that only the CHART variable had more than 5% of the data missing. The CHART had 17% of data missing. To address this issue, missing value imputations were performed for that variable. Average unstandardized *b* values, *t* values, and significance levels were calculated from the five missing value imputations.

Outliers

Next, the data were examined for outliers. An outlier is “a score that is extreme or unusual relative to the sample distribution” (R. Warner, 2013, p. 1105) and can bias statistics such as the mean (Field, 2011). To find outliers, boxplots and Mahalanobis distances were examined. Mahalanobis distance is a measure of the distance of cases from the means of predictor variables (Field, 2011). According to the corresponding chi – square values each case needed to be less than 22.36. Three cases were higher than this; therefore, outliers were addressed by transforming applicable variables. Field (2011) recommends the following options: transforming the data, changing the score (if transformation fails), or removing the scores. Transformation proved to be successful in addressing outliers. The variables that were transformed were health care utilization, depression, recent racial discrimination, and health care access. After transformations all variables were normally distributed. Cook’s distance was also observed in this study. Cook’s distance is a measure of the overall influence of a case on a model (Field, 2011), and Cook’s distances higher than 1 are indicative of outliers (Tabachnik & Fidel, 2013). The Cook’s distance values in the analyses all fell below 1.

Multicollinearity

The last step in data screening was to assess for multicollinearity, which occurs when two variables are highly correlated with one another (greater than and equal to .90) (Tabachnick & Fidell, 2013). Multicollinearity can be problematic because it can weaken analyses in some cases, as well as cause matrix inversion (Tabachnick & Fidell, 2013). Several options are recommended for dealing with multicollinearity. One option is to delete the variable with the highest variance proportion (Tabachnick & Fidell, 2013; R.

Warner, 2013). Tabachnick and Fidell (2013) also recommend three other options: summing or averaging the collinear variables, computing principal components, or centering one or more of the variables if multicollinearity is caused by interactions of continuous variables. Field (2011) posits that one way of identifying multicollinearity is to scan the correlation matrix for correlations above .80. In addition, the variance inflation factor (VIF) is indicative of linear relationships between predictor variables. VIF values ranging from 4 to 10 or tolerance levels ranging from .10 to .25 indicate multicollinearity (O'brien, 2007); VIF values close to 1 are desirable (Field, 2011).

Multicollinearity was checked by examining correlations and the variance inflation scores in each model. Multicollinearity was detected between total pain severity and total pain intensity ($r = .99$). Hence, only one of these variables was placed in the regression models. Once regression models were run, VIF values were all close to 1, and tolerance levels were larger than .25.

Violation of Assumptions

The next step in the data screening was to test for violation of assumptions. The assumptions of multiple regressions include normality, linearity, and homogeneity of variance (Tabachnick & Fidell, 2013; R. Warner, 2013). Tabachnick and Fidell (2013) recommend using residual scatterplots to test the normality, linearity, and homoscedasticity assumptions. The assumption of normality occurs when errors of prediction are normally and equally distributed around each predicted dependent variable score; when the normality assumption is met, scatterplot residuals are piled at the center of the plot at each value of the predicted score, with normal distribution of residuals leading off the center symmetrically (Tabachnick & Fidell, 2013). Normality was examined by looking for skewness or kurtosis in the data. Skewness and kurtosis were specifically assessed using frequencies and histograms. Skewed data can be transformed based on the level of skewness; Tabachnick and Fidell (2013) recommend using square root transformation for moderate skewness, a log transformation for substantial skewness, and an inverse transformation for severe skewness.

Non-normality was detected, so the variables were transformed. Severe positive skewness was detected with the HCU item. The HCU scores were transformed by multiplying each score by 10 and then taking the log, due to severe positive skewness. After transformation, the skewness was .91 and kurtosis was 2.60. Positive skewness was also observed with depression scores, the square roots of depression scores were taken; the new skewness value was –.82, and kurtosis was 1.68. Positive skewness was also observed for the EOD recent racial discrimination scores. The recent racial discrimination subscale scores were transformed by multiplying each score by 10 and then taking the log. After transformation the skewness value for recent racial discrimination was .46 and kurtosis values were -.28. Finally, non-normality was detected with the health care access subscale on the CAHPS survey. The transformations for the health care access subscale were completed by multiplying each score by 10 and then taking the log. The new skewness value was –. 13; kurtosis was –.99. After these transformations, all the instruments showed normality.

The next step was to test for the assumption of linearity and the assumption of homogeneity of variance. The assumption of linearity occurs when a linear relationship exists between the predicted dependent variable scores and errors of prediction; the scatterplot would be rectangular when the linearity assumption is met (Tabachnick & Fidell, 2013). Linearity can be assessed by inspection of a bivariate scatterplot. If there are several nonlinear relationships among variables, they are ignored. The assumption of homogeneity of variance means the variance of one variable should remain consistent at levels of another variable (Field, 2011). If this assumption is violated, transformation of the data can be done (Field, 2011; Tabachnick & Fidell, 2013). The scatterplots were all rectangular. The assumptions of linearity and homogeneity were not violated.

Independence of errors was also tested through residual analyses. The independence of errors assumption holds that errors of prediction are independent of one another (Tabachnick & Fidell, 2013). This assumption was tested by using the Durbin Watson statistic to measure autocorrelation of errors over the sequence of cases; if the correlation is significant, errors are non-independent. A Durbin Watson value of less than one or greater than three is often indicative of a correlation between residual terms (Field, 2011). The assumption of independence of errors was met for all regression models; all Durbin Watson values fell between one and three.

Research Questions

Correlations analyses were conducted to answer the following research questions among African American women with OA 50–80 years of age:

Question 1. What are the relationships between age, BMI, waist circumference, pain, pain beliefs, health care access, trust in health care providers, health care utilization, cumulative racial discrimination, depression, and function?

Question 2. What are the relationships between age, racial discrimination, cumulative racial discrimination, stress from discrimination, pain, pain beliefs, depression, function, and disability?

Pearson's correlations were used to answer Questions 1 and 2. Pearson's *r*, a parametric statistic, measures the direction and strength of the relationship between two quantitative variables (R.Warner, 2013); the associated *p* value provides the probability of obtaining a result equal to or greater than the actual result obtained (Field, 2011; R.Warner, 2013).

Question 3. Which are the significant predictors of function among age, BMI, waist circumference, pain, and depression?

Question 4. Which are the significant predictors of disability among pain, pain beliefs, depression, and stress from racial discrimination?

Multiple regression analysis was used to answer Questions 3 and 4. Multiple regression is appropriate when more than two predictor variables are used to predict one dependent variable (R. Warner, 2013). In addition, multiple regression was used to determine which of the independent variables might predict function. The equation for multiple regression with more than two predictor variables is as follows:

$$Y' = b_0 + b_1 X_1 + b_2 X_2 + \dots b_k X_k,$$

where b_1 represents the predicted change in Y (the dependent variable) for a one-unit increase in X (the predictor variables; Tabachnick & Fidell, 2013; R. Warner, 2013). The following model was used to assess Question 3:

$$\text{Function} = b_1 \text{ (BMI)} + b_3 \text{ (pain)} + b_4 \text{ (depression)}.$$

In addition, the following model was used to assess Question 4:

$$\text{Disability} = b_1 \text{ (pain)} + b_2 \text{ (pain beliefs)} + b_3 \text{ (depression)}.$$

Only independent variables that were significantly related to the outcome variables were included in the models. Both models were assessed with adjusted R^2, the F ratio, β and t values, and the p value. R^2 indicates how much variability in function is accounted for by age, BMI, waist circumference, pain, and depression. The F ratio tests significance for the overall fit of the model (Field, 2011). If the models are a good fit, the improvement in prediction due to the model will be large; it is desirable to have an F ratio greater than 1. β represents the number of standard deviations in the change of an outcome that results from one standard deviation in change of the predictor (Field, 2011). The t statistic indicates the slope of the regression line; a t value of 2.0 or higher is desirable. The probability (p) was used to determine whether each independent variable in the regression equations was a statistically significant predictor; significance was set at $p < .05$.

Question 5: Which are the significant predictors of function among pain, pain beliefs, and depression when controlling for biological risk factors (age, BMI, and waist circumference)?

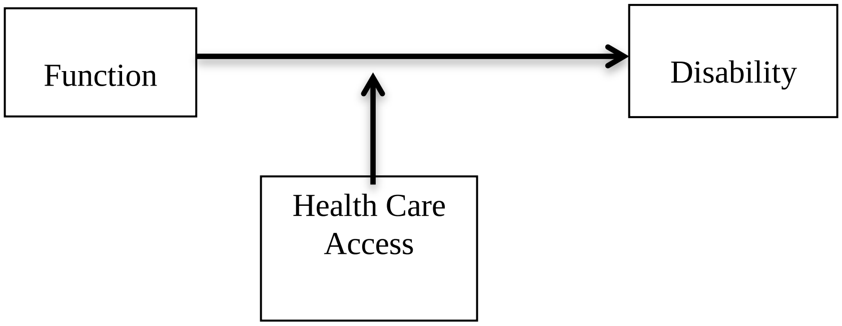
Only variables significantly related to function were included in these regression models. In a hierarchical regression, BMI was entered as the biological risk factor in the first block; the intra-individual factors (pain, pain beliefs, and depression) were entered into the second block. In this way, one can examine how much the intra-individual factors add to the prediction of function over and above the biological risk factors.

The models were assessed by examining adjusted R^2, R^2 change, *F*, unstandardized and standardized *β*, unstandardized *B*, and *t* and *p* values. The adjusted R^2 indicated how much variability in function was accounted for by the predictors. Change in R^2 shows how much of the proportion of variability is accounted for when an additional set of predictors (pain, pain beliefs, and depression) is added into the equation. Here, change in R^2 determined how much variance the predictors pain, pain beliefs, and depression added to the variance in function.

Question 6. Does health care access moderate the relationship between function and disability?

Health care access is an environmental factor that may uniquely shape the disability experience of African Americans (Copeland, 2005). It was theorized that health care access moderated the relationship between function and disability. A moderator variable can be defined as a variable that influences the direction and strength between an independent variable and a dependent variable (Baron & Kenny, 1986). Lack of health care access might lead to less access to treatment and resources to help with functional limitations; if the women do not have necessary health care to help functional limitations, they may retreat from social roles (i.e., they will experience disability). The hypothesized relationships of this model are presented in Figure 3.

Figure 3



In order to test for moderation there would need to be a significant relationship between health care access and disability (R.Warner, 2013). Health care access was not significantly related to function or disability; therefore, a simple linear regression was used to test the relationship between function and disability.

Question 7: Does health care access mediate the relationship between trust in health care providers and function?

Question 8: Does stress from racial discrimination mediate the relationship between racial discrimination and disability?

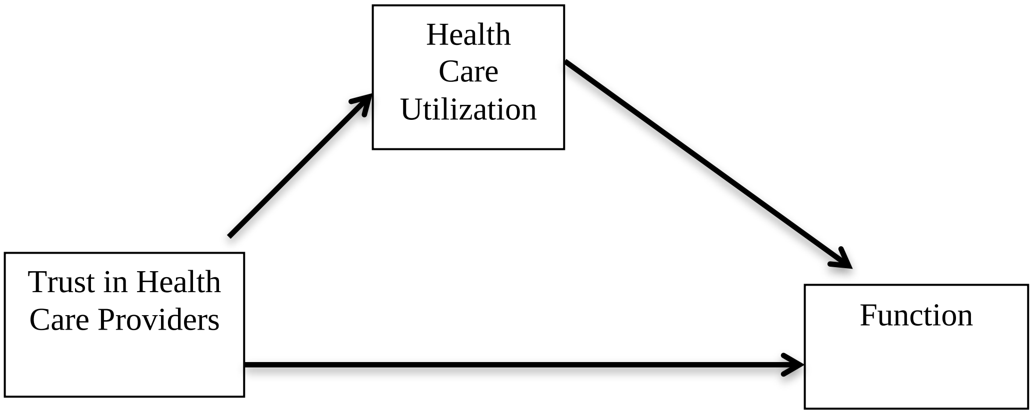
Question 9: Does depression mediate the relationship between racial discrimination and disability?

A series of regression models were used to test for mediation. Specific steps were followed to test for mediation in Questions 7 -9. A mediator is a variable that accounts for the relationship between the predictor variable and outcome variable (Baron & Kenny, 1986). According to Baron and Kenny, a mediator must meet the following criteria: variations in the predictor variable account for variations in the mediator variable (path a); variations in the mediator significantly account for variations in the dependent variable (path b); and when paths a and b no longer exist, there is no longer a relationship between the predictor and dependent variable (path c).

A series of regression models allows one to understand relationships as well as significant predictors and mediation effects (Judd & Kenny, 1981). When conducting multiple regressions for a mediation model, two assumptions must be met: there must be no measurement error in the mediator, and the dependent variable cannot have caused the mediator variable (Baron & Kenny, 1986). If these assumptions are met then a Sobel test (1982) is done to test the indirect effects of the independent variable on the dependent variable via the mediator variable (Baron & Kenny, 1986); which provides a "direct test of an indirect effect" (Preacher & Hayes, 2004, p. 718). When conducting mediation, the Sobel test compares the strength of the indirect effects of X on Y to the point null hypothesis, which is equal to zero.

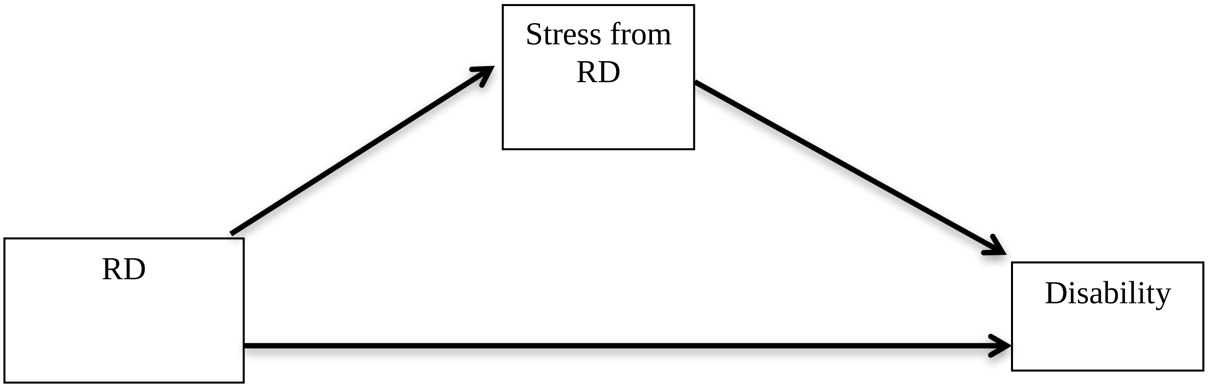
It was theorized in Question 7 that health care utilization mediates the relationship between trust in health care providers and function; these relationships are presented in Figure 4. An important pathway to better function runs through rehabilitative care (Lysack et al., 2001). If African Americans are not utilizing rehabilitative health services, they may have poorer function. One reason why African Americans may not utilize health care or rehabilitative care may be that they lack trust in health care providers (Greiner et al., 2005), which may indirectly affect function outcomes in the women.

Figure 4



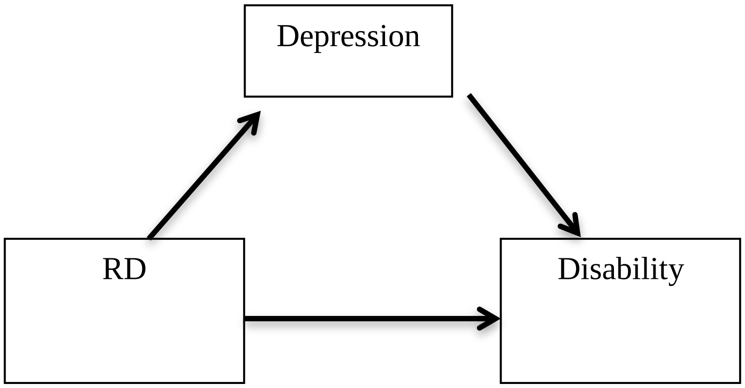
It was theorized in Question 8 that stress from racial discrimination mediates the relationship between cumulative racial discrimination and disability; these hypothesized relationships are presented in Figure 5. If the women in present study perceived racial discrimination to be stressful, they may have retreated from social roles (experience disability). The women may have experienced racial discrimination while trying to access resources, obtain health care, or in other situations throughout their lifetimes. This stress experienced from racial discrimination (RD) may have prohibited them from fulfilling their specified roles within society.

Figure 5



It was theorized in Question 9 that depression mediates the relationship between racial discrimination and disability; these relationships are presented in Figure 6. Racial discrimination can affect mental health outcomes in African Americans (Williams, Kerber, Mulrow, Medina, & Aguilar, 1995). Reseracher have reported that depression is a significant predictor of disability (Creamer et al., 2000; Parmelee et al., 2012). It was hypothesized that because of the depressive symptoms associated with racial discrimination the women had more disability.

Figure 6



The following steps were taken to test mediation for question 7 and repeated for questions 8 and 9: First it was ensured that specific conditions were met before carrying out analysis. According to Barry and Kenny (1986) and Miles and Shevlin (2001), to establish mediation, four specific conditions must be met, where *X* is the outcome variable; *Y*, the dependent variable; and *M*, the mediator variable.

1. *X* must significantly predict the dependent variable *Y*. It must be shown that trust in health care providers is a significant predictor of function, using regression. A regression with trust in health care providers as the predictor and function as the dependent variable was completed. In addition, a regression with racial discrimination as the predictor and disability as the dependent variable was completed.

2. *X* must have a significant effect on *M*. Trust in health care providers must significantly predict health care utilization. A regression analysis was therefore completed with trust in health care providers as the predictor variable and health care utilization as the independent variable. In addition, a regression analysis with racial discrimination and stress from racial discrimination was completed.

3.It must be shown that *M* significantly predicts *Y* when controlling for *X*. To test for this condition, a regression analysis was completed with health care utilization in the first block and trust in health care providers in the second block as the predictor variables and function as the outcome variable

4.Neither of the regression models from Question 7 or 8 met the requirements for mediation; hence, the next step of performing a Sobel test was not necessary. The requirements for mediation were met in question 9 and a Sobel test was completed.

PROTECTION OF HUMAN SUBJECTS

The Internal Review Board of the University of Texas at Austin approved the consent form, survey booklet, and all documents and procedures involved in the study. Protection of participants was strictly followed. The researcher completed protection of human subjects training at the University of Texas at Austin, and there were no foreseeable physical risks for participants. The targeted population was not identified as vulnerable (e.g., pregnant women, children, prisoners, or institutionalized individuals). No invasive procedures were included, and the data obtained did not expose the participants to any social or legal risks.

When recruiting potential participants via phone, the researcher explained the study and screened the callers for eligibility. Potential participants who did not meet inclusion criteria were excluded. After verbal consent was obtained, a packet of information containing a written consent, a second copy of the consent form for the participant to keep, instructions for completing the study, the survey booklet, and a self-addressed stamped return envelope was mailed to the participant or handed to the participant in person. (See Appendix A for a copy of the consent form.) Participants were reminded that they did not have to answer any questions on the instruments with which they felt uncomfortable and that they could cease participating at any time. Codes were assigned to each participant, which were placed on their respective survey booklets. The master list linking names to code numbers assigned to participants was kept in a locked secure place separate from completed surveys. All data from the questionnaires were entered into SPSS and stored on a password-protected computer encrypted by the University of Texas at Austin Technology department. All envelopes with addresses were shredded. All demographic information obtained over the phone was kept in a locked file cabinet separate from any received questionnaires.

There were no direct benefits to the participants from taking part in this study. The collection of surveys provided insight into predictors of functional limitations and disability in middle-aged and older African American women with OA, which might lead to better outcomes. Participants might benefit from knowing they were helping with knowledge development. All participants received either $50 cash or a gift card for their time.

SUMMARY

In summary, this chapter included the methodology and methods that were used for the present study. The study followed a non-experimental, descriptive correlational research design, which provided a simple way to explore relationships. The sample size, study procedures including sampling procedures and data collection procedures were described in this chapter. A description of the instruments and data analyses was also included. Correlations, multiple regressions, and hierarchical regressions were used to answer the research questions. Given the research questions, these tests were appropriate (Bennett, 2000; Tabachnick & Fidell, 2013; R.Warner, 2013). Protection of human subjects was maintained throughout the course of the study.

Chapter 4: Findings

The purpose of this cross-sectional descriptive correlational study was to examine whether biological risk factors, intra-individual psychosocial factors, and/or cumulative extra-individual environmental factors influence the disablement process in African American women 50–80 years of age with OA. Descriptive statistics, correlations, multiple regression models, and hierarchical regression models were conducted on SPSS 22.0 for these analyses; the results of the data analyses are reported in this chapter. First, a description of the sample derived from frequencies, means, percentages, and ranges of scores will be reported. The description will include demographic characteristics, socioeconomic characteristics, family characteristics, characteristics of medical care, and characteristics of medical treatments. Second, a description of the study variables will be provided, giving ranges of scores, any necessary transformation of scores, and Cronbach alpha levels when applicable. Third, findings will be reported for each of the research questions. Pearson correlations were used to answer Questions 1 and 2. Regression analyses were used to answer Questions 3 and 4. Hierarchical regression was used to answer Questions 5–9. Finally, findings will be summarized.

Sample Description

This study examined a convenience sample of 120 African American women ages 50–80 years and diagnosed with OA who lived in Texas or New Mexico; the women reported an inability to do 2 of 4 functional limitations listed on the National Interview Survey (CDC 2009). A total of 176 people expressed interest in the study; 36 of those interested did not meet the inclusion criteria. Of those who did not meet the inclusion criteria, 2 reported having rheumatoid arthritis rather than OA, and 2 reported having osteopenia, not OA. The remaining 140 were screened over the phone or in person and enrolled in the study. A total of 120 surveys were returned and included in this study.

Sample Characteristics

Demographic Characteristics

Demographic characteristics of the sample are summarized in Table 12. Nine percent of participants (*n* = 11) were from New Mexico; 91% (*n* = 109) were from Texas. The most common reported city of residence was Austin, representing 43% (*n* = 52); the next two most frequently reported cities of residence were Weatherford, TX, and Albuquerque, NM (7 participants came from each of these two cities, or 6% from each). The only other city in New Mexico reported was Rio Rancho (*n* = 4). Thirty-three participants came from various other cities in Texas (e.g., El Paso, *n* = 1; Houston, *n* = 4; Dallas, *n* = 3; Killeen, *n* = 4; Farwell, n=1; and Waco, *n* = 2).

Age

The mean age for this sample was 63.04 (SD= 8.57). A total of 62% (n=74) of the sample was middle-aged (50-65) and 38% (n-46) was older (66-80). On average, middle-aged participants experienced more pain severity (*M*=8.43, *SE*= 5.97) than older women (*M*=5.78, *SE*=6.36). The difference between middle-aged and older women's pain severity was significant(*t*(118)=2.31, *p*<.05). The middle-aged women also had more depressive symptoms (*M*=1.17, *SE*=. 03) than older women (*M*=1.05, *SE*=.04).The difference between middle-aged and older women's depressive symptoms was significant (*t*(117)=2.36, *p*<.05). There was not a significant difference in education, disability, or function between middle-aged and older women.

Socioeconomic Characteristics

Sixty-three percent of the participants (*n* = 76) were unemployed; 20% (*n* = 24) worked less than 40 hours a week; and 17% (*n* = 20) worked 40 hours a week or more. Twenty-two percent (*n* = 27) of the women made less than $10,000/year; 11% (*n* = 14), $25,001–$35,000/year; and 5% (*n* = 6), over $75,000/year. The average number of years of education was 14 (*SD* = 2.9). An economic sufficiency score was calculated from the CHART instrument, which indicated the women's ability to sustain customary socioeconomic activity and independence. A score of 100 indicated no difficulty in ability to sustain customary socioeconomic activity and independence, and lower scores indicated more difficulty. Forty-one percent (*n* = 49) of the women scored 100 on the economic sufficiency scale; 11% (*n* = 14) scored 50; and 12% (*n* = 15) scored 0.

Family Characteristics

Thirty-six percent (*n* = 43) of the women reported being divorced; the mean number of years divorced was 8.48 (*SD* = 12.78). The mean number of years married was 8.55 (*SD* = 14.87), and the mean number of years widowed was 2.96 (*SD* = 7.44). Of those who were not married, 10% (*n* = 12) were involved in a romantic relationship. Although 35% (*n* = 41) of the women had children living in the home, 65% (*n* = 79) did not. Family sizes comprised the participant, the number of relatives, and/or the spouse currently living in the home. Fifty percent (*n* = 60) of the women had a family size of one; 23% (*n* = 27), a family size of two; 12% (*n* = 15), a family size of three; 7% (*n* = 8), a family size of 4; 4% (*n* = 5), a family size of five; and 4% (*n* = 5), a family size of six.

Insurance and Health Care Characteristics

Thirty-three percent of the women (*n* = 40) had no health insurance while growing up; 70% (*n* = 83) had health insurance through private pay from employers during the ages of 21–49. Ninety-six percent (n=115) had some form of health insurance currently. The most common current form of insurance was Medicare, accounting for 24% of the sample (*n* = 29); the second most common form of current health insurance was private pay through an employer, accounting for 23% (*n* = 28). The number of physician visits during the last 6 months ranged from 0 to 24. Eighty-eight percent of the women (*n* = 106) had less than six visits to a physician during the last year. The number of visits to an ER during the last 6 months ranged from 0 to 20, with 68% (*n* = 81) of the women not visiting an ER. The number of nights staying in the hospital after being admitted in the last 6 months ranged from 0 to 47; 87% (*n* = 104) did not have any overnight stays in the hospital during the last 6 months. The average number of years with osteoarthritis was 11.33 (SD= 10.46). The range of years with osteoarthritis in this sample was 6 months to 64 years. The number of years with osteoarthritis was not significantly related to disability, pain, or function in this sample.

Table 12. Sample Characteristics

	Mean	*SD*	Frequency	Percentage
Age	63.04	8.57		
Yearly Income				
Less than 10,000			27	23%
10,001-15,000			22	18%
15,001-20,000			5	4%
20,001-25,000			12	10%
25,001-35,000			14	12%
35,001-50,000			14	12%
50,001-75,000			17	14%
Greater than 75,000			6	5%
Missing			3	2%
Employment				
Employed			45	38%
Not Employed			75	62%
Education in years	14	2.9		
Marital Status				
Married			36	30%
Divorced			43	36%
Widowed			27	23%
Never Married			11	9%
Missing			3	2%
Children in home			41	35%

Medical Treatments

In Table 13, a profile of OA and associated treatments is presented. Eight percent of the sample (*n* = 10) were currently not taking any medications for pain. The medications used for pain were nonsteroidal anti-inflammatories (e.g., ibuprofen; 23%, *n* = 28), prescribed narcotics (e.g., hydrocodone; 16%, *n* = 19), over-the-counter analgesics (e.g., acetaminophen; 13%, *n* = 16), and prescribed non-narcotics (e.g., meloxicam; 6%, *n* = 7). The remainder of the sample were taking some combination of these medications.

Table 13. Osteoarthritis and Related Treatments

	Mean	*SD*	Frequency	Percentage
Number of years with OA	11.33	10.46		
Had cortisone injections			74	61%
Had hylagen injections			24	20%
Had joint replacement			25	21%
Currently taking pain medications			110	92%

Fifty-eight percent (*n* = 43) of the 74 women who had cortisone injections had received them in their knees. Of the 24 women who had lubricant injections (e.g. hylagen injections), 92% (*n* = 22) had them in their knees. Twenty-one percent (*n* = 25) of the sample had joint replacements. Of those, nine had replacements in multiple joints. Ninety-nine percent (*n* = 24) of the women with joint replacements had at least one knee replacement.

Table 14. Characteristics of Study Variables

Variable	Sample Number	Range	Mean	Standard Deviation	Skewness	Kurtosis	α
BMI	120	19.74-57.40	35.27	77.45	.48	.17	
Waist circumference	120	28-66	43.03	6.78	.52	.45	
Function	120	0-2.88	1.33	.58	.22	-.03	.93
Disability	100	224.2-574.6	420.16	90.91	-.35	-.92	
Trust in health care providers	120	14-54	40.04	7.20	-.91	1.72	.84
Health care utilization	112	0-2.49	.67	.41	.91	2.60	
Pain severity	120	0-26	7.42	6.22	.793	.13	.87
Pain intensity	120	0-30	9.59	7.22	.83	.12	.88
Total pain beliefs	116	.97-3.30	2.11	.46	-.19	-.08	.71
Depression	119	0-1.73	1.13	.285	-.82	1.68	.89
Recent racial discrimination	120	1.26-1.98	1.51	.17	.46	-.28	.93
Cumulative racial discrimination	120	18-96	48.04	16.70	.60	.06	.92
Appraised stress from racial discrimination	120	17-99	48.87	20.49	.48	-.49	.94
Health care access	120	0-1.4	.65	.40	-.13	-.99	.72

DESCRIPTIVE STATISTICS FOR MAJOR STUDY VARIABLES

In Table 14, the sample number, mean, standard deviation, skewness and kurtosis of BMI, waist circumference, function, disability, trust in health care providers, health care utilization, total pain severity, pain intensity, pain beliefs, depression, racial discrimination within the last year, cumulative racial discrimination, appraised stress from racial discrimination, and health care access are presented. Cronbach's alphas for the relevant instruments are also reported.

Characteristics of Study Variables

The variables in this study were examined for means, standard deviations, ranges, Cronbach's alphas if applicable, normal distribution, and outliers. Normal distribution was assessed by observing the histogram of each variable, as well as skewness and kurtosis. To assess for outliers, boxplots were observed, and Mahalanobis distance was run on SPSS.

Weight

BMI scores ranged from 19.74 to 57.40. Five percent (*n* = 6) of the women reported weight/height ratios that placed them within a normal BMI category (18.5–24.9); 17% (*n* = 20) were obese (BMI 25–29.9); 78% (*n* = 94) were severely obese (BMI 30 and above; CDC, 2011). The waist circumferences ranged from 28 to 66 inches. In women, a waist circumference of greater than 35 inches indicates abdominal obesity (Grundy, 2005); 89% of the women (*n* = 107) had a waist circumference greater than 35 inches. The range in waist to hip ratios was .67–1.53; in women, a waist to hip ratio greater than .85 indicates abdominal obesity (WHO, 1999).

Disablement

Function was measured using the HAQ-DI; total HAQ-DI scores range from 0 to 3, with higher scores indicating poorer function. For this sample, function scores on the HAQ-DI ranged from 0 to 2.88. The sample was normally distributed across function, with the majority of the sample falling in the middle of the scale. Cronbach's alpha for the HAQ-DI for this sample was .93. There were women who reported no functional limitations as well as women who had severe functional limitations. Disability was measured using the CHART-SF; total CHART-SF scores can range from 0 to 600, with higher scores indicating less disability. For this sample, disability scores on the CHART-SF ranged from 224.2 to 574.6. The sample was normally distributed for the disability variable; however, this variable was missing about 17% (*n* = 20) of the data. Participants may not have understood the wording of the questions or may simply have left questions blank if the questions did not apply to them. Missing value imputations were calculated for the CHART-SF variable. In this sample there were no scores of 600, so none of the women had complete absence of disability.

Trust in Health Care Providers

Trust in health care providers was measured using the Trust in Physicians Scale (TPS); scores can range from 0 to 55, with higher scores indicating more trust in health care providers. For this sample, the scores on the TPS scale ranged from 14 to 54. The most frequent score reported was 40, accounting for 8% (*n* = 10) of the sample. The TPS scores for this sample were normally distributed. Cronbach's alpha for the TPS for this sample was .84. Within this sample there were women who did have high trust; none of the women had no trust in health care providers.

Health Care Utilization

Health care utilization was measured with the Stanford Healthcare Utilization Survey. The item used was the number of visits to a provider during the last six months. Due to severe positive skewness, the scores were transformed by multiplying each score by 10 and then taking the log. For this sample, the health care utilization scores before transformation ranged from 0 to 24; after log transformation, they ranged from 0 to 2.49. The scores were normally distributed following transformation. Cronbach's alpha for the

The items from the health care utilization scale included a total score of physician visits, ER visits, and hospital stays. For this sample, the number of physician visits during the last 6 months ranged from 0 to 24. Eighty-eight percent (*n* = 106) of the women had less than six visits to a physician in the last year. The number of visits to an ER during the last 6 months ranged from 0 to 20, with 68% (*n* = 81) not visiting an ER. The number of nights staying in the hospital after being admitted in the last 6 months ranged from 0 to 47, and 87% (*n* = 104) of the women did not have any overnight stays in the hospital during the last 6 months.

Pain and Pain Beliefs

Pain severity and pain intensity were measured with the Short Form McGill Pain Questionnaire (SF-MPQ); the scores for pain severity can range from 0 to 45, and those for pain intensity can range from 0 to 50, with higher scores indicating pain that is more severe or more intense. For this sample, the total pain severity and pain intensity scores on the SF-MPQ ranged from 0 to 26 and from 0 to 30, respectively. The amount of pain severity and intensity was normally distributed. Eight-five percent (*n* = 102) of the sample used sensory words to describe their pain, and 60% (*n* = 71) used affective words.

None of the women reported maximum pain severity or intensity scores. Cronbach's alpha for the total pain severity subscale was .87; for the total pain intensity subscale, it was .88.

Pain beliefs were measured with the Survey of Pain Attitudes-35 (SOPA-35), which has seven subscales: pain control, disability, harm, emotion, solicitude, medication, and medical cure; however, due to low reliabilities, a total score was calculated. The reliabilities of the pain belief subscales were very low and not at an acceptable level within this sample. Cronbach's alphas for the subscales were .46 for pain control, .54 for disability, .51 for harm, .71 for emotion, .68 for solicitude, .62 for medication, and .35 for medical cure. A factor analysis was also performed with each of the items in this subscale; however, the factors in this scale loaded differently from what has been found in previous literature.

Due to the low Cronbach's alphas of the subscales and the factor loadings' not supporting the subscales' use, the researcher opted to calculate a total score with this scale. First the designated items in scoring directions were recoded; next, two items were deleted in order to increase the scale's reliability. The items were then added together and divided by the number of items, 33. Cronbach's alpha for the total pain beliefs score was .71.

On the total pain beliefs scale, 41% (*n* = 49) of the women believed that it was very untrue that they were disabled; 25% (*n* = 30) believed that it was very true that they were disabled; and 36% (*n* = 43) believed that it was very true that if their pain continued at the present level they would be unable to work. Thirty-nine percent (*n* = 47) of the women believed that it was very true that exercise and movement were good for their pain; 21% (*n* = 25) believed that it was very untrue that exercise could decrease the amount of pain that they felt; and 21% (*n* = 25) believed that it was very true that exercise could decrease the amount of pain that they felt. Thirty-nine percent (*n* = 47) of the women believed that it was somewhat true that they had the most relief from pain with medications; 40% (*n* = 48) believed that this was very true.

Depressive Symptoms

Depressive symptoms were measured with the Center for Epidemiologic Studies-Depression Scale (CES-D). The scores on the CES-D can range from 0 to 60; higher scores indicate more depressive symptoms. In this sample, the scores were transformed due to positive skewness by taking the square root of each. The scores were normally distributed following transformation: before transformation, they ranged from 0 to 53; after log transformation, they ranged from 0 to 1.73. One participant had a CES-D score of 0, and one participant had a score of 53. The most frequent score was 12, accounting for 8% (*n* = 10) of the sample. Cronbach's alpha for the CES-D for this sample was .89.

Discrimination

Three aspects of perceived discrimination were measured using the GED. First, recent racial discrimination was measured; scores on this subscale can range from 18 to 108, with higher scores indicating more racial discriminatory events occurring over the last year. For this sample, 7% (*n* = 8) reported experiencing no racial discrimination in the last year. The scores on this variable were transformed by taking the log of each score multiplied by 10 due to substantial positive skewness. The scores before transformation ranged from 17 to 99; following log transformation, the scores ranged from 1.26 to 1.98. The scores were normally distributed after log transformations were complete. Cronbach's alpha for the discrimination over the last year subscale was .93.

Second, the GED was used to assess cumulative racial discrimination perceived over the participant's lifetime; scores can range from 18 to 108, with higher scores indicating more discriminatory events. For the women in this study, scores ranged from 18 to 96. Their scores were normally distributed. Two women scored 18, indicating that they had not experienced any racial discrimination over their lifetime. Twenty-seven percent (*n* = 31) felt that their lives would not have been different if they had never experienced racial discrimination. Seventeen percent (*n* = 20) believed that their lives would be different in many ways if they had never experienced racial discrimination, and 4% (*n* = 5) believed that their lives would be totally different if they had never experienced racial discrimination. Cronbach's alpha for the cumulative racial discrimination subscale was .92.

Appraised stress from racial discrimination was also measured with the GED; scores can range from 17 to 102, with higher scores indicating more appraised stress from racial discrimination. The scores for this sample ranged from 17 to 99. Five percent (*n* = 6) had a score of 17, indicating that they had no perceived stress from racial discrimination. The most frequent score was 42, which accounted for 6% (*n* = 7) of the sample. Cronbach's alpha for the appraised stress subscale was .94.

Health Care Access

Health care access was measured with the CAPHS health care access supplement. Scores could range from 0 to 25, with higher scores indicating more access to health care. This scale was originally developed on SAS and used within the larger CAPHS survey (American College of Surgeons, 2012); however, researchers have used it to calculate a total heath care access score (Fongwa, Cunningham, Weech-Maldonado, Gutierrez, & Hays, 2006; Morales, Elliott, Weech-Maldonado, Spritzer, & Hays, 2001). The health care access variable was calculated by summing scores of six items on the health care access supplement survey. One item was recoded, and six of the items were added together. Patient-centered technology and patient-centered care were also subscales measured on this supplement but not used for this particular study.

Due to non-normal distribution of scores, the variable was transformed by multiplying each score by 10 and then taking the log. Following the transformation, the scores were normally distributed. Before transformation, scores ranged from 0 to 25; following log transformation, scores ranged from 0 to 1.4. Before scores were transformed, 5% (*n* = 6) of the women had a score of 0, indicating little or no health care access; .8% (*n* = 1) had a score of 25, indicating the most access. The most frequent score in this sample was 1, accounting for 13% (*n* = 16). Cronbach’s alpha for the health care access supplement was .72.

Findings

Research Question 1: What are the relationships between age, BMI, waist circumference, pain, pain beliefs, health care access, trust in health care providers, cumulative racial discrimination, health care utilization, depression, and function?

All correlations from Question 1 are presented in Table 15. Of note for these women were the relationships between function and three major variables: BMI, health care utilization, depression, and total pain beliefs. Function was significantly related to BMI ($r = .22$, $p < .05$); higher BMI was positively associated with poorer function. Function was also significantly related to total pain severity ($r = .48$, $p < .01$) and pain intensity ($r = .50$, $p < .01$); more pain severity and pain intensity were significantly related to poorer function. Function was positively associated with total pain beliefs ($r = .43$, $p < .01$);. Poorer function was positively associated with more health care utilization (r=. 31, p<.01). Function was also significantly related to depression ($r = .18$, $p < .05$),..

Research Question 2: What are the relationships between age, BMI racial discrimination, cumulative racial discrimination, stress from discrimination, pain, pain beliefs, health care access, depression, and disability?

It is important that there was an association between disability and six main variables: pain severity, pain intensity, total pain beliefs, function, racial discrimination, and depression. The r and p values are reflective of averages after five missing value imputations were done. Imputations were done to account for missing data in the CHART variable. A list of all correlations for Question 2 are presented in Table 16. Disability was negatively associated with total pain severity ($r = –.29$, $p < .01$) and pain intensity ($r = –.34$, $p < .01$); more disability was significantly related to more pain severity and pain intensity. Disability was also significantly related to function ($r = –.44$, $p < .01$); more disability was associated with poorer function. Disability was negatively associated with total pain beliefs ($r = –.27$ $p < .01$); more disability was significantly related to stronger pain beliefs. There was also a significant negative relationship between disability and recent racial discrimination($r = –.24$, $p < .05$). This indicated that more disability was related to more racial discrimination over the last year. There was also a significant negative relationship between depression and disability ($r = –.34$, $p < .01$). This indicated that more disability was related to more depressive symptoms.

Table 15

Correlations for Function

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Function	1											
2. Age	.05	1										
3. BMI	.22*	-.18	1									
4. Waist Circumference	.11	-.19*	.64*	1								
5. Total Pain Severity	.48**	-.18	.09	-.07	1							
6. Pain Intensity	.50**	-.17	.05	-.11	.99**	1						
7. Total Pain Beliefs	.43**	-.13	.05	-.06	.50**	.50**	1					
8. Health Care Utilization	.31**	.00	.02	-.09	.35**	.37**	.05	1				
9. Health Care Access	-.05	-.10	.03	-.13	.07	.06	.02	.17	1			
10. Cumulative Racial Discrimination	.14	.01	-.08	-.08	.13	.13	.07	.26**	.18	1		
11. Trust in Health Care Providers	.04	.21*	.09	.02	.07	.07	-.02	.11	.15	-.16	1	
12. Depression	.18*	-.20*	.08	.03	.26*	.28*	.34**	.22**	-.02	.40**	.20*	1

Note *Correlation is significant at the 0.05 level (two-tailed),
*****Correlation is significant at the 0.01 level (two-tailed)***

Table 16

Correlations for Disability

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Disability	1											
2. Age	-.07	1										
3.BMI	-.06	-.18	1									
4. Total Pain Severity	-.29**	-.18	.09	1								
5. Pain Intensity	-.34**	-.17	.05	.99**	1							
6. Function	-.44**	.05	.22*	.48**	.50**	1						
7. Total Pain Beliefs	-.27**	-.13	.05	.50**	.50**	-.43**	1					
8. Health Care Access	.03	-.10	.03	.07	.06	-.05	.02	1				
9. Racial Discrimination	-.24*	-.20*	.22*	.22*	.24**	.25**	.22**	.23*	1			
10. Cumulative Racial Discrimination	-.11	.01	-.08	.13	.13	.14	.07	.18	.66**	1		
11. Appraised Stress from Racial Discrimination	-.21	-.09	.07	.21*	.22*	.26**	.25**	.12	.54**	.73**	1	
12. Depression	-.34**	-.20*	.08	.26*	.28*	.18*	.34*	-.02	.42**	.40**	.41**	1

Note *Correlation is significant at the 0.05 level (two-tailed),
*****Correlation is significant at the 0.01 level (two-tailed)***

Research Question 3: Which are the significant predictors of function among age, BMI, waist circumference, pain, and depression?

In this analysis, only BMI, pain, and depression were significant predictors of function. Only variables that were significantly related to function were placed in the model. All assumptions were met for this regression analysis. None of the variables in the model showed multicollinearity. In addition, the variance inflation factors were close to one (see Field, 2011). Examination of scatterplots and histograms demonstrated normality, linearity, and homoscedasticity between predicted dependent variable scores and errors of prediction. It was confirmed that errors of prediction were independent of each other, because the Durbin Watson value was two. Lastly, less than 5% of data were missing, with very few outliers present.

The results indicated that the two predictors explained 28% of the variance (adjusted $R^2 = .25$). The overall regression model was statistically significant, ($R^2 = .27$, $F(3, 115) = 13.81$, $p < .001$). BMI, $b = .01$, $\beta = .18$, $t(115) = 2.18$, $p = .03$), and pain severity, ($b = .04$, $\beta = .45$, $t(115) = 5.45$, $p = .00$), were the only significant predictors of function in the model. For every unit of BMI, function scores were .01 units higher; and for every unit of pain severity, function scores were .04 units higher. Both BMI and pain severity significantly predicted poor function, whereas depression did not significantly predict function.

Research Question 4: Which are the significant predictors of disability among pain, pain beliefs, and stress from racial discrimination?

Multiple regression was used to test for significant predictors of disability. Stress from discrimination was not included in the model, because there was no significant relationship between stress from discrimination and disability. None of the variables in the model showed multicollinearity. In addition, the variance inflation factors were close to one. Examination of scatterplots and histograms demonstrated normality, linearity, and homoscedasticity between predicted dependent variable scores and errors of prediction. It was confirmed that errors of prediction were independent of each other, because the Durbin Watson value was 1.9. The Chart variable used to measure disability was missing 17% of the data; therefore, missing value imputations were conducted. R. Warner (2013) and Tabachnik and Fidel (2013) recommended using missing value imputations to address missing data. Missing value imputations are a systematic way of estimating scores for missing values (Warner, 2013). In this study, missing values imputations were conducted using SPSS. First patterns and percentages of missing values were analyzed.. Next, missing values were imputed for only that variable with more than 5% missing data was conducted; the only variable with greater than 5% missing was the CHART variable. The number of imputations conducted was five, which resulted in average *b, t and p values* for analyses.

The results from the original data without missing value imputations showed that the two predictors explained 11% of the variance, adjusted $R^2 = .11$. The overall regression model was statistically significant, (R^2=. 36, $F(2, 95) = 7.27$, $p < .001$). Total pain beliefs did not significantly predict disability in the model, ($b = –37.14$, $\beta = –.23$, $t(95) = –1.72$, $p = .09$). Pain severity did significantly predict disability in the model, (b =

–3.46, $\beta = –.29$, $t(95) = –2.99$, $p = .04$). These results indicate that for every one unit of pain severity, disability scores were 3.46 units lower.

Within this model, over 5% of data were missing from the disability variable (CHART); therefore, five missing value imputations were performed. The results showed that the model remained significant, ($R^2 = .13$, $F(2, 115) = 8.41$, $p < .001$). After five imputations, total pain beliefs did significantly predict disability. For total pain beliefs, the average *b* after five imputations was –45.88, average $t(115) = –2.23$, and the average *p* was .04. Total pain severity remained a significant predictor after five imputations. The average *b* after five imputations was –3.25, average $t(115) = –2.00$, and the average *p* was less than .05. The imputation analysis captured total pain beliefs as a significant predictor, which was not captured before accounting for missing data in the CHART variable.

Research Question 5: Which are the significant predictors of function among pain, pain beliefs, and depression when controlling for biological risk factors (age, BMI, and waist circumference)?

Hierarchical regression was used to determine significant predictors of function after controlling for biological risk factors. In this analysis, BMI was the only biological factor included in the models, because age and waist circumference were not significantly related to function. All assumptions were met for this regression analysis. None of the variables in the model showed multicollinearity. In addition, the variance inflation factors were close to one. Examination of scatterplots and histograms demonstrated normality, linearity, and homoscedasticity between predicted dependent variable scores and errors of prediction. It was confirmed that errors of prediction were independent of each other because the Durbin Watson value was 2.06. Lastly, less than 5% of data were missing, with very few outliers present.

The first block of independent variables in the model included BMI as the predictor; it accounted for 3% of the variance (adjusted $R^2 = .03$). When the second block of independent variables was added to the model (pain, total pain beliefs, and depression), the adjusted R^2 increased to .28, increasing the variance by 28%. The model in the first block was statistically significant, (R^2 =. 04, $F(1, 113) = 5.06$, $p = .03$). The model in the second block, which included pain, total pain beliefs, and depression, was statistically significant, (R^2 change = .27, $F(3, 110) = 12.28$, $p < .001$). Table 17 presents the results of Models 1 and 2.

In Model 1, BMI was a significant predictor of function,($b = .02$, $\beta = .21$, $t(113) = 2.25$), $p = .03$); with every unit change in BMI, function scores were .02 unit higher. In Model 2, when controlling for BMI, the two significant predictors were total pain beliefs, ($b = .33$, $\beta = .26$, $t(110) = 2.73$, $p = .01$), and total pain severity, ($b = .03$, $\beta = .35$, $t(110) = 3.76$, $p = .00$). With every unit increase in total pain beliefs, function scores were .33 units higher; and with one unit total pain severity, function scores were .03 units higher.

Table 17: Question Five- Predictors of Function

Variable	Model 1 Unstandardized *b*	Model 1 Standardized *β*	Model 2 Unstandardized *b*	Model 2 Standardized *β*
BMI	.02	.21*	.01	.17
Total Pain Beliefs			.33	.26*
Depression			-.04	-.02
Pain Severity			.03	.35*
R^2	.04			.31
F	5.06*			12.28**
R^2 Change				.27
F Change				14.10

*Significance at .05. **Significance at .01. All subscales are from the Survey of Pain Attitudes Instrument that measured pain beliefs.

Research Question 6: Does health care access moderate the relationship between function and disability?

Health care access was not significantly related to function or disability; therefore, a simple linear regression was used to test the relationship between function and disability, and health care access was not included in this analysis. All assumptions were met. Examination of scatterplots and histograms demonstrated normality, linearity, and homoscedasticity between predicted dependent variable scores and errors of prediction. It was confirmed that errors of prediction were independent of each other; the Durbin Watson value was 1.68. The CHART variable did have greater than 5% missing data; therefore, five missing value imputations were performed.

Function was a significant predictor of disability, (b = –69.78, β = –.47, t(98) = –5.21, p = .00). The model was statistically significant, (adjusted R^2 = .21, F(1, 98) = 27.15, p = .00). After performing missing value imputations, the model was still statistically significant, (adjusted R^2 =. 21, F(1, 118) = 31.91, p = .00), and function remained a significant predictor of disability. The average b across five imputations was –71.34; average t(118) = –5.40, and all p values were less than .001. Even after five missing value imputations, function remained a significant predictor of disability, and the model was significant. For every unit increase in function scores, disability scores decreased by 71.34 units.

Research Question 7: Does health care utilization mediate the relationship between trust in health care providers and function?

A series of regression models was used to test whether health care utilization mediated the relationship between trust in health care providers and function. All assumptions were met. None of the variables in the model showed multicollinearity. In addition, the variance inflation factors were close to one. Examination of scatterplots and histograms demonstrated normality, linearity, and homoscedasticity between predicted dependent variable scores and errors of prediction. It was confirmed that errors of prediction were independent of each other; the Durbin Watson value was 1.77. Lastly, less than 5% data were missing, with very few outliers present. Within this model, over 5% of data were missing from the disability variable (CHART); therefore, multiple imputations were conducted.

In Step 1 of this test for mediation, function was regressed on trust in health care providers; however, trust in health care providers did not significantly predict function, ($b = .03$, $\beta = .04$, $t(118) = .45$, $p = .66$). In Step 2, trust in health care providers did not significantly predict health care utilization, ($b = .22$, $\beta = .06$, $t(118) = .61$, $p = .54$). Because trust in health care providers did not significantly predict function or health care utilization, it was determined that health care utilization did not mediate the relationship between trust in health care providers and function. This finding was expected, since health care utilization and trust in health care providers were not significantly related to function. In addition, Barry and Kenny (1986) have shown that if X (trust in health care providers) does not significantly predict Y (disability) and if X does not significantly predict M (health care utilization), then M is not a mediator in the model.

Research Question 8: Does stress from racial discrimination mediate the relationship between racial discrimination and disability?

A series of regression models was used to test whether stress from racial discrimination mediated the relationship between racial discrimination and disability. All assumptions were met. None of the variables in the model showed multicollinearity. In addition, the variance inflation factors were close to one. Examination of scatterplots and histograms demonstrated normality, linearity, and homoscedasticity between predicted dependent variable scores and errors of prediction. It was confirmed that errors of prediction were independent of each other; the Durbin Watson value was 1.77. Within this model, over 5% of data were missing from the disability variable (CHART); therefore missing value imputation was performed.

In the first step of this analysis, racial discrimination did significantly predict disability, (b = –130.48, β = –. 24, t (98) = –2.48, p = .02). After performing five imputations, the first model, which regressed disability on racial discrimination, remained significant, (R^2 = .07, F (1, 118) = 8.97, p = .01), and racial discrimination remained a significant predictor of disability, with the average b across five imputations at –133.71, average t (118) = –2.64, and the average p values less than .05. When testing whether racial discrimination significantly predicted disability, the model accounted for 5% of the variance, adjusted R^2 =. 05. The next step was to test whether racial discrimination predicted stress from racial discrimination. Racial discrimination did significantly predict stress from racial discrimination, (b = 68.06, β = .54, t (118) = 6.98, p = .00). Missing value imputations were not needed, because less than 5% of data were missing.

The next step was a hierarchical regression to test whether stress from racial discrimination predicted disability when controlling for racial discrimination. The first model was not significant, (R^2 =. 04, *F* (1, 98) = 3.58, *p* = .06). Although the second model was significant, stress from racial discrimination did not significantly predict disability when controlling for racial discrimination, (*b* = –. 81, β = –. 18, *t* (98) = –1.89, *p* = .06). Since *M* (stress from racial discrimination) did not significantly predict *Y* (disability), it could be assumed that stress did not mediate the relationship between racial discrimination and function. Given these results, stress from racial discrimination did not mediate the relationship between racial discrimination and disability.

Stress from racial discrimination was not a significant predictor of disability in this first model; the average *b* across five imputations was –. 37, average *t* (117) = –. 81, and p values were larger than .05. After five imputations the first model was significant (R^2 =. 05, *F* (1, 118) = 5.70, *p* = .02), as well as the second model (R^2 change = .05, *F* (1, 118) = 3.91, *p* = .02). In the second model, racial discrimination was controlled while testing whether stress from racial discrimina3ion significantly predicted disability. Stress from racial discrimination was not a significant predictor of disability in the second model. The missing value imputations maintained that stress from racial discrimination did not predict disability; although more than 5% of the data were missing in the CHART variable, stress from racial discrimination still did not mediate the relationship between racial discrimination and disability.

Question 9: Does depression mediate the relationship between racial discrimination and disability?

A series of regression models was used to test whether depression mediated the relationship between racial discrimination and disability. All assumptions were met. None of the variables in the model showed multicollinearity. In addition, the variance inflation factors were close to one. Examination of scatterplots and histograms demonstrated normality, linearity, and homoscedasticity between predicted dependent variable scores and errors of prediction. It was confirmed that errors of prediction were independent of each other; the Durbin Watson values were within appropriate limits. Within this model, over 5% of the data were missing from the disability variable (CHART), so missing value imputations were performed on this variable.

First it was tested whether racial discrimination significantly predicted disability. Racial discrimination did significantly predict disability, (b = –130.48, β = –. 24, t (98) = –2.48, p = .02). After missing imputations, racial discrimination remained a significant predictor of disability; the average b across five imputations was –131.71, average t (118) = –2.64, and average p values were less than .05. The model was statistically significant, (R^2 = .06, F (1, 97) = 6.15, p = .02). After missing value imputations, the model was still significant, (R^2 = .07, F (1, 118) = 8.97, p = .01). Next it was tested whether racial discrimination significantly predicted depression, (b = .73, β =. 43, t (117) = 5.09, p = .00); racial discrimination did significantly predict disability. The model was statistically significant, (R^2 = .18, F (1, 117) = 25.91 p = .00).

The next step in this analysis was to test whether depression predicted disability when controlling for racial discrimination. The first model was statistically significant, (R^2 = .06, F (1, 97) = 6.15, p = .02), and remained significant after missing value imputations. The second model was significant, ($R^2 = .13$, F (2, 96) = 7.35, $p = .01$). After missing value imputations, the model was still significant, ($R^2 = .14$, F (2, 118) = 9.69, $p = .00$). The adjusted R^2 change was .12, and the F_2 change was 7.55, $p < .01$. In the second model depression did predict disability ($b = –100.91$, $\beta = –. 30$, t (96) = –2.82, $p = .01$), while racial discrimination was no longer a significant predictor of disability. After missing value imputations depression remained a significant predictor of disability while controlling for racial discrimination; the average b across five imputations was –72.16, average t (118) = –2.07, and the average p values were less than .05. Racial discrimination did not predict disability when in the same model with depression; the average b across five imputations was –68.12, average t (118) = –1.19, and the average p values were equal to .24. Because racial discrimination was not significant in the second model there is strong evidence that depression is a dominant mediator (see Baron & Kenny, 1986).

The next step in this analysis was to perform a Sobel test. The Sobel test was performed using an SPSS macro. The indirect effect of racial discrimination on disability through depressive symptoms was -54.15 and was significant with $p<. 05$. The results from the Sobel test supported that there was a direct effect of racial discrimination on disability, while controlling for depressive symptoms. This direct effect was -52.40 ($p<. 05$).

SUMMARY

In summary, there was a significant relationship between function and BMI, total pain severity, total pain beliefs, health care utilization, and depression, Disability was significantly related to total pain severity, total pain intensity, total pain beliefs, racial discrimination, and depression.

In this sample of African American women with OA, total pain severity was a significant predictor of function and disability in three different regression models. When controlling for BMI, total pain severity and total pain beliefs were significant predictors of function. Health care access did not moderate the relationship between function and disability, although function was a significant predictor of disability. In addition, health care utilization did not mediate the relationship between trust in health care providers and function. Stress from racial discrimination did not mediate the relationship between racial discrimination and disability, although racial discrimination was a significant predictor of disability and stress from racial discrimination. Lastly, depression was a significant mediator of the relationship between racial discrimination and disability.

Chapter 5:Discussion

Little is known about the multiple factors related to the high rates of functional limitations and disabilities in African American women with OA (Bolen et al., 2010); hence, this study is intended to add to our knowledge of factors that may be related to these disparities within this population group. The study extends previous findings that BMI, pain, and depression are related to function outcomes within African American women (Baker & Whitfield, 2006; Koster et al., 2008); to this previous literature, the study provides a unique contribution by examining pain beliefs, trust in health care providers, and racial discrimination as predictors of function and disability as well. Although these factors have been studied in relation to health outcomes, researchers have not examined how they influence function and disability within African American women with OA.

This study was important because the findings show that the risk profile for functional limitations and disabilities in this sample of African American women with OA included other factors in addition to biological risk factors. The women's health, environment, and reactions to their health and environment can all influence their participation in social roles. The results of this study support that African American women with OA may have poorer function and less social role performance if they experience more depressive symptoms, have strong beliefs about their pain, and/or are exposed to racial discrimination. The knowledge gained from this study can provide a strong foundation that can lead to the development of appropriate interventions focused on improving function and decreasing disability rates in African American women with OA.

The findings suggest that the disablement process in African American women with OA does not occur in a social vacuum (Verbrugge & Jette, 1994), but is influenced by various factors in the women's lives that may contribute to poorer function and greater disability. The results are consistent with those of previous studies in minority women that showed the pathway to disability was not necessarily a linear path from pathology to function to disability; the path to disability can be influenced by various biological risk factors, intra-individual factors, and extra-individual factors (Harrison, Walker, Hendrickson, & Blozis, 2012). In the present study social environments, personal beliefs, and personal risk factors uniquely affected disablement outcomes in the sample. These women did not simply progress to functional limitations and disability because they developed OA; multiple factors were related to their outcomes.

Main Pathway: Function and Disability

Function

In the present study, function was theorized as an outcome on the main pathway of the disablement process model: It was important to understand how biological risk factors, intra-individual psychosocial factors, and cumulative extra-individual factors were significantly related to or significantly predicted function in a sample of African American women with OA, in order to learn in detail how the factors influence the women's abilities to use their bodies to engage in specific activities (Verbrugge & Jette, 1994).

BMI was the only risk factor associated with function. Higher BMI was associated with poorer function, (r = .22, p < .05), which was consistent with previous literature (Al Snih et al., 2007; Colbert et al., 2013). Function was not significantly related to age, (r = .05, p = .56), or waist circumference, (r = .11, p = .25), which was not consistent with previous findings in which older age and larger waist circumferences have been related to poorer function (Dunlop et al., 2005; Houston et al., 2005). Although not significant, older age and larger waist circumference were related to poorer function.

Function was positively related to the following intra-individual factors: total pain severity, (r = .48, p < .01), pain intensity, (r =. 50, p < .01), total pain beliefs, (r = .43, p < .01), health care utilization, (r = .31, p < .04), and depression, (r = .18, p < .05). It was of course expected that more pain severity and intensity would be related to more functional limitations (Baker & Whitfield, 2006; Clark et al., 1997); pain, for example, can make it difficult for women to engage in specific functional tasks such as climbing stairs or walking (Harrison, 2009a). Greater health care utilization was related to poorer function, (r = .31, p < .01). Researchers have previously reported that less health care utilization is related to poorer health outcomes (Sharma, 2012), but no studies with an examination of health care utilization and function have been noted. If the women were experiencing difficulty performing functional tasks, they may have utilized health care more in an attempt to improve their function. Finally, more depressive symptoms were related to poorer function, (r = .18, p < .05), which is also consistent with previous literature (Baker & Whitfield, 2006; Dunlop et al., 2005). The women’s depressive symptoms (e.g., fatigue, sad mood, loss of interest) may have made it more difficult for them to engage physically in specific tasks.

Function was not significantly related to the intra-individual psychosocial factor of trust in health care providers, (r = .04, p = .66), or the cumulative extra-individual factor of racial discrimination, (r = .14, p = .13). Although not significant, trust in health care providers and racial discrimination were positively associated with function; greater trust and racial discrimination were associated with poorer function. Researchers have not previously examined these factors in relation to function outcomes in African American women with OA. Trust in health care providers and cumulative racial discrimination may not have had a relationship to the women's ability to perform physical activities.

BMI was a significant predictor of function in this sample. Higher BMI was predictive of poorer function, (b = .01, β = .18, t (115) = 2.18, p = .03). The women with higher BMI may have had more weight on their joints, which may have made it more difficult to accomplish tasks such as walking, reaching, etc. In testing whether pain severity, pain beliefs, or depression were significant predictors of function while controlling for BMI, the significant predictors of function were total pain beliefs, (b = .33, β = .26, t (110) = 2.73, p = .01), and total pain severity, (b = .03, β = .35, t (110) = 3.76, p = .00). This demonstrates that while holding BMI constant, pain beliefs and pain severity were predictive of function outcomes in African American women with OA. Researchers have reported that more pain was predictive of poorer function in African Americans (Cruz-Almeida et al., 2014), but there is scant literature on pain beliefs as a predictor of function in African American women.

Health care utilization did not mediate the relationship between trust in health care providers and function. Trust in health care providers did not significantly predict function, ($b = .03$, $\beta = .04$, t (118) = .45, $p = .66$), or health care utilization, ($b = .22$, $\beta = .06$, t (118)=. 61, $p = .54$). Although researchers have previously reported that trust in health providers was related to health outcomes and adherence to medical recommendations (O'Malley, Sheppard, Schwartz, & Mandelblatt, 2004; Saha, Jacobs, Moore, & Beach, 2010), in this sample, trust in health care providers was not significantly related to health care utilization or function. Researchers have reported that older adults can still be satisfied with care without trusting their providers (Hupcey & Miller, 2006); hence, in this population, trust in health care providers may not have been related to the women's decisions to utilize available health care. In addition, a measure for health care adherence instead of health care utilization may have been more appropriate to test this model.

Disability

In the present study, disability was the final outcome variable in the main pathway of the disablement process model; the researcher examined what biological risk factors, intra-individual psychosocial factors, and cumulative extra-individual factors were significantly related to disability. Addressing the factors that are related to disability outcomes in African American women may increase the women's social involvement and independence (Verbrugge & Jette, 1994).

Disability was not significantly related to any of the biological risk factors. Unlike in previous studies (D.F. Warner & Brown, 2011), disability was not significantly related to age in this sample, (*r* = –. 07 *p* = .51). One would have expected the women to have more difficulty in maintaining social roles at older ages; however, within this sample, the older women may not have experienced this difficulty. Disability was not significantly related to BMI, (*r* = –. 06, *p* = .58), which was also not consistent with previous literature (Al Snih et al., 2007). However, although not significant, BMI was negatively associated with disability; higher BMI was associated with greater disability. BMI may not have prohibited the women from participating in social roles.

The intra-individual factors of pain, total pain beliefs, and depression were significantly related to disability. Disability was negatively associated with total pain severity, (*r* = .29, *p* < .01), and total pain intensity, (*r* = .34, *p* < .01). Greater pain severity and pain intensity were related to greater disability. This finding is consistent with previous literature in African Americans (Parmelee et al., 2012). The women may have found it more difficult to participate in social roles if they were experiencing more severe and/or intense pain. Disability was also negatively associated with pain beliefs, (*r* = –. 27, *p* < .01). Researchers have reported various pain beliefs significantly related to disability in African American populations (Tan et al., 2005). A person's personal beliefs about their impairment, pain, and/or control over their pain may be related to their engagement in social roles (Harrison & Kahn, 2004).

Disability was negatively correlated with depression, (*r* = –. 34, *p* < .01). More depressive symptoms were significantly related to greater disability. These findings were consistent with previous literature (Creamer et al., 2000; Parmelee et al., 2012). If the women were experiencing more depressive symptoms, they may have had more difficulty participating in social roles.

Disability was related to the extra-individual factor of racial discrimination, but it was not related to stress from racial discrimination, (r = –. 21, p =. 06), or to cumulative racial discrimination, (r = –. 11, p = .34). Disability was negatively correlated with racial discrimination over the last year, (r = –. 24, p < .05). Researchers have previously reported that racial discrimination is significantly related to health outcomes in African American women (Coogan et al., 2014; Guyll et al., 2001); in the present study, it was found that more racial discrimination was significantly related to more disability. Researchers have reported that stress from racial discrimination and racial discrimination over one's lifetime were significantly related to poorer health outcomes (Estrada-Martinez et al., 2012; Kwate et al., 2003); however, these factors were not related to disability in the present study. The women may not have perceived racial discrimination as stressful because they dealt with it by retreating from social roles or by using other mechanisms.

Function was negatively associated with disability, (r = –. 44, p < .01). Poorer function was related to more disability. This was expected; function limitations are often related to greater disability in people with chronic conditions (Verbrugge & Jette, 1994).

Total pain severity (b = –3.46, β = –. 29, t (95) = –2.99, p <. 05) significantly predicted disability; however, total pain beliefs, (b = –37.14, β = –. 23, t (95) = –1.72, p = .09) did not significantly predict disability. The women with more pain severity had less social role participation.

Health care access did not moderate the relationship between function and disability. Function did significantly predict disability, (b = –71.34, β = –. 47, t (118) = –5.40, p < .001); however, health care access was not significantly related to function or disability. Poorer function significantly predicted more disability, which is consistent with previous findings in various older minority groups (Mangione et al., 2010; Ostir, Markides, Black, & Goodwin, 1998; Vermeulen, Neyens, van Rossum, Spreeuwenberg, & de Witte, 2011). Women who had greater difficulty in performing functional tasks were less likely to participate in social roles; the relationship was not affected by their access to health care.

Stress from racial discrimination did not mediate the relationship between racial discrimination and disability. Stress from racial discrimination did not significantly predict disability, (b = –. 37, β = –. 09, t (117) = –. .81, p >.05.); however, racial discrimination did significantly predict disability, (b = –131.71, β= –. 24, t (118) = –2.64, p < .05). Researchers have previously reported that racial discrimination is a predictor of poor health outcomes in African American women (Chae et al., 2010; Coogan et al., 2014); in the present sample racial discrimination was a significant predictor of disability.

Depression did significantly mediate the relationship between racial discrimination and disability. Racial discrimination significantly predicted disability, (b = –131.71, β = .24, t (118) = –2.64, p < .05), and depression, (b = .73, β = .43, t (117) = 5.09, $p \leq .01$), and depression significantly predicted disability when controlling for racial discrimination, (b = –72.16, β =. 43, t (118) = –2.07, p< .05). Researchers have reported that racial discrimination is predictive of depressive symptoms (Mcllvane et al., 2008).

The women might have experienced racial discrimination in the past year that was related to depressive symptoms. Racial discrimination can lead to differential access to resources, and it supports negative cultural stereotypes that can negatively affect mental health (J. W. Williams, Kerber, Mulrow, Medina, & Aguilar, 1995). Racial discrimination was indirectly related to disability through depression.

Relationships Among Biological Risk Factors, Intra-Individual Psychosocial Factors, and Cumulative Extra-Individual Factors

There were significant relationships among the biological risk factors, intra-individual factors, and cumulative-extra individual factors. Trust in health care providers was significantly related to age, ($r = .21$, $p < .05$). Older women had more trust in their health care providers. This is consistent with previous literature where older African Americans and older adults had higher trust in health care providers (Bell et al., 2013; O'Malley et al., 2004). The older women may have had more time to develop an established patient–provider relationship, which may explain greater trust. Health care utilization was positively associated with pain severity (r=. 35, p<. 01). Researchers have previously reported that more pain episodes were related to more health care utilization in African Americans (Bedaiko, Lavender & Yasin, 2007). The women may seek out health care if they are experiencing more pain.

Depression was significantly related to total pain severity, ($r = .26$, $p < .05$), and total pain intensity, ($r = .28$, $p < .05$). Greater pain severity and higher pain intensity were positively correlated with depressive symptoms, which is consistent with previous literature (Uebelacker et al., 2013; Weiner et al., 2003). Depression was negatively correlated with trust in health care providers, ($r = -.20$, $p < .01$). Minority women may not seek adequate treatment for depressive symptoms due to a lack of trust in mental health care providers (Atdjian & Vega, 2005). Finally, depression was significantly related to racial discrimination, ($r = .42$, $p < .01$), and cumulative racial discrimination, ($r = .40$, $p < .01$), which is consistent with previous literature (Estrada-Martinez et al., 2012; McIlvane et al., 2008). The cumulative racial discrimination that the women experienced over their lifetimes was related to their mental health in middle and late adulthood.

Theoretical Framework

The present study verifies that the disablement process model is a useful theoretical approach for understanding how biological risk factors, intra-individual psychosocial factors, and extra-individual factors are related to function and disability in middle-aged and older African American women with OA. Verbrugge and Jette (1994) posited that certain risk factors can elevate the chances of functional limitations. In the present study, BMI was theorized as a risk factor and was found to be predictive of functional limitations. Verbrugge and Jette also posited that internal, intra-individual factors and environmental, extra-individual factors may exacerbate functional limitations and disabilities. In the present study, pain severity, pain intensity, pain beliefs, and depression were theorized as intra-individual factors, and they were found to be related to functional limitations and more disability. In addition, racial discrimination was theorized as an extra-individual factor, and it had an indirect effect on disability. Verbrugge and Jette's model therefore provided a sound framework for understanding how various factors influenced disablement outcomes in a sample of African American women with

OA. Further work is needed using this theoretical guide to increase our understanding of disablement outcomes in African American women.

Cumulative inequality theory was also an appropriate guide for this study. Although the cumulative inequality factor of racial discrimination over one's lifetime was not significantly related to disability or function, this does not negate the theory's usefulness. Cumulative racial discrimination was positively correlated with more depressive symptoms in the women, suggesting that racial discrimination across their lifetime was related to mental health outcomes in middle and late adulthood. Racial discrimination can be characterized as a lack of access to resources and an exposure to negative stereotypes that can negatively affect mental health outcomes (J. W. Williams et al., 1995). Cumulative inequality theory assumes that an accumulation of disadvantages over the life course can adversely affect health outcomes in later life (Ferraro & Shippee, 2009; Hatch 2005). Further work is therefore needed to understand how cumulative inequalities can affect function, disability, and health outcomes in middle-aged and older African American women.

LIMITATIONS

There were limitations to this study. First, the study was cross-sectional; causality cannot be assumed from such a design. Self-report was used, which can present limitations because participants might have difficulty remembering or might inaccurately report data. The women's self-report of weight and height might not have been accurate, and they might have measured their waist circumferences or hip circumferences inaccurately. In addition, the results of this study cannot be generalized beyond this sample of African American women with OA between the ages of 50 and 80 from Texas and New Mexico. Finally, comorbidities were not measured, so their effect on disability and function outcomes were not taken into account.

There were limitations to the instruments used as well. The CAHPS 2.0 Supplement Health Care Access instrument was developed to measure health care access in large populations, where providers were seeking information about patients' satisfaction and perceived access to health care (USDHHS, 2012). CAHPS 2.0 is usually included with the larger CAHPS survey. Here, health care access was partially measured through the patients' ability to access it through technology (i.e., to make appointments online). Although accessing health care through technology may have been an important component in the outcomes for these women, it might not have been truly representative of their overall access to health care. In addition, the design of the instrument allowed participants to skip questions that did not apply to them, which may have caused important data to be missed.

A total of five of the subscales on the Survey of Pain attitudes had low reliabilities. Due to the low reliabilities of the subscales in this sample, a total composite score for pain beliefs was calculated. No studies were found in which this instrument was tested within a sample of only African Americans or African American women, although researchers have reported the instrument's use in comparative studies that included African Americans. Although the subscales on the SOPA-35 had low reliabilities this was an important finding in this study because it showed that the factors on this scale did not load the same way when used for this sample as they were originally intended to load with the original sample. This serendipitous finding demonstrates that pain beliefs are related to disablement outcomes overall, but further work is needed to tease out how the nuances of these beliefs and how these views are shared by this population of African American Women.

To address these limitations, the following methodological changes could be made. Women could be weighed and measured by the researcher in order to ensure accuracy of measurements. Comorbidities could be measured and controlled for. In addition, an alternative instrument could be considered for measuring health care access. The SOPA 57-item scale might be an alternative instrument to use instead of the SOPA – 35. The SOPA 57 is the original version of the instrument; it has demonstrated higher reliabilities across subscales than the SOPA 35 (Jensen, Turner, & Romano, 2000).

Despite these limitations, the present study provides valuable information regarding how biological risk factors, intra-individual psychosocial factors, and cumulative extra-individual factors were related to function and disability outcomes in a sample of African American women with OA. The study contributes to the body of knowledge surrounding function and disability outcomes in such women.

IMPLICATIONS AND RECOMMENDATIONS FOR HEALTH CARE PROVIDERS, FUTURE STUDIES, AND HEALTH POLICY

Healthcare Practice

Due to the alarming effects that functional limitations and high disability rates can have on middle-aged and older African American women with OA, it is essential that health care providers understand the factors that may influence them. Functional limitations are related to more comorbidities and poorer health outcomes (Furner et al., 2004; Payette et al., 2011), and disability is related to poorer quality of life and higher mortality rates in women (Harrison, 2009a; Jones, 2009). To effectively decrease disability rates, interventions need to be framed around accommodations, psychosocial coping, environmental alterations, and external support (Verbrugge & Jette, 1994).

It is important for health care providers to understand the biological risk factors associated with poorer function in African American women with OA. BMI significantly predicted functional limitations in this sample. It is therefore important that health care providers educate African American women on maintaining health weight and explain the implications it can have for function. Clinical interventions to decrease weight in African American women with high BMIs could include strategies such as increasing family support, improving dietary habits, and increasing knowledge about appropriate physical exercise for women with OA (Moore-Greene, Gross, Silver, & Perrino, 2012). Assisting the women in improving their BMI could decrease their risk of developing functional limitations.

It is also essential that health care providers address the intra-individual psychosocial factors that influence function and disability outcomes in African American women with OA. Pain severity predicted functional decline. Pain beliefs were predictive of function and disability. Health care providers must therefore understand the pain experience of African American women. A thorough assessment of pain severity, description of pain, and pain beliefs can lead to appropriate treatments for pain. According to Linton and Shaw (2011), integrating holistic patient-centered care that includes an assessment of beliefs and experiences surrounding pain into a person's pain treatment plan can lead to better outcomes.

It is also essential that health care providers assess for depressive symptoms and refer African American women with depressive symptoms to appropriate mental health care providers. Taylor, Henderson, and Jackson (1991) posited that effective interventions for depression in African American women should stem from a holistic model that focuses on coping skills, social management skills, and health promotion. Coping skills targeted toward helping the women deal with racial discrimination may also be needed.

Nurse Researchers

Although in this study biological risk factors, intra-individual factors, and extra-individual factors predicted function and disability outcomes, further work is needed in order to understand the mechanisms of these factors and how to address them to improve function and disability outcomes. Directions for future research include the following:

1. Path analysis studies are needed to test the complex relationships of biological factors, intra-individual factors, and cumulative inequality, function, and disability in middle-aged and older African American women with OA.

2. Longitudinal studies in African American women with OA could capture the cumulative effect that variables have on the progression to functional limitations and disability. Longitudinal studies done over years can show how various factors moderate the progression to functional limitations and disability (Stuifbergen, Blozis, Harrison, & Becker, 2006).

3. Future qualitative studies are needed to understand the pain beliefs of African American women with OA. In this study, pain beliefs were significantly related to function and disability outcomes; however, the total score for pain beliefs did not provide information on what the beliefs and attitudes of the women were.

4. Researchers should develop interventions that address pain, pain beliefs, psychosocial coping from racial discrimination, and depressive symptoms in middle-aged and older African American women with OA. Addressing these factors may help improve function and decrease disabilities in this group (Verbrugge & Jette, 1994).

5. Future studies should test predictors of function and disability in African American women with conditions such as rheumatoid arthritis, lupus, or diabetes in order to obtain knowledge on disablement outcomes in women with other chronic conditions.

6. Researchers should also compare disablement outcomes in middle-aged and older African American women and in middle-aged and Black women from other geographical locations such as Canada or the Caribbean. Comparing origins of variability in older minorities can assist researchers in understanding genetic and environmental influences on aging (Whitfield & Baker-Thomas, 1999) and disability outcomes.

Health Care Policy

Approximately 4.6 million African American women report having OA and have high rates of functional limitations and disabilities (Bolen et al., 2010); if health care policymakers prioritize improving functional limitations and decreasing disability in these women, it will improve their independence (Harrison & Kahn, 2004) and quality of life (Stuifbergen et al., 2009). First, African American women with OA should have access to interventions that address factors contributing to functional limitations and disability. For example, access to pain management specialists is needed (Mossey, 2011). A mandate for screening for depressive symptoms during health care interactions and providing access to mental health care is also needed (Taylor et al., 1991). Ensuring that middle-aged and older African American women have access to such interventions can decrease their risk of developing functional limitations and disability.

Second, health care policymakers should allocate funds for research on disablement outcomes within African American women. Because of their high rates of disability, further research must be done to understand factors influencing disablement in this group. Further research is also needed to develop culturally tailored interventions for these women. African American women have unique risk factors, intra-individual psychosocial factors, and extra-individual factors that are unaddressed in research studies. Conducting future studies that build on the present one can eventually lead to development of interventions targeted toward improving function and decreasing disabilities in African American women with OA. Although population-based studies that compare African American women with women of other racial/ethnic groups provide vital information, they do not provide knowledge about how to meet the unique needs of this group. “When the range of within-group variability is known, more effective policies that effect minorities can be implemented” (Whitfield & Baker-Thomas, 1999, p. 77)

CONCLUSION

This study provides a unique contribution to the literature because of the examination of biological risk factors, intra-individual factors, and cumulative extra-individual factors theorized to be related to disablement outcomes within African American women with OA. Frequently, researchers examine disablement outcomes using population-based studies in which they compare outcomes across various racial/ethnic groups and between sexes (Harrison, 2009a). The results of this study, however, provide knowledge about disablement within African American women. It is demonstrated here that BMI and pain severity are predictive of function, as in previous literature; however, pain beliefs, depression, and racial discrimination in African American women with OA have not previously been studied. The results indicate that disablement outcomes in African American women with OA are associated with multiple factors that are unique to this group.

When health care providers and nurse researchers address only the biological risk factors (BMI), they fail to address other important factors that also are related to functional limitations and disabilities. The relationships of disease progression, biological risk factors, intra-individual factors, and cumulative extra-individual factors are complicated, but once nurse researchers can tease out more information about these relationships, they will begin to understand how to decrease disability rates, improve health outcomes, and improve quality of life (Harrison, 2009a) in middle-aged and older African American women with OA.

Appendix A

OFFICE OF RESEARCH SUPPORT

THE UNIVERSITY OF TEXAS AT AUSTIN

P.O. Box 7426, Austin, Texas 78713 ·
Mail Code A3200 (512) 471-8871 · FAX
(512) 471-8873

FWA # 00002030
Date: 12/18/13
PI: Janiece L. Walker
Dept: Nursing
Title: Predictors of Disability among Middle-aged and Older African American Women with OA

Re: IRB Expedited Continuing Review Approval for

Protocol Number 2012-11-0090

Dear Janiece L. Walker

In accordance with the Federal Regulations the Institutional Review Board (IRB) reviewed the above referenced research study continuing review report and found it met the requirements for approval under the Expedited category noted below for the following period of time: 1/17/2014 to 1/16/2015. *Expires 12 a.m. [midnight] of this date.*

Expedited category of approval:

1) Clinical studies of drugs and medical devices only when condition (a) or (b) is met. (a) Research on drugs for which an investigational new drug application (21 CFR Part 312) is not required. (Note: Research on marketed drugs that significantly increases the risks or decreases the acceptability of the risks associated with the use of the product is not eligible for expedited review). (b) Research on medical devices for which (i) an investigational device exemption application (21 CFR Part 812) is not required; or (ii) the medical device is cleared/approved for marketing and the medical device is being used in accordance with its cleared/approved labeling.

2) Collection of blood samples by finger stick, heel stick, ear stick, or venipuncture as follows: (a) from healthy, non-pregnant adults who weigh at least 110 pounds. For these

subjects, the amounts drawn may not exceed 550 ml in an 8 week period and collection may not occur more frequently than 2 times per week; or (b) from other adults and children, considering the age, weight, and health of the subjects, the collection procedure, the amount of blood to be collected, and the frequency with which it will be collected. For these subjects, the amount drawn may not exceed the lesser of 50 ml or 3 ml per kg in an 8 week period and collection may not occur more frequently than 2 times per week.

3) Prospective collection of biological specimens for research purposes by non-invasive means. Examples:

- (a) Hair and nail clippings in a non-disfiguring manner.
- (b) Deciduous teeth at time of exfoliation or if routine patient care indicates a need for extraction.
- (c) Permanent teeth if routine patient care indicates a need for extraction.
- (d) Excreta and external secretions (including sweat).

Uncannulated saliva collected either in an un-stimulated fashion or stimulated by chewing gumbase or wax or by applying a dilute citric solution to the tongue.

(e) Placenta removed at delivery.
(f) Amniotic fluid obtained at the time of rupture of the membrane prior to or during labor.
(g) Supra- and subgingival dental plaque and calculus, provided the collection procedure is not more invasive than routine prophylactic scaling of the teeth and the process is accomplished in accordance with accepted prophylactic techniques.
(h) Mucosal and skin cells collected by buccal scraping or swab, skin swab, or mouth washings.
(i) Sputum collected after saline mist nebulization.

4) Collection of data through non-invasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing. (Studies intended to evaluate the safety and effectiveness of the medical device are not generally eligible for expedited review, including studies of cleared medical devices for new indications). Examples:

(a) Physical sensors that are applied either to the surface of the body or at a distance and do not involve input of significant amounts of energy into the subject or an invasion of the subject's privacy.
(b) Weighing or testing sensory acuity.
(c) Magnetic resonance imaging.
(d) Electrocardiography, electroencephalography, thermography, detection of naturally occurring radioactivity, electroretinography, ultrasound, diagnostic infrared imaging, doppler blood flow, and echocardiography.
(e) Moderate exercise, muscular strength testing, body composition assessment, and flexibility testing where appropriate given the age, weight, and health of the individual.

5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for non-research purposes (such as medical treatment or diagnosis). Note: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(4). This listing refers only to research that is not exempt.

6) Collection of data from voice, video, digital, or image recordings made for research purposes.

7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. Note: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.

Use the attached approved informed consent document(s).

You have been granted a Waiver of Documentation of Consent according to 45 CFR 46.117 and/or 21 CFR 56.109(c)(1).

You have been granted a Waiver of Informed Consent according to 45 CFR 46.116(d).

Responsibilities of the Principal Investigator:

1. Report immediately to the IRB any unanticipated problems.

2. Submit for review and approval by the IRB all modifications to the protocol or consent form(s). Ensure the proposed changes in the approved research are not applied without prior IRB review and approval, except when necessary to eliminate apparent immediate hazards to the subject. Changes in approved research implemented without IRB review and approval initiated to eliminate apparent immediate hazards to the subject must be promptly reported to the IRB, and will be reviewed under the unanticipated problems policy to determine whether the change was consistent with ensuring the subjects continued welfare.

3. Report any significant findings that become known in the course of the research that might affect the willingness of subjects to continue to participate.

4. Ensure that only persons formally approved by the IRB enroll subjects.

5. Use only a currently approved consent form, if applicable. Note: Approval periods are for 12 months or less.

6. Protect the confidentiality of all persons and personally identifiable data, and train your staff and collaborators on policies and procedures for ensuring the privacy and confidentiality of subjects and their information.

7. Submit a Continuing Review Application for continuing review by the IRB. Federal regulations require IRB review of on-going projects no less than once a year a reminder letter will be sent to you two months before your expiration date. If a reminder is not received from Office of Research Support (ORS) about your upcoming continuing review, it is still the primary responsibility of the Principal Investigator not to conduct research activities on or after the expiration date. The Continuing Review Application must be submitted, reviewed and approved, before the expiration date.

8. Upon completion of the research study, a Closure Report must be submitted to the ORS.

9. Include the IRB study number on all future correspondence relating to this protocol.

If you have any questions contact the ORS by phone at (512) 471-8871 or via e-mail at orsc@uts.cc.utexas.edu.

Sincerely,

James P. Wilson

James Wilson, Ph.D.
Institutional Review
Board Chair

Consent for Participation in a Research Study

You are being asked to participate in a research study. This form will provide you with information about the study. The principal investigator (the person in charge of this research study) or her representative will provide you with a copy of this form to keep for your reference, and will describe the study to you and answer any questions or address any concerns you may have regarding the study.
Please read the following information below and ask questions about anything that you do not understand before deciding to participate in the study. Your participation in this study is completely voluntary and you can refuse to participate without penalty or any loss of benefits to which you are entitled.

Title: Predictors of Disability in Middle-Aged and Older African American Women with Osteoarthritis

Introduction:
The purpose of this form is to provide you with information that may influence your decision as to whether or not to participate in this research study. The principal investigator or her representative will answer any of your questions. Please read the information below and ask questions you may have before deciding to participate in the study. If you decide to be involved in the study, you will receive a copy of this consent form.

Principal Investigator (PI) and The University of Texas at Austin Faculty Sponsor Information:
Janiece L. Walker, MSN, RN (PI) The University of Texas at Austin, School of Nursing, (512) 696-5131, and Dr. Tracie Harrison, PhD, RN, FNP (Faculty Sponsor), The University of Texas at Austin, School of Nursing, (512) 471-9085

Purpose of the Study: You have been asked to participate in a research study examining factors that predict or influence function and disability in African American women 50-80 years of age with osteoarthritis.

What will you be asked to do?:
If you agree to participate in this study, you will be asked to complete a questionnaire , which will include demographic information , information about your health care experiences and experiences with health care providers, and your access to health care. The questionnaire includes 259 questions. The questionnaire will be mailed to you and you will receive a stamped envelope to return the questionnaire back to the principal investigator. The study will include approximately 115-165 women.

What are the risks involved in this study?
There are no foreseeable risks involved in participating in this study. However, one possible risk may be that you may feel emotional distress or discomfort while completing the survey questions regarding your experiences with health care and providers. The PI will take necessary measures to ensure that your confidentiality is maintained. The PI will follow specific guidelines to ensure that your confidentiality is maintained. If you wish to discuss the information above or any other risks associated with the study you may contact the principal investigator listed on the first page of this form.

What are the possible benefits of this study?
You will receive no direct benefit from participating in this study, however, knowledge from this study may help improve disability outcomes in African American women with osteoarthritis.

Will there be compensation?
You will receive 50.00 in the form of either cash or a gift card upon completion of the questionnaire booklet.

What are my confidentiality or privacy protections when participating in this research study?
There will be no names or other identifying information used on collected data (completed questionnaires). Code numbers will be assigned to the data. The list that will link the individual names to the code numbers will be kept in a locked file cabinet that will be separate from the questionnaires. This list and the data will only be accessible to the principal investigator and the faculty sponsor listed on the first page of this consent form. No actual names will appear anywhere other than this informed consent document.

If you choose to participate in this study, the data resulting from your participation may be used for future research or may be made available to other researchers for research purposes not detailed in this consent form. You will have the option of receiving a copy of the final results of the study.

Whom to contact with questions about the study?
Before, during, and after completion of your participation in this study you can contact the principal investigator, Janiece Walker at 512-696-5131 or send an email to jl_walker@utexas.edu.

Whom to contact with questions concerning your rights as a research participant?
If you have questions regarding your rights or any concerns with this study, you can contact The University of Texas at Austin Institutional Review Board by

phone at (512)471-8871 or email at orsc@uts.cc.utexas.edu. You may contact the Institutional Review Board anonymously if you choose.

Signature

By signing this form you are acknowledging that you have been informed about this study's purpose, procedures, and possible risks and benefits, and you have received a copy of this form. You are also acknowledging that you have been provided with an opportunity to ask questions, before you have signed this document, and may continue to ask questions at any time during your participation in the study or after. By signing below you agree to voluntarily participate in this study. By signing this form, you are not waiving any of your legal rights.

____
Printed Name

____ ______________________
Signature Date

As a representative of this study, I have explained the purpose, procedures, benefits, and risks associated with this study.

____
Printed Name of Person obtaining consent

____ ______________________
Signature of Person obtaining consent Date

IRB USE ONLY
Study Number: 2012-11-0090 Approval Date: 12/17/2013 Expires: 01/16/2015

The Univeisity of Texas at Austin / School of Nursing

STUDY PARTICIPANTS NEEDED

Predictors of Disability in Middle Aged and Older African American Women with Osteoarthritis (OA)

Purpose: To identify factors that are related to disability in middle aged and older African American women with OA.

Must be:

- African American Woman
- Age 50 to 80 years
- Have osteoarthritis and difficulty with mobility
- Interested in filling out a questionnaire
- Live in Texas or New Mexico

Also need to have any difficulty or inability to do at least *two* of any of the following:

Do you have difficulty doing any of the following?

☐ Walk up 10 steps without resting

☐ Walking a quarter of a mile

☐ Standing for 20 minutes

☐ Bending down or stooping from a standing position

Participants will receive $50 (cash or gift card) once questionnaire is returned.

Please contact: Janiece Walker, MSN, RN
The University of Texas at Austin, School of Nursing
1710 Red River St, Austin, TX 78701
512-696-5131
JL_WALKER@UTEXAS.EDU

UT IRB Approval: 1/10/14

The Univeisity of Texas at Austin / School of Nursing

Appendix B

Predictors of Disability in African American Women with Osteoarthritis
Survey Booklet

Janiece L. Walker, MSN, RN
Doctoral Student
The University of Texas at Austin
School of Nursing
1710 Red River St.
Austin, TX 78712
Telephone: 512-696-5131/Toll Free 1-888-727-0211
Jl_walker@utexas.edu

Thank you so much for agreeing to participate in this study. Your participation will contribute to knowledge about disability outcomes in African American women. The questions in this booklet are designed to help understand what factors contribute to physical function and disability in middle-aged and older African American women with osteoarthritis. If possible please do not leave any answers blank that is a real loss to the study. If you do not wish to answer an item or have difficulty understanding an item please leave a note in the margin. You can also call the phone number listed on the cover of this booklet to ask any questions concerning this survey.

Please complete this survey booklet within two weeks if possible. If you get tired or distracted, it is best to take a break and return to it later. Please return the consent form and completed booklet using the enclosed envelope with appropriate postage already on it within the next 2 weeks. In order to maintain your confidentiality please do not write your name or any other identifying information in the survey booklet.

Demographics

1. What do you identify as your ethnicity? ____________________

2. What age are you? __________________

3. Are you currently
    a. Married
        i. How long? _______
    b. Divorced
        i. How long? _______
    c. Widowed
        i. How long?_______
    d. Never Married

4. How many years of education do you have? ________

5. What city and state do you live in? city_________
   state_____________

6. From the list below, what type of health insurance did you have the majority of time growing up?

    a. No insurance
    b. Private pay insurance
    c. Private pay insurance through my employer
    d. Medicare
    e. Medicaid
    f. I am not sure

7. From the list below, what type of health insurance did you have for the majority of the time from ages 21-49?
    a. No insurance
    b. Private pay insurance

    c. Private pay insurance through my employer
    d. Medicare
    e. Medicaid
    f. I am not sure

8. From the list below, what type of health insurance do you currently have?
    a. No insurance
    b. Private pay insurance
    c. Private pay insurance through my employer
    d. Medicare
    e. Medicaid
    f. I am not sure

9. What is your zip code?

10. What is your weight (in pounds)? _______

11. What is your height (in feet and inches)?________

12. Have you ever received a corticosteroid injection such as cortisone in any of your joints?

    a. If so when did you last receive the injection?

    b. Which joint did you receive it in?

13. Have you ever received a lubricant injection such as Hyalgan or Synvisc etc. in any of your joint?

    a. Is so when did you last receive the injection and which joint did you receive it in?

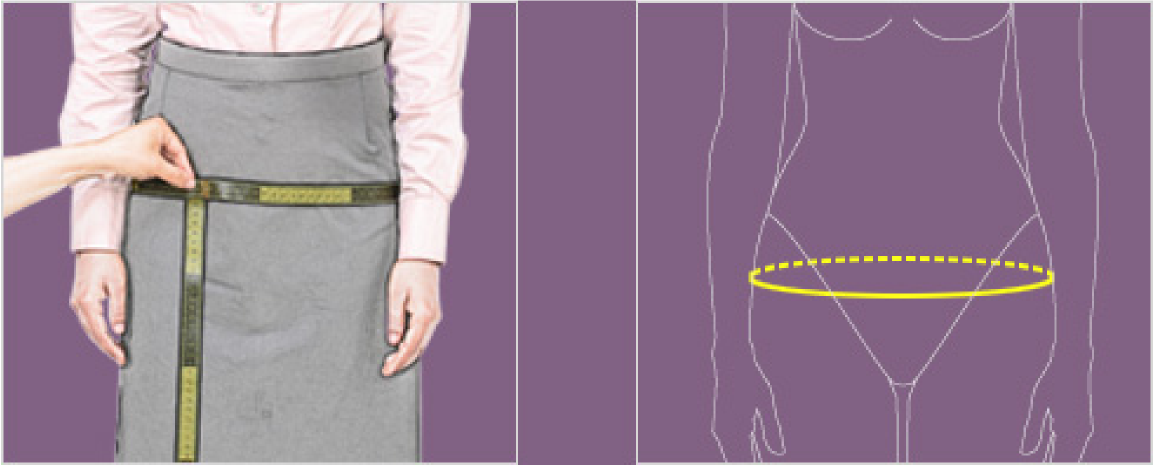
14. Have you ever had a joint replacement?

    a. If you have had a joint replacement which joint/joints did you have it in?

    b. When did you have the joint/joints replaced?

15. Please circle which of the following you take for pain
    a. Ibuprofen
    b. Tylenol (acetaminophen)
    c. Prescribed narcotic (hydrocodone, Vicodin, Percocet, oxycodone etc.)
    d. Prescribed non-narcotics (meloxicam etc.)
    e. None

16. In this packet a tape measurer has been included. For this question please use the tape measurer to measure the circumference of your hips in centimeters. You can measure your hips by placing the tape measurer around the widest part of your buttocks.



Write your hip circumference here________________

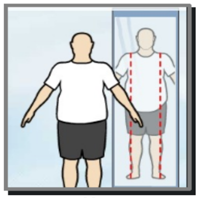
17. The following page has directions to measure your waist circumference. Please use the included tape measurer to measure your waist circumference and write here_____________________ waist circumference in centimeters.

Waist Circumference Measurement Guidelines—Self-Measurement

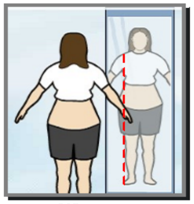
Step 1

Place yourself in the following manner:

- Stand in front of a mirror
- Ensure your abdomen is unrestricted and clear
- Feet shoulder-width apart



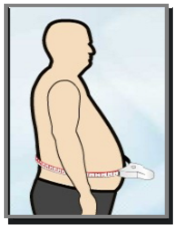
Man



Woman

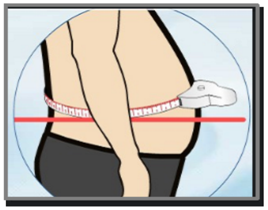
Step 2

- Wrap the measuring tape around your waist and insert the end of the tape into the appropriate slot.
- Locate the uppermost border of your hipbones (iliac crest) on your right-hand side.



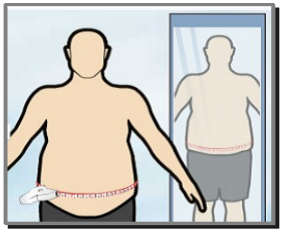
Step 3

- Align the bottom edge of the measuring tape with the top of your hipbones.



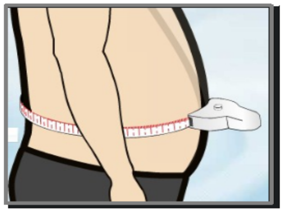
Step 4

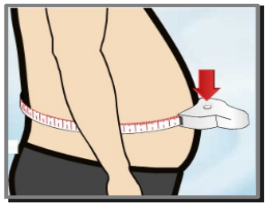
- With the help of a mirror, ensure that the tape is placed horizontally and wraps all around your abdomen.



Step 5

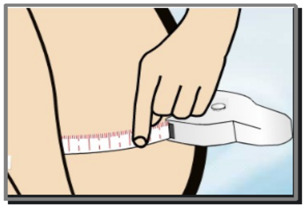
- Before taking the measurement, take 2-3 NORMAL breaths.
- At the end of the 3rd expiration, make a final adjustment by gently tightening the tape around your abdomen using the tape's central button.





Step 6

- Take the measurement at the end of a NORMAL expiration.
- Before removing the tape, pinch the end of the measuring tape with your fingers closest to your measurement and hold it in position.
- Note the result.



International Chair on Cardiometabolic Risk

myhealthywaist.org

Health Assessment Questionnaire

Please check the response that best describes your usual abilities over the last week

Are you able to?	Without ANY difficulty?	With SOME difficulty?	With MUCH difficulty?	Unable to do?
Dressing and Grooming				
Are you able to: dress yourself, including tying your shoelaces and doing buttons?				
Shampoo your hair?				
Arising				
Are you able to: Stand up straight from a chair?				
Get in and out of bed?				
Eating				
Are you able to: Cut your meat?				
Lift a full cup or glass to your mouth?				
Walking				
Are you able to: Walk				

outdoors on flat ground?				
Climb up five steps?				

Please check any AIDS OR DEVICES that you usually use for any of these activities:

________Cane ________Devices used for dressing (buttonhook, sipper, long-handled shoe, etc.

________Walker ________Built up or special utensils

________Wheelchair

________Crutches ________Special or built up chair

________Other (specify) ___________

________Crutches

Keep Going

Are you able to?	**Without ANY difficulty?**	**With SOME difficulty?**	**With MUCH difficulty?**	**Unable to do?**
Hygiene				
Are you able to: Wash and dry your body?				
Take a tub bath?				
Get on and off the toilet?				
Reach				
Are you able to: Reach and get down and get a 5-pound object (such as a bag of sugar) from just above your head?				
Bend down to pick up clothing from the floor?				
Grip				
Open car doors?				
Open jars, which have been				

previously opened?				
Turn faucets on and off?				
Are you able to?	**Without ANY difficulty?**	**With SOME difficulty?**	**With MUCH difficulty?**	**Unable to do?**
Activities				
Are you able to: Run errands and shop?				
Get in and out of a car?				
Do chores such as vacuuming or yard work?				

Please check any AIDS OR DEVICES that you usually use for any of these activities:

☐Raised toilet seat

☐Bathtub bar

☐Bathtub seat

☐Long-handled appliances for read

☐Jar opener (for jars previous opened)

☐Long-handled appliances in bathroom

☐Other (Specify ______________)

Please check any categories for which you usually need HELP FROM ANOTHER PERSON

☐Hygiene

☐Reach

☐Gripping and opening things

☐Errands and chores

Craig Handicap Assessment and Reporting Technique

WHAT ASSISTANCE DO YOU NEED?

People with disabilities often need assistance. We would like to differentiate between personal care for physical disabilities and supervision for cognitive problems. First, focus on physical "hands on" assistance: This includes help with eating, grooming, bathing, dressing, management of a ventilator or other equipment, transfers etc. Keeping in mind these daily activities...

Q1. How many hours in a typical 24-hour day do you have someone with you to provide physical assistance for personal care activities such as eating, bathing, dressing, toileting and mobility?

________ hours paid assistance
________ hours unpaid (family, others)

Q2. Not including any regular care as reported above, how many hours in a typical month do you occasionally have assistance with such things as grocery shopping, laundry, housekeeping, or infrequent medical needs because of the disability?

________ hours per month

Q3. Who takes responsibility for instructing and directing your attendants and/or caregivers?

_____ Self
_____ Someone Else
_____ Not applicable, does not use attendant care

Q4. How much time is someone with you in your home to assist you with activities that require remembering, decision-making, or judgment?

_______ Someone else is always with me to observe or supervise.

_______ Someone else is always around, but they only check on me now
and then.

_______ Sometimes I am left alone for an hour or two.

_______ Sometimes I am left alone for most of the day

_______ I have been left alone all day and all night, but someone checks in on me.

_______ I am left alone without anyone checking on me.

Q5. How much of the time is someone with you to help you with remembering, decision-making, or judgment when you go away from your home?

_______ I am restricted from leaving, even with someone else.
_______ Someone is always with me to help with remembering, decision making or judgment when I

go anywhere.
_______ I go to places on my own as long as they are familiar.
_______ I do not need help going anywhere.

Q6. How often do you have difficulty communicating with other people?
_______ I almost always have difficulty.
_______ I sometimes have difficulty.
_______ I almost never have difficulty.

Q7. How often do you have difficulty remembering important things that you must do?
_______ I almost always have difficulty.
_______ Sometimes I have difficulty.
_______ I almost never have difficulty

Q8. How much of your money do you control?
_______ None, someone makes all money decisions for me.
_______ A small amount of spending money is given to me periodically.
_______ Most of my money, but someone does help me make major decisions.
_______ I make all my own money decisions (or if married, in joint participation with my partner).

Now, I have a series of questions about your typical activities.

Q9. On a typical day, how many hours are you out of bed?
________hours

Q10. In a typical week, how many days do you get out of your house and go somewhere? ____days

Q11. In the last year, how many nights have you spent away from your home (excluding hospitalizations?)

______ none
_______ 1-2
_______ 3-4
_______ 5 or more

Q12. Can you enter and exit your home without any assistance from someone?

_____ yes
_____ no

Q13. In your home, do you have independent access to your sleeping area, kitchen, bathroom, telephone, and TV (or radio)?

______ yes
______ no

Q14. Can you use your transportation independently?

______ yes
______ no

Q15. Does your transportation allow you to get to all the places you would like to go?

______ yes
______ no

Q16. Does your transportation let you get out whenever you want?

______ yes
______ no

Q17. Can you use your transportation with little or no advance notice?

______ yes
______ no

Q18. How many hours per week do you spend working in a job for which you get paid? ________ hours

Q19. How many hours per week do you spend in school working toward a degree or in an accredited technical training program (including hours in class and studying?) ________hours

Q20. How many hours per week do you spend in active homemaking including parenting, housekeeping, and food preparation?
_________hours

Q21. How many hours per week do you spend in home maintenance activities such as gardening, house repairs or home improvement?
_________hours

Q22. How many hours per week do you spend in ongoing volunteer work for an organization? _________hours

Q23. How many hours per week do you spend in recreational activities such as sports, exercise, playing cards, or going to movies? Please do not include time spent watching TV or listening to the radio. ________ hours

Q24. How many hours per week do you spend in other self-improvement activities, such as hobbies or leisure reading? Please do not include time spent watching TV or listening to the radio? _______ hours

Q25. Do you live alone?

1. Yes
2. No

Q26. (If you don't live alone) do you live with a spouse or significant other?

1. Yes
2. No

Q27. How many children do you live with?________

Q28. How many other relatives do you live with? _________

Q29. How many roommates do you live with? _________

Q30. How many attendants do you live with? _________

Q31. If you don't live with a spouse or significant other) are you involved in a romantic relationship?

1. Yes
2. No

N/A (Live with spouse or significant other)

Q32. How many relatives (not in your household) do you visit, phone, or write to at least once a month?

_________ relatives

Q33. How many business or organizational associates do you visit, phone, or write to at least once a month?

___________ associates

Q34. How many friends (non-relatives contacted outside business or organizational settings) do you visit, phone, or write to at least once a month?

__________friends

Q35. With how many strangers have you initiated a conversation in the last month (for example, to ask information or place an order)?

______ none
_______ 1-2
_______3-4
_______5 or more

Q36. Approximately what was the combined annual income, in the last year, of all family members in your household? (consider all sources including wages and earnings, disability benefits, pensions and retirement income, income from court settlements, investments and trust funds, child support and alimony, contributions from relatives, and any other source.)

__________________________$.

Q37. Approximately how much did you pay last year for medical care expenses? (Consider any amounts paid by yourself or the family members in your household and not reimbursed by insurance or benefits.)

__________________________$.

Health Care Utilization

Please write the appropriate number of visits or times after each question

1. **In the past 6 months**, how many times did you visit a physician? *(Do **NOT** include visits while in the hospital or the hospital emergency room*).___________ visits

2. **In the past 6 months**, how many times did you go to a **hospital** emergency room?__________ times

3. How many different **times** did you stay in a hospital overnight or longer **in the past 6 months**?__________ times

4. How many total NIGHTS did you spend in the hospital **in the past 6 months**?__________ nights

Trust in Providers Scale

***Please circle the best answer on how you feel about interactions with your primary health care provider*.**

Q1. I doubt that my health care provider really cares about me as a person.

1. Strongly Disagree
2. Disagree
3. Neither Agree or Disagree
4. Agree
5. Strongly Agree

Q2. My health care provider is usually considerate of my needs and puts them first.

1. Strongly Disagree
2. Disagree
3. Neither Agree or Disagree
4. Agree
5. Strongly Agree

Q3. I trust my health care provider so much I always try to follow his/her advice.

1. Strongly Disagree
2. Disagree
3. Neither Agree or Disagree
4. Agree
5. Strongly Agree

Q4. If my health care provider tells me something is so, then it must be true.

1. Strongly Disagree
2. Disagree
3. Neither Agree or Disagree

4. Agree
5. Strongly Agree

Q5. I sometimes distrust my health care provider's opinion and would like a second one.

1. Strongly Disagree
2. Disagree
3. Neither Agree or Disagree
4. Agree
5. Strongly Agree

Q6. I trust my health care provider's judgments about my medical care.

1. Strongly Disagree
2. Disagree
3. Neither Agree or Disagree
4. Agree
5. Strongly Agree

Q7. I feel my health care provider does not do everything he/she should for my medical care.

1. Strongly Disagree
2. Disagree
3. Neither Agree or Disagree
4. Agree
5. Strongly Agree

Q8. I trust my doctor to put my medical needs above all other considerations when treating my medical problems.

1. Strongly Disagree
2. Disagree

3. Neither Agree or Disagree
4. Agree
5. Strongly Agree

Q9. My health care provider is a real expert in taking care of medical problems like mine.

1. Strongly Disagree
2. Disagree
3. Neither Agree or Disagree
4. Agree
5. Strongly Agree

Q10. I trust my health care provider to tell me if a mistake was made about my treatment.

1. Strongly Disagree
2. Disagree
3. Neither Agree or Disagree
4. Agree
5. Strongly Agree

Q11. Sometimes I worry that my health care provider may not keep the information we discuss totally private.

1. Strongly Disagree
2. Disagree
3. Neither Agree or Disagree

4. Agree
5. Strongly Agree

Short Form McGill Pain Questionnaire
PLEASE DESCRIBE YOUR PAIN DURING THE LAST WEEK. *(Check off one box per line.)*

	None	Mild	Moderate	Severe
1. Throbbing	0 ☐	1 ☐	2 ☐	3 ☐
2. Shooting	0 ☐	1 ☐	2 ☐	3 ☐
3. Stabbing	0 ☐	1 ☐	2 ☐	3 ☐
4. Sharp	0 ☐	1 ☐	2 ☐	3 ☐
5. Cramping	0 ☐	1 ☐	2 ☐	3 ☐
6. Gnawing	0 ☐	1 ☐	2 ☐	3 ☐
7. Hot-burning	0 ☐	1 ☐	2 ☐	3 ☐
8. Aching	0 ☐	1 ☐	2 ☐	3 ☐
9. Heavy (like a weight)	0 ☐	1 ☐	2 ☐	3 ☐
10. Tender	0 ☐	1 ☐	2 ☐	3 ☐
11. Splitting	0 ☐	1 ☐	2 ☐	3 ☐
12. Tiring-Exhausting	0 ☐	1 ☐	2 ☐	3 ☐
13. Sickening	0 ☐	1 ☐	2 ☐	3 ☐
14. Fear-causing	0 ☐	1 ☐	2 ☐	3 ☐
15. Punishing-Cruel	0 ☐	1 ☐	2 ☐	3 ☐

PLEASE RATE YOUR PAIN DURING THE LAST WEEK.

The following line represents pain of increasing intensity from “no pain” to “worst possible pain”. Place a vertical mark (|) across the line in the position that best describes your pain **during the last week.**

No pain **Worst possible pain**

CURRENT PAIN INTENSITY

0 ☐ No pain
1 ☐ Mild
2 ☐ Discomforting 3 ☐ Distressing
4 ☐ Horrible
5 ☐ Excruciating

If you need a break, stop for a while and finish later

SOPA—35(Due to copyright restrictions the SOPA instrument could not be included in entirety)

Please indicate how much you agree with each of the following statements about your pain problem by using response key below.

Untrue for me	This is somewhat untrue for me	This is neither true nor untrue for me (or it does not apply to me)	This is somewhat true for me	This is very true for me
0	1	2	3	4

1. The pain I feel is a sign that damage is being done	**0 1 2 3 4**
10. There is little that I can do to ease my pain	**0 1 2 3 4**
34. Exercise can decrease the amount of pain I experience.	**0 1 2 3 4**

CESD-R

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the past week (check one response on each line)

During the past week…	**Rarely or none of the time (less than one day)**	**Some or a little of the time (1-2 days)**	**Occasionally or a moderate amount of the time (3-4 days)**	**All of the time (5-7 days)**
I was bothered by things that usually don’t bother me.				
I did not feel like eating; my appetite was poor				
I felt that I could not shake off the blues even with help from my family or friends.				
I felt I was just as good as other people.				
I had trouble keeping my mind on what I was doing.				
I felt depressed				

During the past week…	**Rarely or none of the time (less than one day)**	**Some or a little of the time (1-2 days)**	**Occasionally or a moderate amount of the time (3-4 days)**	**All of the time (5-7 days)**
I felt that everything I did was an effort.				
I felt hopeful about the future.				
I thought my life had been a failure.				
I felt fearful.				
My sleep was restless.				
I was happy.				
I talked less than usual.				
I felt lonely.				
People were unfriendly.				
I enjoyed life.				
I had crying spells.				
I felt sad				
I felt that people disliked me.				
I could not get “going”.				

The General Ethnic Discrimination Scale

We are interested in your experiences with racism. As you answer the questions below, please think about the past year first, and your ENTIRE LIFE, from when you were a child to the present. For each question, please circle the number that best captures the things that have happened to you.

1. How often have you been treated unfairly by teachers and professors because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

2. How often have you been treated unfairly by your employers, bosses, and supervisors because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

3. How often have you been treated unfairly by your co-workers, fellow students, and colleagues because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?						
	1	2	3	4	5	6

4. How often have you been treated unfairly by people in service jobs (by store clerks, waiters, bartenders, bank tellers and others) because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
	1	2	3	4	5	6
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?						
	1	2	3	4	5	6

5. How often have you been treated unfairly by strangers because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6

	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

6. How often have you been treated unfairly by people in helping jobs (by doctors, nurses, psychiatrists, case workers, dentists, school counselors, therapists, social workers and others) because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6

	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

7. How often have you been treated unfairly by neighbors because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

8. How often have you been treated unfairly by institutions (schools, universities, law firms, the police, the courts, the Department of Social Services, the Unemployment Office and others) because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

9. How often have you been treated unfairly by people that you thought were your friends because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

10. How often have you been accused or suspected of doing something wrong (such as stealing, cheating, not doing your share of work, or breaking the law) because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

11. How often have people misunderstood your intentions and motives because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6

	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

12. How often did you want to tell someone off for being racist but didn’t say anything?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6

	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

13. How often have you been really angry about something racist that was done to you?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6

	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

14. How often have you been forced to take drastic steps (such as filing a grievance, filing a lawsuit, quitting your job, moving away, and other actions) to deal with some racist thing that was done to you?

	Never	Once in a while	Sometimes	A lot	Most of the t	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6

	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

15. How often have you been called a racist name?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

16. How often have you gotten into an argument or a fight about something racist that was done to you or done to another member of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

17. How often have you been made fun of, picked on, pushed, shoved, hit, or threatened with harm because of your race/ethnic group?

	Never	Once in a while	Sometimes	A lot	Most of the time	Almost all the time
How often in the past year?	1	2	3	4	5	6
How often in your entire life?	1	2	3	4	5	6
	Not at all					Extremely
How stressful was this for you?	1	2	3	4	5	6

18. How *different* would your life be now if you *HAD NOT BEEN* treated in a racist and unfair way?

	The same as it is now	A little different	Different in a few ways	Different in a lot of ways	Different in most ways	Totally different
In the past year?	1	2	3	4	5	6
In your entire life?	1	2	3	4	5	6

Health Care Providers and Systems Questionnaire
Health Care Access Supplement

Q1. Can you make appointments at this provider’s office by e-mail or on a website?

1. Yes
2. No
3. Don’t know --→ If don’t know, go to question 9

Q2. In the last 12 months, did you use e-mail or a website to make an appointment at this provider’s office?

1. Yes
2. No
3. Don’t know --→ If don’t know, go to question 9

Q3. In the last 12 months, when you used e-mail or a website to get an appointment at this provider’s office, how often did you get an appointment as soon as you needed?

1. Never
2. Sometimes
3. Usually
4. Always

Q4. In the last 12 months, did you e-mail this provider’s office with a medical question?

1. Yes
2. No
3. Don’t know --→ If don’t know, go to question 13

Q5. In the last 12 months, when you e-mailed this provider’s office, how often did you get an answer to your medical question as soon as you needed?

1. Never
2. Sometimes
3. Usually
4. Always

Q6. In the last 12 months, when you e-mailed this provider's office, how often were all of the questions in your e-mail answered?

1. Never
2. Sometimes
3. Usually
4. Always

Q7. Providers may use computers or handheld devices during an office visit to do things like look up your information or order prescription medicines. In the last 12 months, did this provider use a computer or handheld device during any of your visits?

1. Yes
2. No
3. Don't know

Q8. During your visits in the last 12 months, did this provider ever use a computer or handheld device to look up test results or other information about you?

1. Yes
2. No
3. Don't know --→ If don't know, go to question 13

Q9. During your visits in the last 12 months, did this provider ever use a computer or handheld device to show you information?

1. Yes
2. No

Q10. In the last 12 months, did this provider ever use a computer or a handheld device to order your prescription medicines?

1. Yes
2. No
3. Don't know

Q11. During your visits in the last 12 months, was this provider’s use of a computer or handheld device helpful to you?

1. Yes, definitely
2. Yes, somewhat
3. No

Q12. During your visits in the last 12 months, did this provider’s use of a computer or handheld device make it harder or easier for you to talk with him or her?

1. Harder
2. Not harder or easier
3. Easier

Q13. Does this provider’s office put your laboratory or other test results on a website for you to see?

1. Yes
2. No (If no go to question 18)
3. Don’t Know (If you don’t know go to question 18)

Q14. In the last 12 months, did you look for your lab or other test results on the website?

1. Yes
2. No (If no go to question 18)

Q15. In the last 12 months, how often was it easy to find these lab or other test results on the website?

1. Never
2. Sometimes
3. Usually
4. Always

Q16. In the last 12 months, how often were these lab or other test results put on the website as soon as you needed them?

1. Never
2. Sometimes
3.Usually
4. Always

Q17. In the last 12 months, how often were these lab or other test results presented in a way that was easy to understand?

1. Never
2. Sometimes
3.Usually
4. Always

Q18. Visit notes sum up what was talked about on a visit to a provider's office. Visit notes may be available on paper, on a website, or by e-mail. In the last 12 months, did this provider's office offer you visit?

1. Never (If never then skip to question 22)
2. Sometimes
3. Usually
4. Always

Q19. In the last 12 months, how did this provider's office offer you the visit notes? Mark one or more.

1. On paper
2. On a website
3. By e-mail
4. Some other way

Q20. In the last 12 months, did you look at any visit notes from this provider's office?

1. Yes
2. No (If no then go to question 22)

Q21. In the last 12 months, how often were the visit notes easy to understand?

1. Never
2. Sometimes

3. Usually
4. Always

Q22. In the last 12 months, how many days did you usually have to wait for an appointment when you needed care right away?

1. Same day
2. 1 day
3. 2-3 days
4. 4-7 days
5. More than 7 days

Q23. Did the provider's office give you information about what to do if you needed care during evening, weekends, or holidays?

1. Yes
2. No

Q24. In the last 12 months, did you need care for yourself during evenings, weekends, or holidays?

1. Yes

2 No (If no go to question 26)

Q25. In the last 12 months, how often were you able to get the care you needed from this provider's office during evenings, weekends, or holidays?

1. Never
2. Sometimes
3. Usually
4. Always

Q26. Some offices remind patients between visits about tests, treatment or appointments. In the last 12 months, did you get any reminders from this provider's office between visits?

1.Yes

2. No

Q27. In the last 12 months, did you and this provider talk about starting or stopping a prescription medication?

1. Yes
2. No (If no go to question 30)

Q28. When you talked about starting or stopping a prescription medicine, how much did this provider talk about the reasons you might want to take a medicine?

1. Not at all
2. A little
3. Some
4. A lot

Q29. When you talked about starting or stopping a prescription medicine, did this provider ask you what you thought was best for you?

1. Yes
2. No

Q30. Specialists are doctors like surgeons, heart doctors, allergy doctors, skin doctors, and other doctors who specialize in one area of health care. In the last 12 months, did you see a specialist for a particular health problem?

1. Yes
2. No

Q31. In the last 12 months, how often did the provider named in question 1 seem informed and up-to-date about the care you got from specialists?

1. Never
2. Sometimes
3. Usually
4. Always

Q32. In the last 12 months, did anyone in this provider's office talk with you about specific goals for your health?

1. Yes
2. No

Q33. In the last 12 months, did anyone in this provider's office as you if there are things that make it hard for you to take care of your health?

1. Yes
2. No

Q34. In the last 12 months, did you take any prescription medicine?

1. Yes
2. No (If no skip to question 36)

Q35. In the last 12 months did you and anyone in this provider's office talk at each visit about all the prescription medicines you were taking?

1. Yes
2. No

Q36. In the last 12 months, did anyone in this provider's office ask you if there was a period of time when you felt sad, empty, or depressed?

1. Yes
2. No

Q37. In the last 12 months, did you and anyone in this provider's office talk about things in your life that worry you or cause you to stress?

1. Yes
2. No

Q38. In the last 12 months, did you and anyone in this provider's office talk about a personal problem, family problems, alcohol use, drug use, or mental or emotional illness?

1. Yes
2. No

1.What is your approximate yearly income:

a. Less than 10, 000
b. 10,000-15,000
c. 15,001-20,000
d. 20,001-25,000
e. 25,001-35,000
f. 35,001-50,000
g. 50,001-75,000
h. Greater than 75,000

2. Approximately how long have you had osteoarthritis?

3.Is there any thing you would like me to know that was not included on this survey?

4.Would you like results of this study?

Yes No

5.May I contact you for future studies?

Yes No

Congratulations you have completed the study. Thank you so much for participating in this study. Please mail this booklet back using the addressed envelop with attached postage. Once the booklet and consent form are received you will receive your $50.00 gift card or $50 cash.

References

Agency for Healthcare Research and Quality. (2013). Addressing racial and ethnic disparities in health care. Retrieved from http://www.ahrq.gov/research/findings/factsheets/minority/disparit/

Agrawal, V., Jaar, B. G., Frisby, X. Y., Chen, S. C., Qiu, Y., Li, S., . . . Bomback, A. S. (2012). Access to health care among adults evaluated for CKD: Findings from the Kidney Early Evaluation Program (KEEP). *American Journal of Kidney Disease*, *59*(3), 5-15. doi:10.1053/j.ajkd.2011.10.043

Allen, K. D. (2010). Racial and ethnic disparities in osteoarthritis phenotypes. *Current Opinion in Rheumatology*, *22*(5), 528-532. doi:10.1097/BOR.0b013e32833b1b6f

Allen, K. D., Chen, J. C., Callahan, L. F., Golightly, Y. M., Helmick, C. G., Renner, J. B., . . . Jordan, J. M. (2012). Racial differences in knee osteoarthritis pain: potential contribution of occupational and household tasks. *Journal of Rheumatology*, *39*(2), 337-344. doi:10.3899/jrheum.110040

Allen, K. D., Helmick, C. G., Schwartz, T. A., DeVellis, R. F., Renner, J. B., & Jordan, J. M. (2009). Racial differences in self-reported pain and function among individuals with radiographic hip and knee osteoarthritis: The Johnston County Osteoarthritis Project. *Osteoarthritis and Cartilage*, *17*(9), 1132-1136.

Allen, K. D., Oddone, E. Z., Coffman, C. J., Keefe, F. J., Lindquist, J. H., & Bosworth, H. B. (2010). Racial differences in osteoarthritis pain and function: Potential explanatory factors. *Osteoarthritis and Cartilage*, *18*(2), 160-167. doi:10.1016/j.joca.2009.09.010

Al Snih, S., Ottenbacher, K. J., Markides, K. S., Kuo, Y. F., Eschbach, K., & Goodwin, J. S. (2007). The effect of obesity on disability vs. mortality in older Americans. *Archives of Internal Medicine*, *167*(8), 774.

American College of Surgeons: Division of Advocacy and Health Policy. (2012). *About CAHPS*. Retrieved from http://www.facs.org/ahp/cahps/about-cahps.html

Anderson, L. A., & Dedrick, R. F. (1990). Development of the Trust in Physician scale: a measure to assess interpersonal trust in patient-physician relationships. *Psychological Reports, 67*, 1091-1100.

Andresen, E. M., & Brownson, R. C. (2000). Disability and health status: Ethnic differences among women in the United States. *Journal of Epidemiology & Community Health*, *54*(3), 200-206.

Appelt, C. J., Burant, C. J., Siminoff, L. A., Kwoh, C. K., & Ibrahim, S. A. (2007). Arthritis-specific health beliefs related to aging among older male patients with knee and/or hip osteoarthritis. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *62*(2), 184-190.

Aroian, K. J., Vander, W. J., Peters, R. M., & Tate, N. (2007). Consumer dissatisfaction, self-treatment, and health service use in low income African American and white older persons. *Journal of Cultural Diversity*, *14*(2), 61-67.

Arthritis Foundation (2013). *Osteoarthritis*. Retrieved from http://www.arthritis.org/conditions-treatments/disease-center/osteoarthritis/

Atdjian, S., & Vega, W. A. (2005). Disparities in mental health treatment in U.S. racial and ethnic minority groups: Implications for psychiatrists. *Psychiatric Services, 56*(12), 1600-1602. doi:10.1176/appi.ps.56.12.1600

Ayotte, B. J., Allaire, J. C., & Whitfield, K. E. (2013). Social support, physical functioning, and cognitive functioning among older African American adults. *Aging, neuropsychology and cognition, 20*(4), 494-510. doi:10.1080/13825585.2012.761669

Baker, T. A., Buchanan, N. T., & Corson, N. (2008). Factors influencing chronic pain intensity in older black women: Examining depression, locus of control, and physical health. *Journal of Women's Health, 17*(5), 869-878.

Baker, T. A., & Whitfield, K. E. (2006). Physical functioning in older blacks: An exploratory study identifying psychosocial and clinical predictors. *Journal of the National Medical Association*, *98*(7), 1114-1120.

Barksdale, D. J., Farrug, E. R., & Harkness, K. (2009). Racial discrimination and blood pressure: Perceptions, emotions, and behaviors of black American adults. *Issues in Mental Health Nursing, 30*(2), 104-111. doi:10.1080/01612840802597879

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182.

Becker, G., Gates, R. J., & Newsom, E. (2004). Self-care among chronically ill African Americans: Culture, health disparities, and health insurance status. *American Journal of Public Health*, *94*(12), 2066-2073.

Bediako, S. M., Lavender, A. R., & Yasin, Z. (2007). Racial centrality and health care use among African American adults with sickle cell disease. *Journal of Black Psychology*, *33*(4), 422-438. doi: 1**0.1177/0095798407307044**

Bell, R. A., Arcury, T. A., Ip, E., Grzywacz, J. G., Nguyen, H., Kirk, J. K., . . . Quandt, S. A. (2013). Correlates of physician trust among rural older adults with diabetes. *American Journal of Health Behavior, 37*(5), 660-666. doi:10.5993/ajhb.37.5.10

Benkert, R., Peters, R., Tate, N., & Dinardo, E. (2008). Trust of nurse practitioners and physicians among African Americans with hypertension. *Journal of Academic Nursing Practice*, *20*(5), 273-280. doi:10.1111/j.1745-7599.2008.00317.x

Bennett, J. A. (2000). Focus on research methods-mediator and moderator variables in nursing research: Conceptual and statistical differences. *Research in Nursing and Health*, *23*(5), 415.

Bernstein, A. B., Hing, E., Moss, A. J., Allen, K. F., Siller, A. B., & Tiggle, R. B. (2003) *Health care in America: Trends in utilization*. Retrieved from The National Center for Health Statistics web site: http://www.cdc.gov/nchs/data/misc/healthcare.pdf.

Bharmal, M., & Thomas, J. (2005). Health insurance coverage and health-related quality of life: Analysis of 2000 Medical Expenditure Panel Survey data. *Journal of*

Health Care for the Poor and Underserved, *16*(4), 643-654. doi:10.1353/hpu.2005.0064

Black, S.A., & Rush, R.D. (2002). Cognitive and functional decline in adults aged 75 and older. *Journal of the American Geriatrics Society*, *50*(12), 1978-1986.

Blank, R. M., Dabady, M., & Citro, C. F. (Eds.). (2004). *Measuring racial discrimination*. Washington, DC: National Academies Press.

Bolen, J., Schieb, L., Hootman, J. M., Helmick, C. G., Theis, K., Murphy, L. B, & Langmaid, G. (2010). Differences in the prevalence and severity of arthritis among racial/ethnic groups in the United States, National Health Interview Survey, 2002, 2003, and 2006. *Preventing Chronic Disease*, *7*(3), A64.

Börkan, B. (2010). The mode effect in mixed-mode surveys: Mail and web surveys. *Social Science Computer Review*, *28*(3), 371-380. doi:10.1177/0894439309350698

Borrell, L. N., Jacobs, D. R., Williams, D. R., Pletcher, M. J., Houston, T. K., & Kiefe, C. I. (2007). Self-reported racial discrimination and substance use in the Coronary Artery Risk Development in Adults study. *American Journal of Epidemiology*, *166*(9), 1068-1079.

Borrell, L. N., Kiefe, C. I., Williams, D. R., Diez-Roux, A. V., & Gordon-Larsen, P. (2006). Self-reported health, perceived racial discrimination, and skin color in African Americans in the CARDIA study. *Social Science & Medicine*, *63*(6), 1415-1427. doi:10.1016/j.socscimed.2006.04.008

Boulware, L. E., Cooper, L. A., Ratner, L. E., LaVeist, T. A., & Powe, N. R. (2003). Race and trust in the health care system. *Public Health Reports*, *118*(4), 366-370.

Brooks, P. M. (2002). Impact of osteoarthritis on individuals and society: How much disability? Social consequences and health economic implications. *Current Opinion in Rheumatology*, *14*(5), 573-577.

Brown, C., Bromberger, J. T., Schott, L. L., Crawford, S., & Matthews, K. A. (in press). Persistence of depression in African American and Caucasian women at midlife:

Findings from the Study of Women Across the Nation (SWAN). *Archives of Women's Mental Health*. doi:10.1007/s00737-014-0444-5

Bruce, B., Fries, J. F., & Murtagh, K. N. (2007). Health status disparities in ethnic minority patients with rheumatoid arthritis: A cross-sectional study. *Journal of Rheumatology, 34*(7), 1475-1479.

Bruce, B., & Fries, J. (2004). Longitudinal comparison of the Health Assessment Questionnaire (HAQ) and the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). *Arthritis Care & Research*, *51*(5), 730-737. doi: 10.1002/art.20695

Bruce, T. O. (2008). Comorbid depression in rheumatoid arthritis: Pathophysiology and clinical implications. *Current Psychiatry Reports*, *10*(3), 258-264.

Burgess, D. J., Grill, J., Noorbaloochi, S., Griffin, J. M., Ricards, J., van Ryn, M., & Partin, M. R. (2009). The effect of perceived racial discrimination on bodily pain among older African American men. *Pain Medicine, 10*(8), 1341-1352. doi:10.1111/j.1526-4637.2009.00742.x

Burns, R., Graney, M. J., Lummus, A. C., Nichols, L. O., & Martindale-Adams, J. (2007). Differences of self-reported osteoarthritis disability and race. *Journal of the National Medical Association*, *99*(9), 1046-1051.

Byrne, M., Troy, A., Bradley, L. A., Marchisello, P. J., Geisinger, K. F., Van der Heide, L. H., & Prieto, E. J. (1982). Cross-validation of the factor structure of the McGill Pain Questionnaire. *Pain*, *13*(2), 193-201.

Cano, A., Leong, L., Heller, J. B., & Lutz, J. R. (2009). Perceived entitlement to pain-related support and pain catastrophizing: Associations with perceived and observed support. *Pain*, *141*(1-3), 249-254. doi:10.1016/j.pain.2009.09.023

Cano, A., Mayo, A., & Ventimiglia, M. (2006). Coping, pain severity, interference, and disability: The potential mediating and moderating roles of race and education. *Journal of Pain*, *7*(7), 459-468.

Carson, A. P., Holmes, D. N., & Howard, D. L. (2010). Weight change and functional limitations among older adults in North Carolina. *Journal of Community Health, 35*(6), 586-591. doi:10.1007/s10900-010-9245-6

Casagrande, S. S., Gary, T. L., LaVeist, T. A., Gaskin, D. J., & Cooper, L. A. (2006). Perceived discrimination and adherence to medical care in a racially integrated community. *Journal of General Internal Medicine*, *22*, 389-395.

Caterinicchio, R. P. (1979). Testing plausible path models of interpersonal trust in patient-physician treatment relationships. *Social Science & Medicine. Part A: Medical Psychology & Medical Sociology*, *13*, 81-99.

Centers for Disease Control and Prevention. (2009). National Health Interview Survey on Disability. Retrieved from http://www.cdc.gov/nchs/nhis/nhis_disability.htm

Centers for Disease Control and Prevention (2011a). About BMI for adults. Retrieved from http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html#Interpreted

Centers for Disease Control and Prevention. (2011b). *Osteoarthritis*. Retrieved from http://www.cdc.gov/arthritis/basics/osteoarthritis.htm

Centers for Disease Control and Prevention. (2011c). *Women with disabilities*. Retrieved from http://www.cdc.gov/ncbddd/disabilityandhealth/women.html

Chae, D. H., Lincoln, K. D., Adler, N. E., & Syme, S. L. (2010). Do experiences of racial discrimination predict cardiovascular disease among African American men? The moderating role of internalized negative racial group attitudes. *Social Science & Medicine, 71*(6), 1182-1188. doi:10.1016/j.socscimed.2010.05.045

Chin, M. H., Zhang, J. X., & Merrell, K. (1998). Diabetes in the African-American Medicare population: Morbidity, quality of care, and resource utilization. *Diabetes Care, 21*(7), 1090-1095.

Clark, D. O., Mungai, S. M., Stump, T. E., & Wolinsky, F. D. (1997). Prevalence and impact of risk factors for lower body difficulty among Mexican Americans, African Americans, and Whites. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *52*(2), M97-M105.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*(4), 385-396.

Colbert, C. J., Almagor, O., Chmiel, J. S., Song, J., Dunlop, D., Hayes, K. W., & Sharma, L. (2013). Excess body weight and four-year function outcomes: Comparison of African Americans and whites in a prospective study of osteoarthritis. *Arthritis Care Research*, *65*(1), 5-14. doi:10.1002/acr.21811

Coogan, P. F., Yu, J., O'Connor, G. T., Brown, T. A., Cozier, Y. C., Palmer, J. R., & Rosenberg, L. (2014). Experiences of racism and the incidence of adult-onset asthma in the Black Women's Health Study. *CHEST*, *145*(3), 480-485. doi:10.1378/chest.13-0665

Copeland, V. C. (2005). African Americans: Disparities in health care access and utilization. *Health and Social Work*, *30*(3), 265-270.

Craig, B. M., & Adams, A. K. (2009). Accuracy of body mass index categories based on self-reported height and weight among women in the United States. *Maternal and Child Health Journa*l, *13*(4), 489-496.

Creamer, P, Lethbridge‐ Cejku, M., & Hochberg, M. C. (2000). Factors associated with functional impairment in symptomatic knee osteoarthritis. *Rheumatology*, *39*(5), 490-496.

Cruz-Almeida, Y., Sibille, K. T., Goodin, B. R., Petrov, M. E., Bartley, E. J., Riley, J. L., III, . . . Fillingim, R. B. (2014). Racial and ethnic differences in older adults with knee osteoarthritis. *Arthritis & Rheumatology, 66*(7), 1800-1810. doi:10.1002/art.38620

Dannefer, D., & Sell, R. R. (1988). Age structure, the life course and" aged heterogeneity": prospects for research and theory. Comprehensive Gerontology. *Section B, Behavioral, Social, and Applied Sciences*, *2*(1), 1-10.

Day, M. A., & Thorn, B. E. (2010). The relationship of demographic and psychosocial variables to pain-related outcomes in a rural chronic pain population. *Pain*, *151*(2), 467-474. doi:10.1016/j.pain.2010.08.015

DeVellis, R. F. (2012). *Scale development: Theory and applications* (Vol. 26). Los Angeles, CA: Sage.

Dickens, C., & Creed, F. (2001). The burden of depression in patients with rheumatoid arthritis. *Rheumatology*, *40*(12), 1327-1330.

Dillman, D. A. (2007). *Mail and internet surveys: The Tailored Design Method–2007. Update with New Internet, Visual, and Mixed-Mode Guide*. Hoboken: NJ: Wiley.

Dillman, D. A., Sangster, R. L., Tarnai, J., & Rockwood, T. H. (1996). Understanding differences in people's answers to telephone and mail surveys. *New Directions for Evaluation*, *1996*(70), 45-61.

Dobalian, A., & Rivers, P. A. (2008). Racial and ethnic disparities in the use of mental health services. *Journal of Behavioral Health Services and Research*, *35*(2), 128-141. doi:10.1007/s11414-007-9097-8

Dominick, K. L., Ahern, F. M., Gold, C. H., & Heller, D. A. (2004). Health-related quality of life among older adults with arthritis. *Health and Quality of life Outcomes*, *2*(1), 5.

Dudgeon, D., Raubertas, R. F., & Rosenthal, S. N. (1993). The short-form McGill Pain Questionnaire in chronic cancer pain. *Journal of Pain Symptom Management*, *8*(4), 191-195.

Dunlop, D. D., Manheim, L. M., Song, J., & Chang, R.W. (2002). Gender and ethnic/racial disparities in health care utilization among older adults. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *57*(4), S221-S233.

Dunlop, D. D., Semanik, P., Song, J., Manheim, L. M., Shih, V., & Chang, R. W. (2005). Risk factors for functional decline in older adults with arthritis. *Arthritis & Rheumatism*, *52*(4), 1274-1282.

Eaton, W. W., Smith, C., Ybarra, M., Muntaner, C., & Tien, A. (2004). Center for Epidemiologic Studies Depression Scale: Review and revision (CESD and CESD-R). In M. E. Maurish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (3rd ed., pp. 363-377). Mahwah, NJ: Erlbaum.

Edwards, R. R., Moric, M., Husfeldt, B., Buvanendran, A., & Ivankovich, O. (2005). Ethnic similarities and differences in the chronic pain experience: A comparison of African American, Hispanic, and white patients. *Pain Medication*, *6*(1), 88-98. doi:10.1111/j.1526-4637.2005.05007.x

Elliott, A. L., Kraus, V. B., Fang, F., Renner, J. B., Schwartz, T. A., Salazar, A., ... & Jordan, J. M. (2007). Joint-specific hand symptoms and self-reported and performance-based functional status in African-Americans and Caucasians: The Johnston County Osteoarthritis Project. *Annals of the Rheumatic Diseases*, *66*(12), 1622-1626.

Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior Research Methods, Instruments, & Computers*, *28*(1), 1-11.

Erickson, W., Lee, C., von Schrader, S. (2012). Disability statistics from the 2010 American Community Survey (ACS): Cornell University Rehabilitation Research and Training Center on Disability Demographics and Statistics (StatsRRTC). Retrieved from http://www.disabilitystatistics.org/reports/acs.cfm?statistic=1

Estrada-Martinez, L. M., Caldwell, C. H., Bauermeister, J. A., & Zimmerman, M. A. (2012). Stressors in multiple life-domains and the risk for externalizing and internalizing behaviors among African Americans during emerging adulthood. *Journal of Youth and Adolescence*, *41*(12), 1600-1612. doi:10.1007/s10964-012-9778-3

Fairchild, A. J., & MacKinnon, D. P. (2009). A general model for testing mediation and moderation effects. *Prevention Science*, *10*(2), 87-99.

Ferraro, K. F., & Shippee, T. P. (2009). Aging and cumulative inequality: How does inequality get under the skin? *The Gerontologist*, *49*(3), 333-343.

Ferraro, K. F., Thorpe, R. J., McCabe, G. P., Kelley-Moore, J. A., & Jiang, Z. (2006). The color of hospitalization over the adult life course: Cumulative disadvantage in black and white? *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *61*(6), 299-306.

Field, A. (2011). *Discovering statistics using IBM SPSS statistics*. Los Angeles, CA: Sage.

Finardi, P., Nickel, C. H., Koller, M. T., & Bingisser, R. (2012). Accuracy of self-reported weight in a high risk geriatric population in the emergency department. *Swiss Medicine Weekly*, *142*, w13585. doi:10.4414/smw.2012.13585

Fiscella, K., Franks, P., Doescher, M. P., & Saver, B. G. (2002). Disparities in health care by race, ethnicity, and language among the insured: Findings from a national sample. *Medical Care*, *40*(1), 52-59.

Fischer, A. R., & Shaw, C. M. (1999). African Americans' mental health and perceptions of racist discrimination: The moderating effects of racial socialization experiences and self-esteem. *Journal of Counseling Psychology*, *46*(3), 395.

Fongwa, M. N., Cunningham, W., Weech-Maldonado, R., Gutierrez, P. R., & Hays, R. D. (2006). Comparison of data quality for reports and ratings of ambulatory care by African American and White Medicare managed care enrollees. *Journal of Aging and Health*, *18*(5), 707-721.

Fries, J. F., Spitz, P., Kraines, R. G., & Holman, H. R. (1980). Measurement of patient outcome in arthritis. *Arthritis & Rheumatism*, *23*(2), 137-145.

Fuller-Thomson, E., Nuru-Jeter, A., Minkler, M., & Guralnik, J.M. (2009). Black–white disparities in disability among older Americans: Further untangling the role of race and socioeconomic status. *Journal of Aging and Health*, *21*(5), 677-698. doi:10.1177/0898264309338296

Furner, S. E., Giloth, B. E., Arguelles, L., Miles, T. P., & Goldberg, J. H. (2004). A co-twin control study of physical function in elderly African American women. *Journal of Aging and Health*, *16*, 28-43. doi:10.1177/0898264303260391

Gaskin, D. J., Dinwiddie, G. Y., Chan, K. S., & McCleary, R. (2012). Residential segregation and disparities in health care services utilization. *Medical Care Research and Review*, *69*(2), 158-175. doi:10.1177/1077558711420263

Gatchel, R. J., Peng, Y. B., Peters, M. L., Fuchs, P. N., & Turk, D. C. (2007). The biopsychosocial approach to chronic pain: Scientific advances and future directions. *Psychological Bulletin*, *133*(4), 581-624.doi: 10.1037/0033-2909.133.4.581

Gee, G. C., Walsemann, K. M., & Brondolo, E. (2012). A life course perspective on how racism may be related to health inequities. *American Journal of Public Health*, *102*(5), 967-974. doi:10.2105/ajph.2012.300666

Geisser, M. E., & Roth, R. S. (1998). Knowledge of and agreement with chronic pain diagnosis: Relation to affective distress, pain beliefs and coping, pain intensity, and disability. *Journal of Occupational Rehabilitation*, *8*(1), 73-88.

Gitlin, L. N., Hauck, W. W., Dennis, M. P., & Schulz, R. (2007). Depressive symptoms in older African-American and white adults with functional difficulties: The role of control strategies. *Journal of the American Geriatrics Society*, *55*(7), 1023-1030. doi:10.1111/j.1532-5415.2007.01224.x

Gordon, H. S., Street, R. L., Jr., Sharf, B. F., Kelly, P. A., & Souchek, J. (2006). Racial differences in trust and lung cancer patients’ perceptions of physician communication. *Journal of Clinical Oncology*, *24*(6), 904-909. doi:10.1200/jco.2005.03.1955

Grafton, K. V., Foster, N. E., & Wright, C. C. (2005). Test–retest reliability of the Short-Form McGill Pain Questionnaire: Assessment of intraclass correlation coefficients and limits of agreement in patients with osteoarthritis. *Clinical Journal of Pain*, *21*(1), 73-82.

Graney, M. J. (2000). The reciprocal relationship between disability and depression. *Journal of the American Geriatrics Society*, *48*(4), 452-453.

Green, C. R., Baker, T. A., & Ndao-Brumblay, S. K. (2004). Patient attitudes regarding healthcare utilization and referral: A descriptive comparison in African- and

Caucasian Americans with chronic pain. *Journal of the National Medical Association*, *96*(1), 31-42.

Green, C. R., Baker, T. A., Smith, E. M., & Sato, Y. (2003). The effect of race in older adults presenting for chronic pain management: A comparative study of black and white Americans. *Journal of Pain*, *4*(2), 82-90.

Greiner, K., Allen, J., Aimee S., Born, W., Hall, S., Engelman, K. K., Okuyemi, … Ahluwalia, J. S. (2005). Predictors of fecal occult blood test (FOBT) completion among low-income adults. *Preventive Medicine*, *41*(2), 676-684.

Grubert, E., Baker, T. A., McGeever, K., & Shaw, B. A. (2013). The role of pain in understanding racial/ethnic differences in the frequency of physical activity among older adults. *Journal of Aging Health*, *25*(3), 405-421. doi:10.1177/0898264312469404

Gulliford, M., Figueroa-Munoz, J., Morgan, M., Hughes, D., Gibson, B., Beech, R., & Hudson, M. (2002). What does “access to health care” mean? *Journal of Health Services and Research Policy*, *7*(3), 186-188.

Guyll, M., Matthews, K. A., & Bromberger, J. T. (2001). Discrimination and unfair treatment: Relationship to cardiovascular reactivity among African American and European American women. *Journal of Health Psychology*, *20*(5), 315-325.

Halanych, J. H., Safford, M. M., Shikany, J. M., Cuffee, Y., Person, S. D., Scarinci, I. C., . . . Allison, J. J. (2011). The association between income, education, and experiences of discrimination in older African American and European American patients. *Ethnicity and Disease*, *21*(2), 223-229.

Halbert, C.H., Armstrong, K., Gandy, O.H., Jr., & Shaker, L. (2006). Racial differences in trust in health care providers. *Archives of Internal Medicine*, *166*(8), 896.

Hall, K. M., Dijkers, M., Whiteneck, G., Brooks, C. A., & Stuart Krause, J. (1998). The Craig handicap assessment and reporting technique (CHART): Metric properties and scoring. *Topics in Spinal Cord Injury Reha*bilitation, *4*(1), 16-30.

Hall-Flavin, D. K. (2013). Depression (major depressive order). Retrieved from Mayo Clinic website: http://www.mayoclinic.com/health/clinical-depression/AN01057

Harrell, C. J. P., Burford, T. I., Cage, B. N., Nelson, T. M., Shearon, S., Thompson, A., & Green, S. (2011). Multiple pathways linking racism to health outcomes. *Du Bois Review: Social Science Research on Race, 8*(1), 143-157. doi:10.1017/s1742058x11000178

Harris, M. I. (2001). Racial and ethnic differences in health care access and health outcomes for adults with type 2 diabetes. *Diabetes Care*, *24*(3), 454-459.

Harrison, T. (2009a). Health disparities among Latinas aging with disabilities. *Family & Community Health*, *32*(1), 1-12.

Harrison, T. (2009b). Development of the Activity Effort Scale for women aging with paralytic polio. *Journal of Neuroscience Nursing*, *41*(3), 168-176.

Harrison, T. C., & Kahn, D. L. (2004). Disability rites: the cultural shift following impairment. *Family & Community Health, 27*(1), 86-93.

Harrison, T., & Stuifbergen, A. (2001). Barriers that further disablement: A study of survivors of polio. *Journal of Neuroscience Nursing, 33*(3), 160-166.

Harrison T., Taylor J., Fredland, N., Stuifbergen A., Walker J., & Choban R. (2013). A qualitative analysis of life course adjustment to multiple morbidity and disability. *Research in Gerontological Nursing, 6*(1), 57-69. doi:10.3928/19404921-20121107-01

Harrison, T. C., Walker, J., Hendrickson, S. & Blozis, S. (2012, December) *An ethnographic study of health disparities in disablement in Mexican American women.* Poster presented at The National Institutes of Health 2012 Summit on the Science of Eliminating Health, National Harbor, MD.

Hatch, S. L. (2005). Conceptualizing and identifying cumulative adversity and protective resources: Implications for understanding health inequalities. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 60*(2), 130-134.

Hattery, A. J., & Smith, E. (2007). *African American families*. Thousand Oaks, CA: Sage.

Hayat, M. J. (2013). Understanding sample size determination in nursing research. *Western Journal of Nursing Res*earch, *35*(7), 943-956. doi:10.1177/0193945913482052

HealthyPeople.gov. (2011). *Older Adults*. Retrieved from http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=31

Henry J. Kaiser Family Foundation. (2004, February 29). *Racial and Ethnic Disparities in Women's Health Coverage and Access to Care: Findings from the 2001 Kaiser Women's Health Survey*. Retrieved from http://kff.org/disparities-policy/issue-brief/racial-and-ethnic-disparities-in-womens-health/

Herrero-Beaumont, G., Roman-Blas, J. A., Castañeda, S., & Jimenez, S. A. (2009). Primary osteoarthritis no longer primary: Three subsets with distinct etiological, clinical, and therapeutic characteristics. *Seminars in Arthritis and Rheumatism*, *39*, 71-80. doi:10.1016/j.semarthrit.2009.03.006

Hicken, M. T., Lee, H., Ailshire, J., Burgard, S. A., & Williams, D. R. (2013). “Every shut eye, ain’t sleep”: The role of racism-related vigilance in racial/ethnic disparities in sleep difficulty. *Race and Social Problems*, *5*(2), 100-112. doi:10.1007/s12552-013-9095-9

Hochberg, M. C., Kasper, J., Williamson, J., Skinner, A., & Fried, L. P. (1995). The contribution of osteoarthritis to disability: Preliminary data from the Women's Health and Aging Study. *Journal of Rheumatology*, *43*, 16-18.

Houston, D. K., Stevens, J., & Cai, J. (2005). Abdominal fat distribution and functional limitations and disability in a biracial cohort: The Atherosclerosis Risk in Communities Study. *International Journal of Obesity*, *29*(12), 1457-1463. doi:10.1038/sj.ijo.0803043

Houston, D. K., Stevens, J., Cai, J., & Morey, M. C. (2005). Role of weight history on functional limitations and disability in late adulthood: The ARIC study. *Journal of Obesity Research*, *13*(10), 1793-1802. doi:10.1038/oby.2005.218

Horgas, A. L., Yoon, S. L., Nichols, A. L., & Marsiske, M. (2008). The relationship between pain and functional disability in Black and White older adults. *Journal of Nursing Research and Health, 31*(4), 341-354. doi:10.1002/nur.20270

How to score MDHAQ. (2009). Retrieved from Multi-Dimensional Health Assessment Questionnaire web site. http://www.mdhaq.org/Public/HowToScore.aspx

Hupcey, J. E., & Miller, J. (2006). Community dwelling adults' perception of interpersonal trust vs. trust in health care providers. *Journal of Clinical Nursing, 15*(9), 1132-1139.

Husaini, B. A., & Moore, S. T. (1990). Arthritis disability, depression, and life satisfaction among black elderly people. *Health & Social Work*, *15*(4), 253-260.

IBM Corporation. (2013). Statistical Package for the Social Sciences (SPSS). Version 22.

Ibrahim, S. A., Siminoff, L. A., Burant, C. J., & Kwoh, C. K. (2002). Understanding ethnic differences in the utilization of joint replacement for osteoarthritis: The role of patient-level factors. *Medical Care, 40*(1), I-44-I-51.

Jackson, J. S., & Sellers, S. L. (2001). Health and the elderly. In R. L. Braithwaite & S. E. Taylor (Eds.), *Health issues in the Black community* (2nd ed., pp. 81-96). San Francisco: Jossey-Bass.

James, S. A., Fowler-Brown, A., Raghunathan, T. E., & Van Hoewyk, J. (2006). Life-course socioeconomic position and obesity in African American women: The Pitt County study. *American Journal of Public Health*, *96*(3), 554-560. doi:10.2105/ajph.2004.053447

Jang, Y., Chiriboga, D. A., Kim, G., & Phillips, K. (2008). Depressive symptoms in four racial and ethnic groups: The Survey of Older Floridians (SOF*). Research on Aging*, *30*(4), 488-502.

Jensen, M. P., Karoly, P., & Huger, R. (1987). The development and preliminary validation of an instrument to assess patients' attitudes toward pain. *Journal of Psychosomatic Research, 31*(3), 393-400.

Jensen, M. P., Turner, J. A., & Romano, J. M. (2000). Pain belief assessment: A comparison of the short and long versions of the Survey of Pain Attitudes. *Journal of Pain*, *1*(2), 138-150.

Jones, D. (2009). Disabilities in older African-American women: Understanding the current state of the literature. *Journal of the National Black Nurses' Association*, *20*(2), 55-64.

Jordan, J. M., Helmick, C. G., Renner, J. B., Luta, G., Dragomir, A. D., Woodard, J., . . . Hochberg, M. C. (2007). Prevalence of knee symptoms and radiographic and symptomatic knee osteoarthritis in African Americans and Caucasians: The Johnston County Osteoarthritis Project. *Journal of Rheumatology*, *34*(1), 172-180.

Jordan, J. M., Linder, G. F. Renner, J. B., & Fryer, J. G. (1995). The impact of arthritis in rural populations. *Arthritis Care & Research*, *8*(4), 242-250.

Jordan, J. M., Luta, G., Renner, J. B., Dragomir, A., Hochberg, M. C., & Fryer, J. G. (1996). Ethnic differences in self-reported functional status in the rural south: The Johnston County Osteoarthritis Project. *Arthritis Care and Research, 9*(6), 483-491. doi:10.1002/art.1790090610

Jordan, J. M., Luta, G., Renner, J. B., Dragomir, A., Hochberg, M. C., & Fryer, J. G. (1997). Knee pain and knee osteoarthritis severity in self-reported task-specific disability: The Johnston County Osteoarthritis Project. *Journal of Rheumatology*, *24*(7), 1344-1349.

Jordan, M. S., Lumley, M. A., & Leisen, J. C. (1998). The relationships of cognitive coping and pain control beliefs to pain and adjustment among African-American and Caucasian women with rheumatoid arthritis. *Arthritis Care & Research*, *11*(2), 80-88.

Judd, C. M., & Kenny, D. A (1981). Process analysis estimating mediation in treatment evaluations. *Evaluation Review*, *5*(5), 602-619.

Kail, B. L., & Taylor, M. G. (in press). Cumulative inequality and racial disparities in health: Private insurance coverage and black/white differences in functional limitations. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. doi:10.1093/geronb/gbu005

Kaplan, G. A. (1992). Maintenance of functioning in the elderly. *Annals of Epidemiology, 2*(6), 823-834.

Keefe, F. J., Lefebvre, J. C., Egert, J. R., Affleck, G., Sullivan, M. J., & Caldwell, D. S. (2000). The relationship of gender to pain, pain behavior, and disability in osteoarthritis patients: The role of catastrophizing. *Pain, 87,* 325-334. doi:10.1016/S0304-3959(00)00296-7

Klein, S., Allison, D. B., Heymsfield, S. B., Kelley, D. E., Leibel, R. L., Nonas, C., & Kahn, R. (2007). Waist circumference and cardio metabolic risk: A consensus statement from shaping America's health. Association for Weight Management and Obesity Prevention; NAASO, the Obesity Society; the American Society for Nutrition; and the American Diabetes Association. *Obesity, 15*(5), 1061-1067.

Klonoff, E. A., & Landrine, H. (1999). Cross-validation of the schedule of racist events. *Journal of Black Psychology, 25*(2), 231-254. doi:10.1177/0095798499025002006

Kremer, E., & Atkinson, J. H., Jr. (1981). Pain measurement: Construct validity of the affective dimension of the McGill Pain Questionnaire with chronic benign pain patients. *Pain, 11*(1), 93-100.

Koster, A., Patel, K. V., Visser, M., van Eijk, J. T., Kanaya, A. M., de Rekeneire, N., . . . Harris, T. B. (2008). Joint effects of adiposity and physical activity on incident mobility limitation in older adults. *Journal of the American Geriatrics Society, 56*(4), 636-643. doi:10.1111/j.1532-5415.2007.01632.x

Kotlarz, H., Gunnarsson, C. L., Fang, H., & Rizzo, J. A. (2009). Insurer and out- of-pocket costs of osteoarthritis in the US: Evidence from national survey data. *Arthritis & Rheumatism, 60*(12), 3546-3553.

Kuzma, J. W., & Bohnenblust, S. E. (2005). *Basic statistics for the health sciences*. New York, NY: McGraw-Hill.

Kwate, N. A., Valdimarsdottir, H. B., Guevarra, J. S., & Bovbjerg, D. H. (2003). Experiences of racist events are associated with negative health consequences for African American women. *Journal of the National Medical Association*, *95*(6), 450.

Landrine, H., & Klonoff, E. A. (1996). The Schedule of Racist Events: A measure of racial discrimination and a study of its negative physical and mental health consequences. *Journal of Black Psychology*, *22*(2), 144-168. doi:10.1177/00957984960222002

Landrine, H., Klonoff, E. A., Corral, I., Fernandez, S., & Roesch, S. (2006). Conceptualizing and measuring ethnic discrimination in health research. *Journal of Behavioral Medicine*, *29*(1), 79-94.

Lazarus, R., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.

Lee, C., Ayers, S. L., & Kronenfeld, J. J. (2009). The association between perceived provider discrimination health care utilization, and health status in racial and ethnic minorities. *Ethnicity & Disease*, *19*(3), 330-337.

Leveille, S. G., Fried, L. P., McMullen, W., & Guralnik, J. M. (2004). Advancing the taxonomy of disability in older adults. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences, 59*, M86-M93. doi:10.1093/gerona/59.1.M86

Lin, E. H. B., Katon, W., Von Korff, M., Tang, L., Williams, J. W., Jr., Kroenke, K., … Arean, P. (2003). Effect of improving depression care on pain and functional outcomes among older adults with arthritis. *Journal of the American Medical Association*, *290*(18), 2428-2429.

Ling, S. M., Fried, L. P., Garrett, E., Hirsch, R., Guralnik, J. M., & Hochberg, M. C. (2000). The accuracy of self-report of physician diagnosed rheumatoid arthritis in moderately to severely disabled older women: Women's Health and Aging Collaborative Research Group. *Journal of Rheumatology*, *27*(6), 1390-1394.

Linton, S. J., & Shaw, W. S. (2011). Impact of psychological factors in the experience of pain. *Physical Therapy, 91*(5), 700-711.

Loeser, R. F., & Shakoor, N. (2003). Aging or osteoarthritis: Which is the problem? *Rheumatic Disease Clinics of North America*, *29*(4), 653-673.

Lorig, K. R., Ritter, P. L., Laurent, D. D., & Plant, K. (2008). The internet- based arthritis self- management program: A one- year randomized trial for patients with arthritis or fibromyalgia. *Arthritis Care Research*, *59*(7), 1009-1017.

Lorig, K., Drph, K. L. R., Stewart, A., Ritter, P., Gonzalez, V. M., Laurent, D., & Lynch, J. (1996). *Outcome measures for health education and other health care interventions*. Thousand Oaks, CA: Sage Publications.

Lorig, K. R., Ritter, P., Stewart, A. L., Sobel, D. S., Brown, B. W., Jr., Bandura, A., . . . Holman, H. R. (2001). Chronic disease self-management program: 2-year health status and health care utilization outcomes. *Journal of Medical Care,* 39 (11), 1217-1223.

Losina, E., Walensky, R. P., Reichmann, W. M., Holt, H. L., Gerlovin, H., Solomon, D. H., . . . Katz, J. N. (2011). Impact of obesity and knee osteoarthritis on morbidity and mortality in older Americans. *Annals of Internal Medicine*, *154*(4), 217-226. doi:10.1059/0003-4819-154-4-201102150-00001

Lozada, C. J. & Diamond, H. S. (2013). *Osteoarthritis*. Retrieved from Medscape website: http://emedicine.medscape.com/article/330487-overview

Lysack, C. L., MacNeill, S. E., & Lichtenberg, P. A. (2001). The functional performance of elderly urban African-American women who return home to live alone after medical rehabilitation. *American Journal of Occupational Therapy*, *55*(4), 433-440.

Main, C. J., Foster, N., & Buchbinder, R. (2010). How important are back pain beliefs and expectations for satisfactory recovery from back pain? *Best Practice & Research Clinical Rheumatology*, *24*(2), 205-217.

Maleki-Fischbach, M., & Jordan, J. M. (2010). New developments in osteoarthritis: Sex differences in magnetic resonance imaging-based biomarkers and in those of joint metabolism. *Arthritis Research Therapy*, *12*(4, Art. No. 212), 1-8. doi:10.1186/ar3091

Mangione, K. K., Craik, R. L., McCormick, A. A., Blevins, H. L., White, M. B., Sullivan-Marx, E. M., & Tomlinson, J. D. (2010). Detectable changes in physical performance measures in elderly African Americans. *Physical Therapy, 90*(6), 921-927. doi:10.2522/ptj.20090363

Martel-Pelletier, J., & Pelletier, Jean-Pierre. (2010). Is osteoarthritis a disease involving only cartilage or other articular tissues? *Joint Diseases and Related Surgery*, *21*(1), 2-14.

Mayo Clinic. (2013). Osteoarthritis. Retrieved from http://www.mayoclinic.com/health/osteoarthritis/DS00019

McCracken, L. M., Matthews, A. K., Tang, T. S., & Cuba, S. L. (2001). A comparison of blacks and whites seeking treatment for chronic pain. *Clinical Journal of Pain*, *17*(3), 249-255.

McIlvane, J. M., Baker, T. A., & Mingo, C. A. (2008). Racial differences in arthritis-related stress, chronic life stress, and depressive symptoms among women with arthritis: A contextual perspective. *Journals of Gerontology Series B: Psychology and Social Sciences*, *63*(5), 320-327.

Meade, M. A., Lewis, A., Jackson, M. N., & Hess, D. W. (2004). Race, employment, and spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, *85*(11), 1782-1792.

Mellick, D., Walker, N., Brooks, C. A., & Whiteneck, G. (1999). Incorporating the cognitive independence domain into CHART. *Journal of Rehabilitation Outcomes Measurement*, *3*, 12-21.

Melzack, R. (1975). The McGill Pain Questionnaire: Major properties and scoring methods. *Pain*, *1*(3), 277-299.

Melzack, R. (1987). The short-form McGill Pain Questionnaire. *Pain*, *30*(2), 191-197.

Melzack, R., & Torgerson, W. S. (1971). On the language of pain. *Anesthesiology*, *34*(1), 50.

Mendes de Leon, C. F., & Rajan, K. B. (2014). Psychosocial influences in onset and progression of late life disability. *Journals of Gerontology Series B:*

Psychological Sciences and Social Sciences, *69*(2), 287-302. doi:10.1093/geronb/gbt130

Merton, R. K. (1988). The Matthew effect in science, II: Cumulative advantage and the symbolism of intellectual property. *Isis*, *79*(4), 606-623.

Miles, J., & Shevlin, M. (2001). *Applying regression and correlation: A guide for students and researchers*. London: Sage.

Moradi, B., & Subich, L.M. (2003). A concomitant examination of the relations of perceived racist and sexist events to psychological distress for African American women. *The Counseling Psychologist*, *31*(4), 451-469. doi:10.1177/0011000003031004007

Morales, L. S., Elliott, M. N., Weech-Maldonado, R., Spritzer, K. L., & Hays, R. D. (2001). Differences in CAHPS adult survey reports and ratings by race and ethnicity: an analysis of the National CAHPS benchmarking data 1.0. *Health Services Research*, 36(3), 595-617.

Moore-Greene, G. M., Gross, S. M., Silver, K. D., & Perrino, C. S. (2012). Chronic stress and decreased physical exercise: Impact on weight for African American women. *Ethnicity & Disease*, *22*(2), 185-191.

Mossey, J. M. (2011). Defining racial and ethnic disparities in pain management. *Clinical Orthopaedics and Related Research*, *469*(7), 1859-1870. doi:10.1007/s11999-011-1770-9

Mouton, C. P., Carter-Nolan, P. L., Makambi, K. H., Taylor, T. R., Palmer, J. R., Rosenberg, L., & Adams-Campbell, L. L. (2010). Impact of perceived racial discrimination on health screening in black women. *Journal of Health Care for the Poor and Underserved*, *21*(1), 287-300. doi:10.1353/hpu.0.0273

Murrock, C. J., & Zauszniewski, J. A. (2011). Late life function and disability instrument in African American women: Function component. *Women and Health*, *51*(5), 482-496. doi:10.1080/03630242.2011.589493

Murtagh, K. N., & Hubert, H. B. (2004). Gender differences in physical disability among an elderly cohort. *American Journal of Public Health*, *94*(8), 1406-1411.

Musa, D., Schulz, R., Harris, R., Silverman, M., & Thomas, S. B. (2009). Trust in the health care system and the use of preventive health services by older black and white adults. *American Journal of Public Health*, *99*(7), 1293-1299. doi:10.2105/ajph.2007.123927

Nagi, S. Z. (1991). Disability concepts revisited: Implications for prevention. In A. M. Pope & A. R. Tarlov (Eds.), *Disability in America: Toward a national agenda for prevention* (pp. 309-327). Washington, DC: National Academy Press.

National Institute on Aging (2008). Health & Aging AgePage: Menopause. Retrieved from http://www.nia.nih.gov/health/publication/menopause

National Institute of Health. (2013). Physical medicine and rehabilitation. Retrieved from MedlinePlus web site: http://www.nlm.nih.gov/medlineplus/ency/article/007448.htm

National Institute of Mental Health. (2013). What is depression? Retrieved from NIMH Depression web site: http://www.nimh.nih.gov/health/topics/depression/index.shtml

Ndao-Brumblay, S. K., & Green, C. R. (2005). Racial differences in the physical and psychosocial health among black and white women with chronic pain. *Journal of the National Medical Association*, *97*(10), 1369-1377.

Nelson, A. E., Renner, J. B., Schwartz, T. A., Kraus, V. B., Helmick, C. G., & Jordan, J. M. (2011). Differences in multijoint radiographic osteoarthritis phenotypes among African Americans and Caucasians: The Johnston County Osteoarthritis Project. *Arthritis & Rheumatology*, *63*(12), 3843-3852. doi:10.1002/art.30610

Neogi, T., & Zhang, Y. (2013). Epidemiology of osteoarthritis. *Rheumatic Disease Clinics of North America*, *39*(1), 1-19. doi:10.1016/j.rdc.2012.10.004

Newton, R. A., Cromwell, R. L., & Rogers, H. L. (2009). The relationship between physical performance and obesity in elderly African-American women. *Physical & Occupational Therapy in Geriatrics*, *27*(6), 423-440.

Nicholson, R. A., Rooney, M., Vo, K., O'Laughlin, E., & Gordon, M. (2006). Migraine care among different ethnicities: Do disparities exist? *Headache*, *46*(5), 754-765. doi:10.1111/j.1526-4610.2006.00453.x

O'brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity*, *41*(5), 673-690. doi:10.1007/s11135-006-9018-6

Okosun, I. S., Bhatt, D. V., Boltri, J. M., & Ndirangu, M. (2008). Self-reported and measured height and weight: Impact on racial/ethnic differences in hypertension. *Ethnicity and Disease*, *18*(4), 415-420.

Oksanen, T., Kivimäki, M., Pentti, J., Virtanen, M., Klaukka, T., & Vahtera, J. (2010). Self-report as an indicator of incident disease. *Annals of Epidemiology*, *20*(7), 547-554.

O'Malley, A. S., Sheppard, V. B., Schwartz, M., & Mandelblatt, J. (2004). The role of trust in use of preventive services among low-income African-American women. *Preventive Medicine, 38*(6), 777-785. doi:10.1016/j.ypmed.2004.01.018

Oslin, D. W., Streim, J., Katz, I. R., Edell, W. S., & TenHave, T. (2000). Change in disability follows inpatient treatment for late life depression. *Journal of the American Geriatrics Society*, *48*(4), 357-362.

Ostir, G. V., Markides, K. S., Black, S. A., & Goodwin, J. S. (1998). Lower body functioning as a predictor of subsequent disability among older Mexican Americans. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *53*(6), M491-M495.

Owsley, C., McGwin, G., Scilley, K., Girkin, C. A., Phillips, J. M., & Searcey, K. (2006). Perceived barriers to care and attitudes about vision and eye care: Focus groups with older African Americans and eye care providers. *Investigative Ophthalmology & Visual Science, 47*(7), 2797-2802. doi:10.1167/iovs.06-0107

Parmelee, P. A., Harralson, T. L., McPherron, J. A., DeCoster, J., & Schumacher, H. R. (2012). Pain, disability, and depression in osteoarthritis: Effects of race and sex. *Journal of Aging and Health*, *24*(1), 168-187. doi:10.1177/0898264311410425

Pascoe, E. A, & Smart Richman, L. (2009). Perceived discrimination and health: A meta-analytic review. *Psychological Bulletin, 135*(4), 531.

Payette, H., Gueye, R., Gaudreau, P., Morais, J.A., Shatenstein, B., & Gray-Donald, K. (2011). Trajectories of physical function decline and psychological functioning: The Quebec longitudinal study on nutrition and successful aging (NuAge). *Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 66*(1), 82-90.

Peek, M. K., Ottenbacher, K. J., Markides, K. S., & Ostir, G. V. (2003). Examining the disablement process among older Mexican American adults. *Social Science & Medicine, 57*(3), 413-425.

Peek, M. K., Patel, K. V., & Ottenbacher, K. J. (2005). Expanding the disablement process model among older Mexican Americans. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *60*(3), 334-339.

Peek, M. E., Wagner, J., Tang, H., Baker, D. C., & Chin, M. H. (2011). Self-reported racial discrimination in health care and diabetes outcomes. *Medical Care*, *49*(7), 618-625. doi:10.1097/MLR.0b013e318215d925

Peters, R. M. (2006). The relationship of racism, chronic stress emotions, and blood pressure. *Journal of Nursing Scholarship*, *38*(3), 234-240.

Polit, D. F., & Beck, C.T. (2011). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia: Lippincott Williams & Wilkins.

Pollitt, R. A., Kaufman, J. S., Rose, K. M., Diez-Roux, A. V., Zeng, D., & Heiss, G. (2007). Early-life and adult socioeconomic status and inflammatory risk markers in adulthood. *European Journal of Epidemiology*, *22*(1), 55-66.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods & Instrumentation*, *36*(4), 717-731.

Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*(3), 385-401. doi:10.1177/014662167700100306

RAND Corporation. (2010). *Health Care Access*. Retrieved from http://www.rand.org/topics/health-care-access.html.

Rhee, M. K., Cook, C. B., Dunbar, V. G., Panayioto, R. M., Berkowitz, K. J., Boyd, B., ... Phillips, L. S. (2005). Limited health care access impairs glycemic control in low income urban African Americans with type 2 diabetes. *Journal of Health Care for the Poor and Underserved*, *16*(4), 734-746. doi:10.1353/hpu.2005.0100

Ritter, P. L., Stewart, A. L., Kaymaz, H., Sobel, D. S., Block, D. A., & Lorig, K. R. (2001). Self-reports of health care utilization compared to provider records. *Journal of Clinical Epidemiology*, *54*(2), 136-141.

Rubin, L. H., Witkiewitz, K., Andre, J. St., & Reilly, S. (2007). Methods for handling missing data in the behavioral neurosciences: Don't throw the baby rat out with the bath water. *Journal of Undergraduate Neuroscience Education*, *5*(2), 71-77.

Ruehlman, L.S., Karoly, P., & Newton, C. (2005). Comparing the experiential and psychosocial dimensions of chronic pain in African Americans and Caucasians: Findings from a national community sample. *Pain Medicine*, *6*(1), 49-60.

Ricks, T. N., & Harrison, T. (2013). Disability and health: Exploring the disablement experience of young adult African Americans. *Disability & Rehabilitation*, *36*(6), 479-486.

Saha, S., Jacobs, E. A., Moore, R. D., & Beach, M.C. (2010). Trust in physicians and racial disparities in HIV care. *AIDS Patient Care and STDs*, *24*(7), 415-420.

Seeman, T., & Chen, X. (2002). Risk and protective factors for physical functioning in older adults with and without chronic conditions: MacArthur Studies of Successful Aging. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *57*(3), 135-144.

Sharma, A. (2012). Health disparities in later life: A simultaneous equations analysis of utilization. *Journal of Health and Aging*, *24*(8), 1421-1448. doi:10.1177/0898264312460276

Sheppard, V. B., Mays, D., LaVeist, T., & Tercyak, K. P. (2013). Medical mistrust influences black women's level of engagement in BRCA 1/2 genetic counseling and testing. *Journal of the National Medical Association*, *105*(1), 17-22.

Silverman, M., Nutini, J., Musa, D., Schoenberg, N. E., & Albert, S. M. (2009). “Is it half full or half empty?” Affective responses to chronic illness. *Journal of Cross-Cultural Gerontology*, *24*(3), 291-306. doi:10.1007/s10823-009-9097-7

Sims, E. L., Keefe, Francis J., Kraus, V.B., Guilak, F., Queen, R. M., & Schmitt, D. (2009). Racial differences in gait mechanics associated with knee osteoarthritis. *Aging Clinical and Experimental Research*, *21*(6), 463-469.

Simpson, C. F., Boyd, C. M., Carlson, M. C., Griswold, M. E., Guralnik, J. M., & Fried, L. P. (2004). Agreement between self- report of disease diagnoses and medical record validation in disabled older women: Factors that modify agreement. *Journal of the American Geriatrics Society*, *52*(1), 123-127.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*, *13*(1982), 290-312.

Song, J., Chang, H. J., Tirodkar, M., Chang, R. W., Manheim, L. M., & Dunlop, D. D. (2007). Racial/ethnic differences in activities of daily living disability in older adults with arthritis: A longitudinal study. *Arthritis Care & Research*, *57*(6), 1058-1066.

Sowers, M., Jannausch, M. L., Gross, M., Karvonen-Gutierrez, C. A., Palmieri, R. M., Crutchfield, M., & Richards-McCullough, K. (2006). Performance-based physical functioning in African-American and Caucasian women at midlife: Considering body composition, quadriceps strength, and knee osteoarthritis. *American Journal of Epidemiology*, *163*(10), 950-958. doi:10.1093/aje/kwj109

Star, V. L., Scott, J. C., Sherwin, R., Lane, N., Nevitt, M. C., & Hochberg, M. C. (1996). Validity of self-reported rheumatoid arthritis in elderly women. *Journal of Rheumatology*, 23(11), 1862-1865.

Stephenson, N., Dalton, J. A., Carlson, J., Youngblood, R., & Bailey, D. (2009). Racial and ethnic disparities in cancer pain management. *Journal of the Black Nurses' Association*, *20*(1), 11-18.

Stommel, M., & Schoenborn, C. A. (2009). Accuracy and usefulness of BMI measures based on self-reported weight and height: Findings from the NHANES & NHIS 2001-2006. *BMC Public Health*, *9*, 421. doi:10.1186/1471-2458-9-421.

Strong, J., Ashton, R., & Chant, D. (1992). The measurement of attitudes towards and beliefs about pain. *Pain*, *48*(2), 227-236.

Stuifbergen, A. K., Blozis, S. A., Harrison, T. C., & Becker, H. A. (2006). Exercise, functional limitations, and quality of life: A longitudinal study of persons with multiple sclerosis. *Archives of Physical Medicine and Rehabilitation, 87*(7), 935-943.

Stuifbergen, A., Brown, A., & Phillips, L. (2009). Predictors and moderators of the disablement process in persons with multiple sclerosis. *NeuroRehabilitation*, *24*(2), 119-129.

Stuifbergen, A. K., Seraphine, A., Harrison, T., & Adachi, E. (2005). An explanatory model of health promotion and quality of life for persons with post-polio syndrome. *Social Science & Medicine*, *60*, 383-393.

Subramanyam, M. A., Diez-Roux, A. V., Hickson, D. A., Sarpong, D. F., Sims, M., Taylor, H. A., Jr., … Wyatt, S. B. (2012). Subjective social status and psychosocial and metabolic risk factors for cardiovascular disease among African Americans in the Jackson Heart Study. *Social Science & Medicine*, *74*(8), 1146-1154. doi:10.1016/j.socscimed.2011.12.042

Szanton, S. L., Thorpe, R. J., & Whitfield, K. (2010). Life-course financial strain and health in African-Americans. *Social Science & Medicine, 71*(2), 259-265. doi:10.1016/j.socscimed.2010.04.001

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston: Pearson.

Tait, R. C., & Chibnall, J. T. (1997). Physician judgments of chronic pain patients. *Social Science & Medicine*, *45*(8), 1199-1205.

Tan, G., Jensen, M. P., Thornby, J., & Anderson, K. O. (2005). Ethnicity, control appraisal, coping, and adjustment to chronic pain among black and white Americans. *Pain Medicine*, *6*(1), 18-28. doi:10.1111/j.1526-4637.2005.05008.x

Taylor, J., Henderson, D., & Jackson, B. B. (1991). A holistic model for understanding and predicting depressive symptoms in African- American women. *Journal of Community Psychology*, *19*(4), 306-320.

Thorpe, R. J., Jr., Clay, O. J., Szanton, S. L., Allaire, J. C., & Whitfield, K. E. (2011). Correlates of mobility limitation in African Americans. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *66*(11), 1258-1263. doi:10.1093/gerona/glr122

Thorpe, R. J., Jr., Kasper, J. D., Szanton, S. L., Frick, K. D., Fried, L. P., & Simonsick, E. M. (2008). Relationship of race and poverty to lower extremity function and decline: Findings from the women's health and aging study. *Social Science & Medicine*, *66*, 811-821.

Thorpe, R. J., Jr., Szanton, S. L., Bell, C. N., & Whitfield, K. E. (2013). Education, income and disability in African Americans. *Ethnicity & Disease, 23*(1), 12-17.

Thorpe, R. J., Jr., Weiss, C. Xue, Q.-L., & Fried, L. (2009). Transitions among disability levels or death in African American and White older women. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *64*(6), 670-674. doi:10.1093/gerona/glp010

Troxel, W. M., Matthews, K. A., Bromberger, J. T., & Sutton-Tyrrell, K. (2003). Chronic stress burden, discrimination, and subclinical carotid artery disease in African American and Caucasian women. *Health Psychology*, *22*(3), 300-309.

Truesdale, K. P., & Stevens, J. (2008). Do the obese know they are obese? *North Carolina Medical Journal*, *69*(3), 188-194.

Turner, R. J., & Lloyd, D. A. (1995). Lifetime traumas and mental health: The significance of cumulative adversity. *Journal of Health and Social Behavior, 36*(4), 360-376.

Uebelacker, L. A., Eaton, C. B., Weisberg, R., Sands, M., Williams, C., Calhoun, D., . . . Taylor, T. (2013). Social support and physical activity as moderators of life stress in predicting baseline depression and change in depression over time in the Women's Health Initiative. *Social Psychiatry and Psychiatric Epidemiology, 48*(12), 1971-1982. doi:10.1007/s00127-013-0693-z

Unson, C. G., Ohannessian, C., Kenyon, L., Fenster, J., Reisine, S., & Prestwood, K. (2004). Strategies for enrolling diverse older women in an osteoporosis trial. *Journal of Aging and Health, 16,* 669-687.

U.S. Census Bureau (2008). *Americans with disabilities: 2005*. Retrieved from http://www.census.gov/prod/2008pubs/p70-117.pdf

U.S. Census Bureau. (2010a). *Americans with disabilities: 2010*. Retrieved from http://www.census.gov/population/www/socdemo/race/ppl-ba08.html

U.S. Census Bureau. (2010b). State & County QuickFacts: Texas. Retrieved from http://quickfacts.census.gov/qfd/states/48000.html

U.S. Census Bureau. (2013). State & County QuickFacts: New Mexico. Retrieved from http://quickfacts.census.gov/qfd/states/35000.html

U.S. Department of Health and Human Services: National Heart, Lung, & Blood Institute. (2000). *The practical guide: Identification, evaluation, and treatment of overweight and obesity in adults*. Retrieved from http://www.nhlbi.nih.gov/guidelines/obesity/prctgd_c.pdf

U. S. Department of Health and Human Services (2010). *Minority women's health: Overweight and obesity.* Retrieved from Women's Health.gov web site: http://womenshealth.gov/minority-health/african-americans/obesity.html

U.S. Department of Health and Human Services: Agency for Healthcare Research and Quality. (2012). *CAHPS clinician and group surveys*. Retrieved from http://www.cahps.ahrq.gov/clinician_group/cgsurvey/adultsupplementalitemseng2.pdf

Vallerand, A. H., Pieper, B., Crawley, J., Nordstrom, C., & DiNardo, E. (2013). The prevalence of pain and its association with psychosocial factors for indigent adults enrolled in a primary care clinic. *Clinical Journal of Pain*, *29*(10), 917-9234. doi:10.1097/AJP.0b013e31827c7b30

Van der Kraan, P. M. (2012). Osteoarthritis year 2012 in review: Biology. *Osteoarthritis and Cartilage*, *20*(12), 1447-1450.

Verbrugge, L. M., & Jette, A. M. (1994). The disablement process. *Social Science & Medicine, 38*(1), 1-14.

Vermeulen, J., Neyens, J. C. L., van Rossum, E., Spreeuwenberg, M. D., & de Witte, L. P. (2011). Predicting ADL disability in community-dwelling elderly people using physical frailty indicators: a systematic review. *BMC Geriatrics*, *11* (Art. No. 33), 1-11. doi:10.1186/1471-2318-11-33

Walker, N., Mellick, D., Brooks, C. A., & Whiteneck, G. G. (2003). Measuring participation across impairment groups using the Craig Handicap Assessment Reporting Technique. *American Journal of Physical Medicine and Rehabilitation*, *82*(12), 936-941. doi:10.1097/01.phm.0000098041.42394.9a

Warner, D. F., & Brown, T. H. (2011). Understanding how race/ethnicity and gender define age-trajectories of disability: An intersectionality approach. *Social Science & Medicine*, *72*(8), 1236-1248. doi:10.1016/j.socscimed.2011.02.034

Warner, R. (2013). *Applied statistics: From bivariate to multivariate techniques* (2nd ed.). Thousand Oaks, CA: Sage.

Watkins, Y. J., Bonner, G. J., Wang, E., Wilkie, D. J., Ferrans, C. E., & Dancy, D. (2012). Relationship among trust in physicians, demographics, and end-of-life treatment decisions made by African American dementia caregivers. *Journal of Hospice & Palliative Nursing*, *14*(3), 238.

Wee, C. C., Huskey, K. W., Ngo, L. H., Fowler-Brown, A., Leveille, S. G., Mittlemen, M. A., & McCarthy, E. P. (2011). Obesity, race, and risk for death or functional decline among Medicare beneficiaries: A cohort study. *Annals of Internal Medicine*, *154*(10), 645-655. doi:10.1059/0003-4819-154-10-201105170-00003

Weiner, D. K., Haggerty, C. L., Kritchevsky, S. B., Harris, T., Simonsick, E. M., Nevitt, M., & Newman, A. (2003). How does low back pain impact physical function in independent, well-functioning older adults? Evidence from the Health ABC Cohort and implications for the future. *Pain Medicine*, *4*(4), 311-320.

Weinick, R. M., Zuvekas, S. H., & Cohen, J. W. (2000). Racial and ethnic differences in access to and use of health care services, 1977 to 1996. *Medical Care Research and Review*, *57*(1), 36-54.

Whiteneck, G., Brooks, C. A., Mellick, D., Harrison-Felix, C., Terrill, M. S., & Noble, K. (2004). Population-based estimates of outcomes after hospitalization for traumatic brain injury in Colorado. *Archives of Physical Medicine and Rehabilitation*, *85,* 73-81.

Whiteneck, G. G., Charlifue, S. W., Gerhart, K. A., Overholser, J. D., & Richardson, G. N. (1988). *The Craig handicap assessment & reporting technique*. Englewood, CO: Craig Hospital.

Whitfield, K. E., Allaire, J. C., Belue, R., & Edwards, C. L. (2008). Are comparisons the answer to understanding behavioral aspects of aging in racial and ethnic groups? *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *63*, 301-308.

Whitfield, K. E., & Baker-Thomas, T. (1999). Individual differences in aging minorities. *International Journal of Aging and Human Development*, *48*(1), 73-79.

Williams, D. A., & Thorn, B. E. (1989). An empirical assessment of pain beliefs. *Pain*, *36*(3), 351-358.

Williams, J. W., Jr., Kerber, C. A., Mulrow, C. D., Medina, A., & Aguilar, C. (1995). Depressive disorders in primary care: Prevalence, functional disability, and identification. *Journal of General Internal Medicine*, *10*(1), 7-12.

Wolinsky, F. D., Ayyagari, P., Malmstrom, T. K., Miller, J. P., Andresen, E. M., Schootman, M., & Miller, D. K. (2014). Lower extremity function trajectories in the African American health cohort. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences, 69*(8), 1004-1010. doi:10.1093/gerona/glt197

Wong, A. L., Harker, J. O., Mittman, B. S., Levy, G. D., Bulpitt, K. J., Colburn, K. K., ... & Rubenstein, L. Z. (2004, August). Development and evaluation of a patient self-report case-finding method for rheumatoid arthritis. *Seminars in Arthritis and Rheumatism*, *34*(1), 484-499.

Zaslavsky, A. M., Beaulieu, N. D., Landon, B. E., & Cleary, P. D. (2000). Dimensions of consumer-assessed quality of Medicare managed-care health plans. *Medical Care*, *38*(2), 162-174.

Zhu, K., Hunter, S., Bernard, L. J., Payne-Wilks, K., Roland, C. L., & Levine, R. S. (2000). Recruiting elderly African-American women in cancer prevention and control studies: A multifaceted approach and its effectiveness. *Journal of the National Medical Association*, *92*, 169-175.