THE ROLE OF PAIN CATASTROPHIZING ON PAIN OUTCOMES IN A RACIALLY DIVERSE GROUP

by

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(Under the Direction of Bernadette D. Heckman)

ABSTRACT

Research has documented disparities in pain outcomes among racial and ethnic minorities in both acute and chronic pain (Flaskerud, 2015; Fillingim et al., 2009; Jablonska, Soares, & Kamp; Sundin, 2006; Green et al., 2003). Similar findings have been noted for disparities in pain catastrophizing, also documented to be associated with poorer pain outcomes (Leung, 2012; Sullivan et al., 2000). Given the noted associations, the primary aim of the study was to assess psychosocial and cultural factors related to chronic pain and the extent to which these factors contribute to pain interference. The proposed study aimed to understand racial disparities in chronic pain by assessing race differences in chronic pain, pain catastrophizing and the degree to which pain catastrophizing uniquely predicts pain outcomes (life quality, disability, frequency, and severity of pain). It was hypothesized that participants who identified as a racial minority would report more undesirable pain outcomes and more pain catastrophizing and that pain catastrophizing would predict pain outcomes among racial minority participants. Data was collected through a Qualtrics Survey of patients recruited from 2 community clinics in Athens, GA. Analyses including Independent Samples T-Test, Multivariate Analysis of Variance, and Multivariate Analysis of Covariance were used to test hypotheses. Results did not support the

notion that participants who identify as a racial minority experience poorer pain outcomes. Rather, data indicated an inverse relationship where Black/African-American particiapnts with chronic pain reported increased quality of life in the social domain. Participants who identified as a racial minority did report more pain catastrophizing, however, this did not predict pain outcomes. More research is needed to further understand racial and ethnic chronic pain disparaties.

INDEX WORDS: pain disparities, pain outcomes, pain catastrophizing, racial/ethnic minority

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DEDICATION

My work and accomplishments are dedicated to those who have supported me. I dedicate this paper to my parents, Derick and Violet Rupnaraine, my husband Alexander Risner, and to my committee chair and advisor, Bernadette Heckman, Ph.D.

Thank you to my parents for your constant love, for all you have done for me, and all you continue to do in supporting my education and career. And thank you Alex for supporting and encouraging me through my education.

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CHAPTER 1

INTRODUCTION

Statement of the Problem

In recent years, chronic pain has become an increasing burden on society as it accounts for a significant portion of health care costs, medical visits, and lies at the origin of the present opioid epidemic (Institute of Medicine, 2011). Pain can be understood as an unpleasant sensory and emotional experience that is associated with actual or potential tissue damage or described in such terms (IASP, 1994). Pain is typically defined as either acute or chronic pain with chronic pain being pain lasting 3 months or longer (Nahin, 2015). Moreover, chronic pain can take many different forms including pain in the back, neck, joints, arms, legs, hands, feet, head, or any combination of this. Chronic pain can arise for a number of reasons related to an injury or from other medical conditions such as, but not limited to, cancer, hemophilia, arthritis, fibromyalgia, nerve damage, and multiple sclerosis. Generally, chronic pain is measured by outcomes of pain such as how often or frequently one experiences pain, intensity or severity of pain, how disabling pain becomes and how it impacts life quality.

Many factors have been noted in the literature to be associated with pain. Demographic factors such as gender, age, race, ethnicity, and SES have been noted to be related to pain outcomes (Flaskerud, 2015; Fillingim et al., 2009; Jablonska, Soares, & Sundin, 2006; Green et al., 2003). Broadly speaking, the literature illustrates that the historically less advantaged groups, such as women, racial and ethnic minorities, and members of lower SES groups tend to report higher pain intensity in both lab induced pain (acute) and in clinical studies of reported chronic

pain (Fillingim et al., 2009; Hsieh, 2010; Rios, 2011). More specifically, research supports the notion that Black and Hispanic individuals experience higher pain severity and more pain disability when compared to non-Hispanic whites in clinical settings (Bolen, 2010). Although the literature does not offer detailed descriptions beyond classifying participants as Black or Hispanic, this offers some foundational insight into pain disparities. In addition, it was noted that Black participants reported greater pain and suffering when compared with whites in conditions such as glaucoma, AIDS, migraine headache, jaw pain, postoperative pain, myofascial pain, angina pectoris, joint pain, non-specific daily pain (Green et al., 2003). Similar findings in clinical samples have been found in Hispanic individuals as well as in American Indians, Alaska Natives and Aboriginal people of Canada, in addition to Asian participants (Jimenez, 2011). Racial and ethnic disparities have also been noted by McLaughlin et al., (2016) with regard to chronic pain frequency and quality of life in young adults with hemophilia. Moreover, with regard to age, there is some conflicting information, however, most literature suggests that older adults likely experience increased pain (Anderson et al., 1993; Lautenbacher et al., 2005; Rittger et al., 2011). This may be due to physical deterioration, but some have also suggested that with age, pain threshold can increase while pain tolerance stays the same. Nevertheless, there is apparent evidence which supports the fact that disparities in pain exist with women, lower SES groups, and minority groups including Black and Hispanics/Latinx individuals who are reportedly experiencing more pain, higher pain severity, more pain disability, and poorer quality of life.

Furthermore, research indicates that pain catastrophizing (PC) is related to undesirable pain outcomes such as more frequent pain experiences, more intense pain, and increased pain disability (Sullivan, et al., 2001). PC is generally understood as a tendency to exaggerate and

ruminate on negative cognitions and emotions one experiences during actual or perceived pain experience, and has roots in cognitive behavioral therapy. It is conceptualized as a form of cognitive appraisal and these thoughts can shape coping behaviors. PC was also noted to be higher in racial and ethnic minority groups, particularly in Black and Hispanic/Latinx minorities who tend to catastrophize more when compared to non-Hispanic whites in samples of individuals with various pain-related medical conditions (Leung, 2012). Similar findings have been noted in laboratory experiments where Blacks reportedly experienced more PC than white-Americans (George et al. 2008). On the contrary, it has been documented that Asian patients tend to normalize their experience of pain rather than catastrophize (Kwok & Bhuvanakrishna, 2014). Although there is some literature to document disparities in PC, this information is limited. Nonetheless, there is also empirical evidence to support the notion that PC can predict pain outcomes (Sullivan et al., 2001).

Taken together, there is literature to support the notion that racial and ethnic disparities in pain outcomes exist, and, as Green et al., (2003) illustrates, there is a need for further research regarding pain disparities among racial and ethnic minorities. Furthermore, although limited, there is noted evidence of disparities in PC with regard to race and ethnicity. Chronic pain has developed into an increasingly problematic issue in our society given the increased cost in medical services related to pain as well as the present opioid epidemic. While the opioid epidemic was initially characterized by overuse of prescription medications for pain in whites, more recent reports indicate that Blacks are abusing opioids for pain at rates similar to that of white Americans (Harrison et al., 2018). Given the racial and ethnic disparities in pain outcomes and PC, in addition to the societal difficulties chronic pain carries, this can be characterized as a social justice issue. According to the previously cited literature, most minority individuals are

experiencing more pain severity, more often, with more disability, and poorer life quality. Exploring mechanisms that can potentially account for this relationship will offer valuable information to the work and services counseling psychologists provide in addition to offering guidance which healthcare providers can use in healthcare delivery to patients of color.

Purpose of the Study

The purpose of this study is to advance the understanding of racial and ethnic disparities in pain outcomes by examining the relationship between pain catastrophizing and pain severity, disability, frequency, and life quality among Black and Hispanic/Latinx individuals with diagnosed chronic pain conditions. Specifically, the study will focus on persons with chronic pain who self-identify as Black and/or Hispanic/Latinx as these groups have been found to be disproportionately impacted by pain-related problems. To date, very little is known about PC and its relationship to chronic pain characteristics in racially diverse groups. The limited research on pain and race have been largely focused on experimentally-induced acute pain situations that ignore the psychosocial adaptation challenges associated with chronic pain conditions (Fabian, McGuire, Goodin, & Edwards, 2011). The primary aim of the present study is to assess psychosocial and cultural factors related to chronic pain and the extent to which these factors contribute to pain interference in daily social, work, and family functioning. The proposed study will examine race differences in catastrophizing and the degree to which pain catastrophizing uniquely predicts pain outcomes (e.g. life quality, disability, frequency, and severity of pain) among self-identified Black and/or Hispanic/Latinx minority participants. According to the literature there are many other factors which could potentially also impact pain outcomes (Litt & Tennen, 2015; Beesdo et al., 2010; Montoya et al., 2004). The present study will examine the role of pain catastrophizing in light of other factors related to pain outcomes (e.g. social support,

depression, coping). The current study will also explore how the experience of racism (e.g. microaggressions) contributes to pain outcomes in this racially diverse sample of individuals with chronic pain disorders. With this in mind, the following research questions are proposed:

1. Do participants who self-identify as a racial/ethnic minority (e.g. Black and Hispanic/Latinx) experience greater pain severity, disability, frequency, and pooer life quality?
2. Do participants who self-identify as a racial/ethnic minority (e.g. Black and Hispanic/Latinx) experience more PC?
3. Does PC predict pain outcomes above and beyond anxiety, depression, social support, coping, age, gender, and SES?
4. Exploratory question: Is perception of racism related to pain outcomes and/or PC?

Understanding disparities in pain is a significant area of focus given the high prevalence of pain experience and tolling impact in our society today. As previously noted, the racial and ethnic pain disparities noted suggest a social justice concern.

The work of Helms (1990) highlights the significance of understanding racial identity through the manner in which individuals are cognitively, affectively, and motivationaly affected by the appraisals that others make about them in addition to the appraisals they make about themselves. Her work also emphasizes the importance of understanding these psychological effects of racism when it comes to further understanding of health disparities and suggest that the key to bridging gaps in health disparities lie in this exploration (Helms & Mereish, 2013). Moreover, Meyer and Frost (2013) also issultrate the significance of understanding minority stress in being able to bridge the gap in any minority health disparities.

Moos and Shafer (1984) present a model for conceptualizing how individuals cope with physical illness. Their model takes into account, the role that background, personal characteristics, demographic factors, illness related factors, and social environment factors play in shaping cognitive appraisals including how individuals assess the situation of their illness and how they cope. These factors in turn influence health outcomes. Similar to this model, Clark et al. (1999) published on a similar model titled *A Contextual Model to Examine the Biopsychosocial Effects of Perceived Racism*. This model is similar to Moos and Shafer's model as it presents the notion that health outcomes are influenced by the same factors previously noted, however, this model includes perception of racism as an additional factor which also shapes how individuals cope with stressors, and thus how it impacts health outcomes. Coupled with the work of Helms (1990), these theories conclusively highlight the importance of cognitive appraisal of not only resources and ability for coping with illness, but also on how racial identity factors are perceived.

Moreover, the previously noted theories provide a solid foundation for exploring the role of cognitive appraisals in understanding chronic pain outcomes. Specifically, examaining the role of PC in addition to perception of racial/ethnic discrimination will offer insighs to support further efforts in bridging the racial and ethnic gaps in chronic pain disparaities. Driven by the literature discussed in addition to the theories presented by Moos and Shafer (1984) as well as by Clark et al. (1999), the following is hypothesized:

1. Participants who self-identify as a racial/ethnic minority (e.g. Black, Hispanic/Latinx) will experience greater pain severity, disability, frequency, and life quality.
2. Participants who self-identify as a racial/ethnic minority (e.g. Black, Hispanic/Latinx) will experience greater pain catastrophizing.

3. Pain catastrophizing in participants who self-identify as a minority will predict pain outcomes above and beyond anxiety, depression, social support, coping, SES, age, and gender.
4. Exploratory Hypothesis: Perception of racism will be related to pain outcomes and pain catastrophizing.

Definition of Terms

Black. For the purposes of this project, Black will refer to a description of Black, African-American, Black American, and Caribbean Black individuals.

Chronic Pain. A bodily sensation of pain persisting for 3 months or longer (Nahin, 2015).

Hispanic/ Latinx- For the purposes of this project, Hispanic/Latinx will were to individuals identified as Hispanic, Latino, Latina, Latinx, Chicano, Chicana, Chicanx.

Pain. A subjective and unpleasant sensory and emotional experience that is associated with actual or potential tissue damage or described in such terms(IASP, 1994).

Pain Catastrophizing. a tendency to exaggerate and ruminate on negative cognitions and emotions one experiences during actual or perceived pain experience, and has roots in cognitive behavioral therapy (Sullivan, 1995).

Pain disability. The degree to which pain interferes with daily life activities (Tait, 1990).

Pain Frequency. How often an individual experiences pain, number of pain days in a given timeframe (Younger, McCue, & Mackey, 2009).

Pain Intensity. The subjective sensory experience of an individual's pain (Younger, McCue, & Mackey, 2009).

Pain Outcomes. Refers to factors such as pain frequency, intensity and severity of pain, life quality, and pain disability (Younger, McCue, & Mackey, 2009).

Quality of Life. An individual's perception of their position in life in the context of culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns (WHOQOL, 1998).

White. For this project, white will refer to individuals described as White, Caucasian, and European.

CHAPTER 2

REVIEW OF THE LITERATURE

Chronic Pain

Chronic pain has become a significant problem in the United States as well as globally. Quartana, Campbell, and Edwards (2009) describe pain as the fifth vital sign. Although the subjective nature of pain has created some controversy regarding pain as a vital sign, the mere fact that it is commonly assessed along with traditional vital signs such as blood pressure, pulse, respiration, and temperature speaks to the pervasiveness of chronic pain (Straub, 2017). Further, Quartana, Campbell, and Edwards (2009) describes pain as a symptom which accounts for 80% of physician visits in addition to costing around 100 billion dollars per year in healthcare expenditures and lost productivity. More recent reports describe pain to cost the United States around $600 billion annually (Institute of Medicine, 2011). According to the American Academy of Pain Medicine (2013), it is estimated that over 100 million Americans are affected by chronic pain. Epidemiologists report that in the United States, just over 11% of the population, around 25.3 million adults, and 10% of the world's population suffer from some type of daily chronic pain which was defined as pain within the last 3 months (Nahin, 2015). This study also found that individuals who had reported more frequent and intense pain were more likely to have poorer health. In addition to the staggering numbers noted, issues surrounding chronic pain are

even more severe given the declared opioid epidemic. In 2017, the U.S. Department of Health and Human Services declared a public health emergency due to increased misuse of prescription opioid pain relievers as well as a significant increase in death by opioid overdose. Given the significant impact of pain in our society, there is significant need to further pain research and promote effective pain management.

One of the most widely used definitions of pain was put forth by the International Association for the Study of Pain (IASP). IASP (1994) defines pain as an unpleasant sensory and emotional experience that is associated with actual or potential tissue damage or described in such terms. This definition characterizes pain as a subjective experience relayed by each individual. Pain can be characterized as either acute or chronic. Acute pain is typically sharp or stinging pain in a localized area. This type of pain is usually an indication of injury and will subside as the body heals. Although some conceptualize chronic pain as pain persisting 6 months or longer, many studies cited characterize chronic pain as lasting 3 months or longer (Nahin, 2015; Hardt et al., 2008; Kennedy et al., 2014). Research regarding chronic pain typically assess chronic pain on outcomes across multiple dimensions including pain frequency, pain severity or intensity, pain disability, and quality of life (Younger, McCue, & Mackey, 2009). Pain frequency refers to how often one experiences pain which pain severity and intensity and both ways of indicating the sensory experience and intensity of pain. Disability and quality of life are dimensions of chronic pain assessment which focus on the impact pain has on an individual's abilities in daily living and the extent to which the individual is satisfied with their life,

respectively. Chronic pain will typically begin to affect aspects of daily living such as sleep, mood, and activity, and thus has been shown to decrease quality of life (Turk & Okifuji, 2002).

Chronic pain has been noted to take many forms and can affect any part of the body. A commonly used system for classifying pain is to identify pain as nociceptive, neuropathic, or headache pain. Nociceptive pain is caused by damage to body tissue in muscles, bones, tendons, and ligaments and is based on information carried from nerves. Most nociceptive pain is musculoskeletal and commonly described as aching or deep pain. Neuropathic pain is understood as pain caused by actual nerve damage and is often described as burning, shooting, tingling, or electric pain. With the exception of headache, pain throughout the body can be identified as either nociceptive or neuropathic pain. Headache pain is viewed to be pain around the brain structures and can be in the forehead, eyes, upper back and neck areas also.

Some common types of chronic pain include back pain, that may fall in any region ranging from the neck to lower back. Although reports vary, neck pain and low back pain are believed to be the most common types of pain with some studies estimating 10% of American suffering from low back pain and the most costly worldwide when considering medical visits and loss of work productivity (Deyo & Weinstein, 2001; Hardt, 2008). It is also estimated that 65% of the population will experience neck pain at some point in their lives (Murphy et al.). Back pain in other areas are viewed as less common forms of back pain. Pain can also be experienced as a result of arthritis which affects joints, the end of bones, cartilage, ligaments and/or tendons. Finally, headaches are another common form of pain which affects many people with tension-

type and migraine headaches being the most common (ICHD, 2nd edition, 2004)). Hardt (2008) also proposed that 7.1% of the population and 4.1% experience pain in the legs/feet and arms/hand, respectively. Headaches were estimated to affect 3.5% of the population.

Factors Associated with Pain

Gender. Disparities in gender have also been noted in pain reports. Generally speaking, it is regarded that women tend to report more frequent and severe pain as compared to men. Bartly and Fillingim (2013) address pain in both clinical (chronic pain) and laboratory (acute pain) samples and also present gender differences in pain noting women as having more frequent and intense pain when compared to men. More specifically, in laboratory findings which assessed acute pain, women were found to have a lower pain threshold and tolerance for pain (Fillingim et al., 2009). Edwards (2004) provide evidence to support differences in men and women with regard to chronic pain frequency and intensity. According to this study, in a primary care setting, women report more chronic pain more often than men and also report greater pain severity when compared to men. Similar findings with regard to chronic pain were also found by Anderson et al. (1993) in a sample of the general population where women reported more chronic pain with multiple locations including pain in the neck, shoulder, arm, and thigh to a greater extent than men. A noteworthy study regarding gender disparities in pain was conducted at Stanford University and contained over 12,000 patients who were assessed for pain from over 250 diseases and conditions including diabetes, arthritis, respiratory infections and fibromyalgia, to name a few. The results showed that for nearly every diagnosis, women's pain scores were

calculated to average 20% higher than men's scores (Ruau, Liu, Clark, Angst, & Butte, 2012). Finally, Vigil, Rowell, & Lutz (2014) assessed pain in women and found that lesbian and bisexual women reported lower pain intensity ratings and were found to have higher pain threshold and tolerance when compared to heterosexual women. This study is interesting given that it suggests a potential gender role or stereotype associated with pain. Nonetheless, there are noted gender differences in pain, and for this reason, it is important to attend to such a variable when assessing outcomes of pain.

Age. There is more conflicting data regarding age and pain. Some studies have found the prevalence of pain increased for both men and women with age while other studies have found the opposite to be true (Anderson et al., 1993; Lautenbacher et al., 2005; Rittger et al., 2011). These difference have been noted in both laboratory (acute) as well as clinical samples which assessed chronic pain. More recent literature suggests that pain threshold increases with age (Lautenbacher et al., 2017). This metanalysis assessed 31 studies on pain threshold and 9 on pain tolerance and found that while pain threshold increases with age, pain tolerance stays about the same as individuals age. One study investigated pain in adults over the age of 65 and found that 52.9 % of them experienced some form of bothersome pain. 75% of these participants reported chronic pain in areas including their back, knees, and hips. A strength of this study is that it controlled for cognitive performance, dementia, and residential-care living when assessing pain. The results of this study speak to the prevalence of pain reports with regard to age. Overall, while there is some conflicting evidence regarding age and pain, there is evidence to indicate

some differences in older verses younger adults with regard to pain reports. As such, age should be a variable of consideration when researching pain.

Socioeconomic Status (SES). Factors such as socioeconomic status (SES) have been found to be related to pain outcomes. Research suggests that lower SES is associated with more frequent reports of chronic pain, higher pain severity, more pain disability, and poorer quality of life (Jablonska, Soares, & Sundin, 2006; Feldman et al., 2015). A European study assessed the relationship between factors of SES and pain disability in individuals with chronic pain (Dorner, 2011). SES was assessed with consideration of education level, income and profession and factors including age, gender, pain intensity, and disease for adjusted for in statistical analyses. Results of this study indicated that perception of pain disability was related SES as participants in the lowest SES group was 2-3 times more likely to feel disabled by pain. Similarly, another study found that financial worry predicted chronic pain severity (Rios, 2011). Access to healthcare and having health insurance was also examined with regard to pain and results indicated lack of health insurance is associated with higher chronic pain intensity (Eberly et al., 2018). Feldman et al. (2015) also assessed SES in terms of income, wealth, education, and crowding within a household and found that lower SES was related to more pain, lower pain functioning, and poorer quality of life. While these studies looked at different types of chronic pain, this information consistently illustrates the presence of an association between lower SES and undesirable pain outcomes. Given this conclusion, the present study aims to control for SES when assessing outcomes of pain related to self-identified minority status.

Race and Ethnicity. There is a plethora of data which supports the notion that race differences in pain exist for both chronic and acute pain (Rahim-Williams et al., 2007; Edwards & Fillingim, 1999; Edwards et al., 2001). It has been consistently documented that Black and Hispanic/Latinx Americans reportedly experience more intense pain in clinical as well as in laboratory studies.

In laboratory studies assessing acute pain from heat, cold, and pressure, pain tolerance and pain threshold has been found to be lower in Black and Hispanic Americans when compared to white-Americans (Campbell & Edwards, 2012; Rahim-Williams et al., 2007). With regard to pain in Asian participants, there is rather limited data. An older study noted that Asians had lower pressure pain tolerance compared with Caucasians and a study with children also found that Asian participants demonstrated more pain sensitivity than Caucasians (Lu, Zeltzer, & Tsao, 2013; Woodrow, Friedman, Siegelaub, & Collen, 1972). A more recent study suggests that Asian–Americans have lower pain thresholds and tolerance when compared with non-Hispanic/Latinx whites (Rowell et al., 2011). Regarding South-Asians, there evidence to suggest higher acute pain in these individuals when compared to British participants (Watson, Latif, & Rowbotman, 2005). Overall, while there is consistent data regarding acute pain disparities in Black and Hispanic/Latinx Americans, there is limited data regarding these disparities in individuals who identify as Asian, and in some cases, this data varies based on Asian sub-cultures.

Corresponding results have been found in minority groups with regard to chronic pain. In one study, Black participants reported greater chronic pain in conditions such as glaucoma, AIDS, migraine headache, jaw pain, postoperative pain, myofascial pain, angina pectoris, joint pain, non-specific daily pain and arthritis, compared with whites (Green et al., 2003). Blacks were also noted to have higher levels of chronic pain sensitivity compared to whites (Shavers, Bakos, & Sheppard, 2010). Further, greater pain-related symptoms and disability have been noted in Black patients when compared to white patients at multidisciplinary pain centers (Green, Baker, & Sato, 2003). Further, some evidence suggests that disparities between these groups appear to be independent of other demographic factors such as age, sex, socioeconomic status, education, employment, marital status and other potential confounders, such as medical comorbidities and disease duration (Mechlin, Heymen, Edwards, & Girdler, 2011; Bruce , Fries, & Murtagh, 2007). It has also been demonstrated that Black cancer patients are more likely to experience poorer quality of life due to chronic pain when compared to whites with cancer (Lubeck, Kim, & Grossfeld, 2010). Similar findings have also been noted for Hispanic/Latinx-Americans and South Asians as well with these minority groups indicating more pain intensity (Watson, 2005; Hsieh, 2010). More specifically, a metaanalysis focused on chronic pain in Hispanic/Latinx Americans demonstrated consistent findings that they report more pain frequency, severity, and disability when compared to white Americans, and in some cases more undesirable pain outcomes when compared to Black participants (Hollingshead, Ashburn-Nardo, Stewart, & Hirsh, 2016). Regarding life quality, there is some conflicting evidence with regard to

chronic pain. Some evidence has demonstrated poorer life quality in Hispanic/Latinx participants while other studies have shown other gender role factors to play a role in quality of life of Hispanic/Latinx participants (Im, Guevara, & Chee, 2007; Juarez, Ferrell, & Borneman, 2001; Juarez, Ferrell, & Borneman, 1999). Bolen et al. (2010) assessed patients with arthritis and found that arthritis-attributable activities, work limitations, and severe joint pain were reported higher for participants who identified as non-Hispanic blacks, Hispanics and 'multiracial' or 'other' when compared with their non-Hispanic white counterparts. This data suggests more pain disability and poorer life quality with regard to chronic pain these groups. Data on chronic pain in Asians is limited. There is however, some research which has demonstrated more pain frequency in Asian participants. In particular, one study noted that South Asians reported more chronic pain in multiple body locations when compared to whites (Allison et al., 2002). Another study exploring discrimination in Asian Americans would that discrimination was associated with more frequent and severe headaches as well as more chronic body pain particularly in the neck and back (Gee, Spencer, Chen, & Takeuchi, 2007). Even though there is some data illustrating increased prevalence of pain in Asian individuals, there is minimal data regarding other pain outcomes, such as disability and quality of life, in this population.

Although there is significant evidence to support the notions that racial and ethnic minorities experience more pain, some studies have actually found that Whites experience more pain frequency and severity when compared to racial and ethnic minorities (Kennedy et al., 2014; Hardt, 2008; Johannes, 2010). Nahin (2015) addresses this discrepancy and noted the

possibility that the differences can be attributed to variability in how the outcomes of pain were assessed, how pain was conceptualized, and in the samples used which might actually represent pain disparities related to age, gender, and SES. Moreover, the data from this work provides evidence for differences in pain severity based on race and ethnicity with minority groups likely experiencing more pain severity.

Green et al. (2004) also made the claim that racial and ethnic disparities in pain exist in pain perception across varying types of pain including laboratory, acute, chronic nonmalignant, and cancer pain. This literature takes these noted disparities a step further and also claim the complexity of racial and ethnic disparities through the fact that it likely involves patient and provider communication in addition to access to healthcare resources and treatments. Their work illustrates a potential explanation for the disparities in pain also by the notion that it can be explained by unequal burdens faced by minorities. It is also likely that patient provider communication may also speak to perceptions of racism and discrimination in minorities. This may also be a potential factor impacting communication and thus can impact outcomes related to pain. Carlisle (2014) aimed to assess perception of discrimination among ethnic and racial groups and subgroups and the impact this had on chronic pain among a variety of chronic health conditions. Results of this work found that perceived discrimination was related to chronic pain for Hispanic/Latinx American participants. This illustrates the potential for discrimination as a factor impacting chronic pain.

Depression and Anxiety. Although underlying mechanisms regarding the association between pain and mood are unclear, it is accepted that mood disturbance is related to chronic pain (Beesdo et al., 2010). It is widely accepted that anxiety and depression are related to pain chronicity (Sheng, Liu, Wang, Cui, & Zhang, 2017; Heer et al., 2014). Generally speaking, depression is the most prevalent mental health problem noted in individuals with chronic pain, and reportedly anxiety fall second. It is suggested that depression and anxiety, play an important role in the exacerbation of pain perception which was noted in all clinical settings (Woo, 2010). Katona et al., 2005 suggest that between 30% and 65% of patients with chronic pain also struggle with depression. In another study exploring factors related to pain in patients with knee osteoarthritis, review of records indicated that patients taking antidepressant medications, and having a diagnosis of depression was associated with more pain severity (Eberly, 2018). Research also demonstrates that problems with mood are also related to experience of pain with individuals who are anxious, worried, fearful, pessimistic, and/or depressed having a higher pain frequency (Leeuw et al., 2007). Longitudinal studies assessing depression and both depression and anxiety together indicate that patients with depression and anxiety are between 2 to 5 times more likely to develop new chronic pain conditions at follow-up ranging from 1 to 8 years later. This finding persists even when considering research suggesting that individuals with depression appear to be less sensitive to pain in response to laboratory stimuli (acute pain) compared with healthy controls (Currie, 2005; Hotopf et al., 1998; Dworkin et al. 1995). Moreover, Tang et al. (2008) studied chronic back pain patients under experimental conditions and found that induced

negative mood increases self-reported pain and decreases tolerance for a pain-relevant task, and also found the opposite to also be true with induced positive mood having higher pain tolerance and lower self-reported pain. Another study found that depression was more prevalent in individuals with low back pain as compared to the general population (Williams et al., 2006).

In addition to this, another recently published study compared patients with rheumatoid arthritis and a group of patients without arthritis in the context of anxiety, depression, pain sensitivity, and QOL. Results of the study found that 55% of patients with rheumatoid arthritis had anxiety and 38.6% had depression which was significantly more than those who did not have arthritis. These patients also reported a higher pain intensity and a lower quality of life in all areas of the WHOQOL-BREF (Muller et al., 2017). Further, Woo (2010) noted that depression was commonly a result of chronic pain and also negatively impacted quality of life. Furthermore, Woo (2010) demonstrates how depression and anxiety are related to a poorer prognosis regarding chronic pain. His work illustrates the notions that higher rates of anxiety and depression involve more maladaptive cognitions and behaviors which likely lead to more disability and poorer life quality related to chronic pain.

Some view fear as related to catastrophizing, fear is viewed to be associated with chronic pain and a prognosis of poorer pain outcomes (Leeuw et al., 2007; Turk & Wilson, 2010). Other studies have also linked fear of pain in pain-free individuals with the risk of subsequently developing chronic pain complaints at a later time (Severeijns, 2005). Reportedly, this pain-related fear causes individuals with pain to overpredict the severity of pain they will experience.

This results in engagement of avoidance behavior, which can lead to increased pain frequency (Sheng, Liu, Wang, Cui, & Zhang, 2017).

In conclusion, the noted literature illustrates an association between depression and pain as well as anxiety and pain. Although we know the association exists, Martucci (2017) depict the need for further research in understanding the mechanisms of association between mood and pain and how this connection can be explained. Nevertheless, this association illustrates the need to consider these variables in the context of exploring pain outcomes.

Social Support. Perceived social support is one factor which is theorized to have some impact on adjustment to chronic pain as well as pain intensity, disability, and frequency (Lopez-Martinez, Esteve, & Ramirez, 2006; Harris, Morley, & Barton, 2003; Jamison & Virts, 1990). Generally speaking, literature regarding social support and pain suggests that higher social support is associated with less pain. However, the literature on social support and pain varies based on the way social support is operationalized (Burri, Gebre, & Bodenmann, 2017). Some researchers describe social support as involving whether the individuals have social supports who can assist them in pain management while other researches have looked at social support in terms of having social contacts as a form of distraction. Ironically, the latter is associated with less pain while the former has been found to be associated with more pain (Burri, Gebre, & Bodenmann, 2017). A study exploring social support and pain processing in patients with fibromyalgia found that patients in the presence of a significant other reported less pain frequency and intensity (Montoya et al., 2004). One study assessed social support preferences

with regard to disability and found that there was no influence of pain disability on social support preferences. The study suggests that more information is needed to assess the pain-related support preferences and disability (McWilliams et al., 2014). Generally speaking, increased social support suggests more positive quality of life (LaRocca & Scogin, 2015). In regards to chronic pain, research has examined the role of social support in patients with chronic cancer pain which provided evidence to indicate that both objective and subjective measures of social support were related to physical quality of life (Wang et al., 2015). Further, in a study of patients with chronic arthritis pain, social support appeared to play a significant role in the impact of pain, pain disability, and as a result, overall quality of life (Blixen & Kippes, 1999). In considering the complexity of social support and pain, Gil et al., (1987) propose an operant conditioning conceptualization of social support and pain. Results of their study showed no significant difference in pain behaviors between those who have high versus low levels of available social support. There also were no noted differences between high versus low social support groups in pain ratings. Given this data, the researches proposed that individuals who are satisfied with the quality of their social support may be satisfied because they receive positive reinforcement from the social environment when they engage in pain behavior. This theory offers another factor to consider in terms of social support and reinforcement. In conclusion, there are some varying claims regarding social support and pain outcomes and for this reason, social support will be considered when exploring factors related to outcomes of pain.

Quality of Life. Studies illustrate chronic pain as a factor which impacts quality of life (QOL). In one study the World Health Organization Quality of Life-Brief Version (WHOQOL-BREF) was used to compare how quality of life compared in groups of individuals with chronic low back pain and those without chronic pain, considered by the study as healthy individuals. The results of this study clearly indicated the participants with low back pain had lower scores on the WHOQOL-BREF as compared to individuals without chronic low back pain. Results from this study reflect the notion that QOL is lower in individuals who struggle with chronic pain (Darzi, Pourhadi, Hosseinzadeh, Ahmadi & Dadian, 2014). Similarly, another study assessed QOL based on pain severity and found that mild pain severity as noted on the Visual Analog Scale was associated with lower QOL in 3 of the 4 domains, physical health, social relationships, and psychological health (Salik, Ozge, & Segvi, 2013). Associations regarding quality of life, chronic pain, and depression have also been noted with one study finding 52% of participants having comorbid chronic pain and major depressive disorder in addition to lower quality of life (Elliot et al., 2003). Taken together, the noted literature illustrates how QOL is impacted by pain and thus, this study strives to further assess QOL as an outcome of pain.

Pain Catastrophizing. There is sufficient literature which links pain catastrophizing (PC) to pain intensity, frequency, and disability (Sullivan et al., 2001). The term catastrophizing was initially presented by cognitive behavioral psychologists Albert Ellis and Aaron Beck to describe a form of maladaptive cognitions in patients struggling with anxiety and depression (Leung, 2012). Subsequently, PC can be understood as a tendency to exaggerate and ruminate on

negative cognitions and emotions one experiences during actual or perceived pain experience whether pain is acute or chronic (Leung, 2012; Quartana et al. 2009).

PC can be viewed as one of the most significant psychological predictors of pain experience (Sullivan et al., 2001). The association between PC and pain experience has been confirmed in a number of diverse patient groups who vary based on age well as race, ethnicity, and gender in individuals with a variety of chronic pain experience including mixed chronic pain, low back pain, and arthritis to name a few (Flor et la, 1993; Sullivan & Deon, 1990). Furthermore, catastrophizing has also been found to be linked to pain behavior, such as help-seeking, as well as illness behaviors including efforts to manage pain symptoms (Sullivan et al., 2001). These findings have been found in both clinical and laboratory samples including patients with acute and chronic pain such as chronic pain from arthritis and fibromyalgia as well as patients with recent knee replacement surgery (Nicassio, 1995;). Similar findings have also been noted in laboratory studies assessing acute pain induced through cold pressor test (Sullivan, 2000). It is also theorized that PC plays a detrimental role in the adaptation to chronic pain. Craner et al. (2016) assessed outcomes of a pain rehabilitation program targeting PC. The results of this study indicated that PC decreased following the end of treatment, and the variance in the reduction of pain outcomes could also be explained by PC. Furthermore, PC has been found to be linked to pain disability in a number of different ways. Studies have found PC to be related to physical and mental impairment as well as having an effect on social and occupational functioning suggesting pain disability and poorer life quality (WHO, 1996; Sullivan & Loser,

1998). In addition, this link has been confirmed in varying types of chronic pain as well as with varying conceptualizations of pain disability (Martin, 1996; Sullivan, 1998).

Generally speaking, PC is considered maladaptive given its association with increased pain. There are various reasons why PC can be considered a maladaptive response to pain. First, PC has been found to be associated with a more intense experience of pain as well as depression (Sullivan, 1990). Research also illustrates PC to be related to higher self-reported pain and disability, and is also correlated with poorer prognosis of pain (Wertli, et al., 2014). To further strengthen the notion of PC being maladaptive, there is evidence indicating that lower levels of PC is associated with better outcomes in pain treatment (Wertli et al., 2014). Negative beliefs about pain, can result in an individual thinking about the worst outcomes regarding pain during actual, or anticipated experiences of pain which can lead to further fear and avoidance. Given this idea, PC is considered maladaptive due to the idea it comes with pain related fear and thus avoidance of daily living such as chores, physical activity and engaging with others in addition to over monitoring of bodily sensations (Neblet, 2017). As a consequence of this, these individuals likely experience problems such as depression, disengagement in social activities and interaction, problems with work as well as physical deconditioning. Additionally, research evidence indicates this fear avoidance associated with PC is associated with increased pain, physical disability, and long term sick leave in chronic pain patients (Gatchel, 2007). It is also suggested that catastrophizing may play a role chronicity of pain as more catastrophizing is likely associated with long-term pain (Pincus, et al. 2002). Overall, the literature presented clearly

illustrates a link between PC and chronic pain as noted my its indicated impact on pain frequency, severity, disability and life quality.

Pain Coping. A commonly used conceptualization of coping comes from Lazarus and Folkman (1984) who define coping as an individual's cognitive and behavioral efforts in responding to stressors. They theorize that this behavior follows from moments of appraisal where the stressor is assessed.

Much of the literature on chronic pain and coping categorizes coping style based on the coping behaviors as well as outcome. These styles are usually compared to assess for more effective verses less effective ways of coping. A few common categories for coping behaviors include problem-focused vs. emotion focused coping, maladaptive vs. adaptive coping, and active vs. passive. In a sample of rheumatoid arthritis patients, white patients reported ignoring pain and using coping self-statements. These statements in the end were associated with greater perceived ability to control pain and characterize a more 'active' style of coping. On the other hand, the study found that Black patients reported greater use of the 'passive' pain coping strategies such as distraction and praying/hoping and these were found to be connected to more unwanted pain outcomes (Jordan, Lumley, & Leisen, 1998). Additional studies have also documented that in patients suffering from chronic arthritis pain, those who engaged in more 'passive' pain coping, for example avoidance, experienced more pain related limitations at a 5 year follow-up study (Holla et al., 2015). The results of this study suggest the presence of more pain disability and lower lie quality in those who use more 'passive' styles of coping. Moreover,

a study which utilized the Pain Coping Inventory in a sample of individuals with chronic neuropathic pain found evidence to support the idea that 'active' pain coping improved pain intensity and pain related disability (Heutink et al., 2013). Additional research evidence illustrated that when chronic pain conditions were viewed and responded to as problematic, it led to increased unwanted pain outcomes. Further, the adaptive coping strategies were not found to be associated with negative interpretations of chronic pain (Bussing et al., 2010).

Although there is a general idea that active coping is inversely related to undesirable pain outcomes, the subscales studies have used to operationalize coping styles vary. This variation regarding coping styles is strengthened by the work of Skinner, Edge, Altman, and Sherwood (2003) who aimed to understand the structure of coping. Their work revealed that over a hundred different category systems for coping exist with no 2 containing the same set of categories. This data illustrates some flaws in the system of understanding pain and coping. Similarly, Litt and Tennen (2015) propose that there is no "best" way to cope with chronic pain and suggest that the best coping style is dependent on the context and situation of each individual in addition to having more stable traits. Although some are likely to view PC as a form of pain coping, Litt and Tennen (2015) also emphasize that the differences between catastrophizing and coping. They note that this can be described, based on Lazarus and Folkman's (1984) definition of coping, as efforts to ameliorate stress rather than a reaction to pain. Further, they describe catastrophizing in the following words "…an exaggerated negative cognitive appraisal in response to a stressor, while an important construct, is not an example of coping." Overall, these notions illustrate PC

as a significant construct in understanding pain as it can be viewed as independent of other forms of coping. Given this information, this study strives to assess coping independently from PC.

Relevance of the Study: Racial/Ethnic Disparities in Pain Catastrophizing

This study aims to assess psychosocial and cultural factors related to chronic pain and the extent to which these factors contribute to pain interference in daily functioning. The proposed study will examine race differences in catastrophizing and the degree to which pain catastrophizing uniquely predicts pain outcomes in addition to the examining the perception of racism in as it relates to PC and pain outcomes. There is some literature which supports race differences in catastrophizing. One study noted that Black participants experienced more PC than white Americans in laboratory experiments assessing PC in acute pain (George et al. 2008). Moreover, another study found that race differences in acute pain sensitivity were partially due to differences in the use of catastrophizing (Meints & Hirsh, 2015). Similar findings have also been noted in studies of chronic pain. In particular, a study assessed PC in patients with osteoarthritis and found that PC was higher in Black participants when compared, again, to non-Hispanic/Latinx, white participants (Walker et al., 2016). Further, Leung (2012) has documented disparities in PC and noted that Black and Hispanic/Latinx -Americans were noted to catastrophize significantly more compared to white Americans. The results carry over into experiments of acute pain such as in laboratory experiments where Black participants reportedly experienced more PC than white-Americans (George et al. 2008). A Canadian study assessed the relationship between race and sex differences in PC and found that Chinese-Canadians

experienced more PC when compared to European-Canadians (Forsythe, 2011). Nevertheless, it has been documented that Asian patients tend to normalize their experience of pain rather than catastrophize and suggest the opposite to be true (Kwok & Bhuvanakrishna, 2014). Overall, although minimal, there is some consistent research evidence which supports the notion that Black and Hispanic/Latinx -Americans catastrophize in response to pain more than their white counterparts, the data regarding PC in Asians is limited and somewhat conflicting.

Furthermore, to date there are only a couple known studies that have particularly examined the role of PC in the relationship between race and pain outcomes (Meints & Hirsh, 2015; Fabian, McGuire, Goodin, & Edwards, 2011). Both of these studies illustrate PC's connection to poorer pain outcomes including lower pain tolerance and higher pain sensitivity in minority participants when compared to white participants. Nevertheless, these studies were laboratory cold-pressor experiments and thus, examined PC in response to acute pain rather than chronic pain. Additionally, both these studies only assessed pain outcomes including pain intensity, tolerance, and threshold, which typically characterize studies of acute pain. Further, these studies were both assessed in samples of young adults, particularly college students. Given these limitations, the present study strives to confirm Black and Hispanic/Latinx -Americans racial and ethnic disparities in PC as well as assess PC's role in the relationship between these minority groups and pain outcomes (life quality, disability, frequency, and severity of pain) while controlling for other factors including demographics, anxiety, depression, social support, and coping which could potentially also affect pain outcomes. In addition, the current project

intends to explore pain outcomes based on clinical samples who report chronic pain as compared to laboratory samples where the pain assessed is induced and acute. Assessing these factors in a clinical sample speaks to the quality of more accurate results regarding chronic pain in minority populations and can better inform chronic pain management.

Taken together, this research project strives to answer the following questions.

1. Do participants who self-identify as a racial/ethnic minority (e.g. Black and Hispanic/Latinx) experience greater pain severity, disability, frequency, and life quality when compared to white-Americans?
2. Do participants who self-identify as a racial/ethnic minority (e.g. Black and Hispanic/Latinx) experience more PC than white-Americans?
3. Does it PC predict pain outcomes above and beyond anxiety, depression, social support, coping, age, gender, and SES?
4. Exploratory question: Is perception of racism related to pain outcomes and/or PC?

Disparities in Health Outcomes

As noted in Chapter 1, Moos and Schaefer (1984) present a model for understanding the crisis of physical illness. Built from a biopsychosocial framework, this model postulates that background and personal characteristics of an individual in addition to illness related factors and social environment factors work together to impact an individual's cognitive appraisal for coping with a physical illness. Behaviors in response to the physical illness and appraisal are then carried out and these factors together impact the outcome of the crisis illness. More specifically,

Moos and Schaefer's model refers to demographic to include age, gender, and socioeconomic status, and personal factors refer to cognitive and emotional maturity, self-confidence, spirituality in addition to prior illness and past experiences with particular coping behaviors. This portion of the model also considers developmental stage as a personal characteristic which can impact the reaction to the illness. For example, an adolescent who was about to enter into more independence, but is now facing challenges related to development of physical illness and requires constant attention and regular medical treatment. While Moos and Schaefer do not mention race and ethnicity in their description of demographic and personal factors, we can infer that these factors fit within this portion of the model as race is considered as a demographic factor and ethnicity and culture also shape personal characteristics. Illness-related factors are viewed as the type and location of symptoms including whether the illness is painful, disfiguring, disabling, or in a body region such as reproductive organs or the heart which holds more significance for life and survival. Overall, this section of the model gives attention to illness-related factors that likely pose a threat to typical daily living. Finally, physical and social environmental factors are described by Moss and Schaefer to indicate physical features of the surrounding conditions as well as relationships between patients and providers, patients and their families, social support as well as expectations from friends, and clergy. As the model suggests, all of these factors together contribute to an individual's cognitive appraisal of an illness related stressor and impact coping behaviors, and consequently impact health outcomes. A visual representation of the model is presented in Figure 1.

Collectively, the notions derived from this theory suggest that demographic factors, which typically characterize marginalized groups such as lower socioeconomic status, race, age, and gender impact health outcomes, which can also be supported by data (Bell and Lee, 2011; Smedley et al., 2003; Williams et al., 2010). It is known that many minorities in our society experience additional stressors related to systematic oppression, microaggressions, as well as other disadvantages which make daily living more challenging when compared to white Americans (Sue et al., 2007). In addition to this, minorities have also been found to have poorer health and poorer health recovery (Bell and Lee, 2011; Smedley et al., 2003; Williams et al., 2010). For example, minorities likely experience more stress and have more difficulty gaining access to health care and preventative care. These additional stressors increase the likelihood of developing health conditions and also contribute to poorer prognosis and recovery (Williams, Priest, & Anderson, 2016). Braveman (2005) have also illustrated how multidimensional factors related to SES including access to resources, power and prestige can influence health in a number of different ways. These notions reflect the data presented which indicates minority populations experience more pain that whites. Further, this information offers insight into explanation and understanding regarding minority pain prevalence and outcomes.

Clark et al. (1999) presented a biopsychosocial model of racism as a stressor for African Americans. This model presents the notion that perception of racism along with other aspects of the biopsychosocial model play a significant role in stress and coping responses and thus work together to impact health outcomes. In addition to perception of racism, the model discusses

constitutional factors such as genetic family history and skin color to impact coping and health outcomes along with sociodemographic, psychological, and behavioral factors. An illustration of the model is presented in Figure 2.

Since its publication, this model has been used to conceptualize other ethnic minority groups worldwide including Asian Americans, Hispanic/Latinx Americans, American Indians and marginalized groups in England and Germany (Simons et al., 2108; Li, 2018; Ward, 2017). Overall, this theory reflects many aspects of Moos and Schaefer's model with the addition of perception of racism. Considering this in addition to Carlisle's (2014) work regarding discrimination and pain, it suggests that perception of racism plays a key role in chronic pain outcomes in minority populations. This data offers support which suggests that the perception of racism may also play a role in the racial and ethnic pain disparities. Further, given that the present study strives to assess PC as a factor which explains the relationship between being a minority and pain outcomes, perception of racism is a significant variable of consideration. Culture may also explain the associations between minority groups and pain, as well as the links between minorities and PC. As Peacock and Patel (2008) suggest, the relationship between pain and ethnicity is shaped by experience, learning and culture. This work also highlights the importance of considering culture and ethnicity in furthering pain research. The aim of this study is to pursue this direction by first establishing a connection with the variables of interest.

Taken together, in considering Moos and Schaefer's model along with Clark's model, it can be inferred that individuals who self-identify as a minority are likely going to experience

health outcomes shaped by cognitive appraisal, coping, and responses to physical illness influenced by their environment, demographics, and other personal factors. Although we do not have strong data regarding PC in minority groups, these models suggest that race and ethnicity work in conjunction to impact the development of cognitive appraisals, such as PC.

Conclusion

All in all, the noted research literature illustrates variables related to pain outcomes. These variables include demographics, coping style, anxiety, depression, and social support. The literature discussed also illustrates a relationship between PC and pain outcomes in addition to links between race, ethnicity, and culture to pain and PC. Although research data regarding PC in individuals who identify as a minority is limited, the theories discussed offer support to suggest the presence of disparities in PC and the significance of PC in pain outcomes. Given this information, the present study hypothesizes that self-identified Black and Hispanic/Latinx minorities will report more undesirable pain outcomes when compared to their white counterparts, and PC will uniquely explain this association above and beyond other factors including demographics, coping, anxiety, depression, and social support. In addition, this study also hypothesizes that perception of racism will be related to pain outcomes.

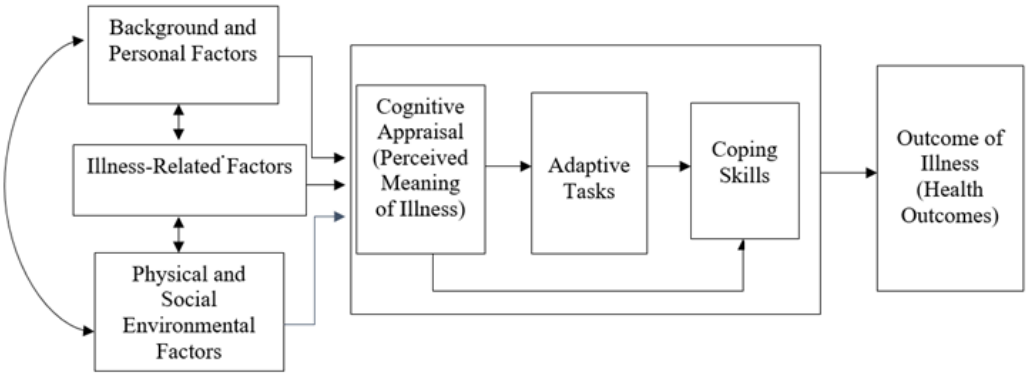

Figure 1. A Conceptual Model for Understanding the Crisis of Physical Illness.

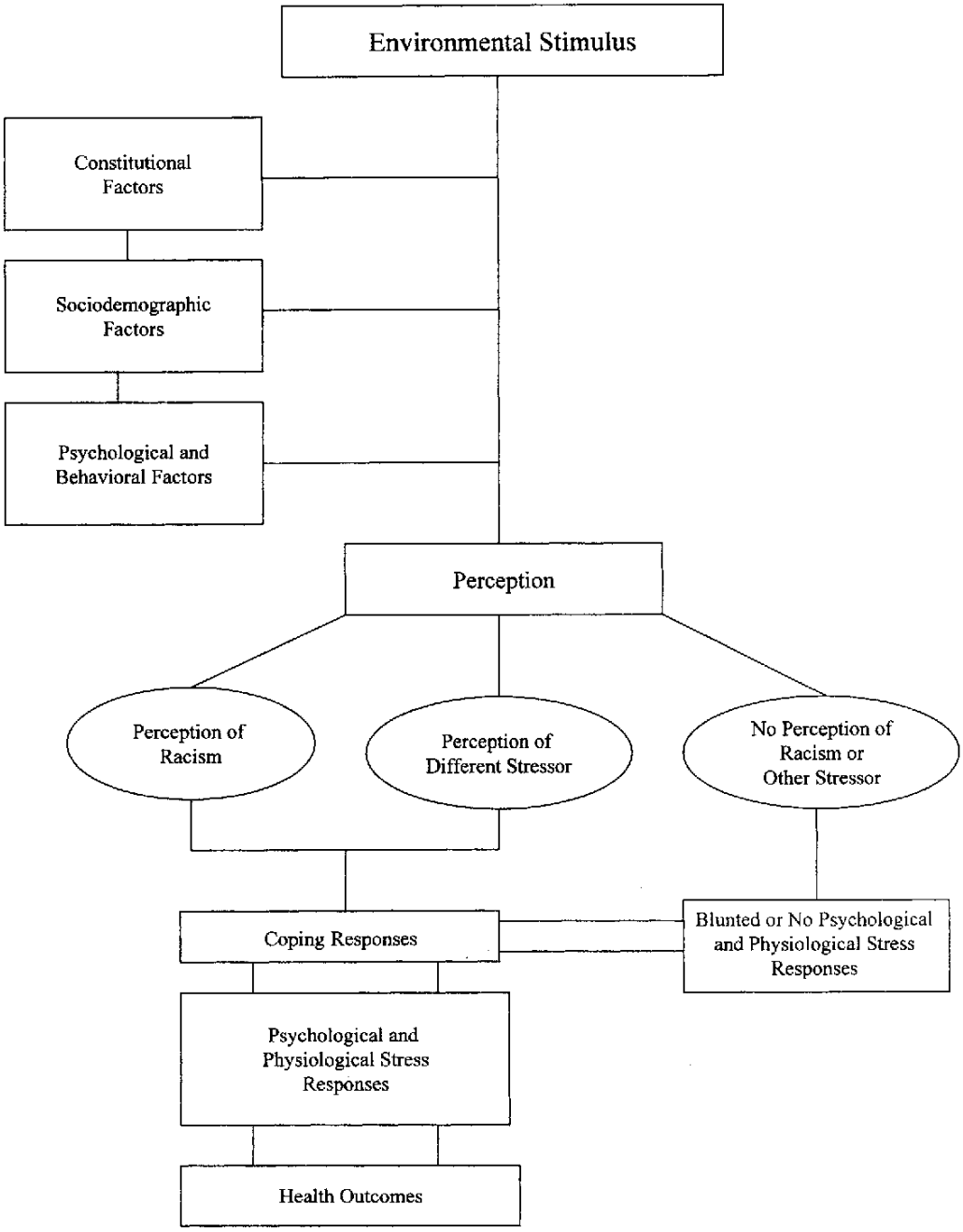

Figure 2. A Contextual Model to Examine the Biopsychosocial Effects of Perceived Racism.

CHAPTER 3

METHODOLOGY

This chapter discusses the research design and methodology for the study including the research questions and hypotheses, participants, instrumentation, procedures, and data analysis information.

Hypotheses

Hypothesis 1. Participants who self-identify as a racial/ethnic minority (e.g. Black and Hispanic/Latinx) will report greater pain severity, disability, frequency, and poorer life quality.

Hypothesis 2. Participants who self-identify as a racial/ethnic minority will report more pain catastrophizing.

Hypothesis 3. Pain catastrophizing in participants who self-identify as a racial/ethnic minority will predict pain outcomes above and beyond depression, anxiety, age, gender, SES, social support and other coping.

Exploratory Hypothesis. Minority participants who score higher on perceived racism will report more undesirable pain outcomes and more pain catastrophizing.

Research Design

This study reflects a cross-sectional research design as it involved gathering data from members of the community using a Qualtrics survey. This study proposed self-identified minority status as the independent or predictor variable with 2 levels that reflect self-identified

race and ethnicity. These levels include participants who identify as Non-Hispanic/Latinx, Euro-American/White and participants who identify as Hispanic/Latinx and/or other minority races. There are 4 continuous dependent, or outcome, variables which include pain intensity, pain disability, pain frequency, and life quality. The study hypothesized PC as a variable which can explain the relationship between self-identifying as a Black and/or Hispanic/Latinx minority and pain outcomes. Factors such as anxiety, depression, social support, gender, age and SES have been found to also be related to pain outcomes, however, the goal of this study was to assess the impact of pain outcomes experienced by self-identified minorities and the role of PC in these relationships. As such, the study statistically controlled for anxiety, depression, coping, social support, age, gender and SES by classifying these variables as covariates. The study applied the Analysis of Variance (ANOVA), Multivariate Analysis of Variance (MANOVA), and Multivariate Analysis of Covariance (MANCOVA), which will be detailed further later in this chapter.

Participants

The study required at least 80 participants. Dattalo (2008) present guidance on conducting a power analysis for MANCOVA using G Power, a downloadable statistical software program that calculates a-priori sample size. A power analysis applying these guidelines was conducted which produced a needed sample size of 80 participants ($f^2 = 0.15$, $\alpha = 0.05$, $1\text{-}\beta = 0.8$). The effect size was chosen based on work by Dattalo (2008) and Cohen (1988) who both note $f^2 = 0.15$ as a moderate effect size for multivariate analyses.

Recruitment of participants focused on clinics in Athens, GA and patients/clients at Live Forward/Aids Athens and Mercy Health Center. Inclusion criteria required that participants be at least 18 years of age and experience any type of chronic pain defined as pain experienced for 3 months or longer. Recruitment advertising involed flyers in exam rooms and waiting areas at each clinic as well as through providers at each clinic.

Procedure

The majority of participants were recruited through support from providers in the clinic. Information on the study (including flyers) were given to providers and they were invited to share study information with patients who met inclusion criteria. Incentive in the form of a Wal-Mart gift card valued at $15 was also offered. If a participant in the clinic was interested in participating, they were offered an ipad/tablet to complete the Qualtrics survey. Some participants who identified discomfort with technology were offered a paper and pencil format and their data was entered electronically by the researcher. Some participants were recruited through response to flyers and contacted the researcher by phone/text via Google Voice or by email. Inclusion criteria was confirmed and these participants were emailed the survey link for completion. Those who participated remotely were provided with an e-gift card or mailed the Wal-Mart gift card and information for sending compensation was collected prior to disseminating the survey link.

Participants were assigned a participant code number by the researcher and this number was entered on the survey. The Qualtrics survey began with an informed consent page followed

by a page prompting each participant to enter their participant number. Collection of demographic information was presented on a separate page followed by survey measures.

Measures

Demographic Survey. Demographic factors including age, gender, citizenship, marital status, as well as SES (education, and household income) was gathered from each participant. Self-identified minority status was classified based on each participant's report and description of their race and ethnicity. Participants were given the option to select from the following options: Black, African American, Black American, Caribbean Black, Hispanic, Latino/Latina/Latinx, Chicano/Chicana/Chicanx, American Indian or Alaskan Native, Asian/Asian American, Native Hawaiian or Other Pacific Islander, Biracial, Euro-American and/or White. Regarding ethnicity, participants were asked to select which best describes their ethnicity: Hispanic/Latino/Latina/Latinx, or Not Hispanic/Latinx. Participants also had the option to describe their race and ethnicity with an open-ended response. For data analysis, participants were grouped by their self-identified race and ethnicity to support homogeneity of groups assessed.

Pain Catastrophizing Scale (PCS, Sullivan, Bishop, & Pivik, 1995). The PCS is one of the most widely used measures of pain catastrophizing (Craner et al., 2016). The PCS is viewed to have adequate validity and high internal consistency with a noted Cronbach alpha of 0.95 (Sullivan, Stanish, Waite, & Sullivan, 1998; Osman et al., 2000). This measure consists of 13 items. Participants were asked to indicate the degree to which they have the specified thoughts

and feelings when they are experiencing pain. Examples of the items on this measure include: "It's terrible and I think it's never going to get any better" and "It's awful and I feel that it overwhelms me." Items are rated using a Likert Scale with 4 response options ranging from 0 = "Not all the time" to 4 = "All the time." Scores on the PCS can range from 0-52 with higher scores indicating more catastrophizing. The PCS can be interpreted using a total score in addition to 3 subscale scores for Rumination, Magnification, and Helplessness. For the purposes of this study, total pain catastrophizing was analyzed on 2 levels, moderate and high. Sullivan (2009) indicates scores in the range of 20-30 as moderate risk for pain chronicity and disability, and score at or above 30 as high risk. Given the goals of this study in assessing pain outcomes, these guidelines with be used for assessing pain catastrophizing.

Pain-Coping Inventory (PCI, Kraaimaat & Evers, 1997). The PCI is a 34-item measure of pain coping where items are rated on a Likert Scale with options ranging from 1 = "hardly ever" and 4 = "very often." The scales measures pain coping with regard to 2 dimensions of coping including active and passive coping while still assessing factors of coping individually via scales including pain transformation, distraction, reducing demands, retreating, worrying, and resting. Some may argue that the worrying scale reflects catastrophizing however, Kraaimaat and Evers (2003) make the argument for differences in these measures. Moreover, psychometrics provide support for good reliability ($\alpha = 0.92$) and validity of the PCI (Kraaimaat et al., 1997; Kraaimaat et al., 2003).

The Pain Disability Index (PDI, Tait, Chibnall, & Krause, 1990). The PDI is a reliable ($\alpha = 0.86$) and valid measure of pain disability. It assess the extent to which an individual's pain is impairing their ability to function in daily living. There are 7 items which assess areas including family/home responsibilities, recreation, social activity, occupational duties, sexual behavior, self-care, and life-support activity. Pain interference in each of the noted areas are rated on a scale from 0 (no disability) to 10 (total disability). Scores range from 0- 10 with a higher score representing more pain disability. The PDI also provides classifications for mild, moderate, and severe disability (Tait, Chibnall, & Krause, 1990).

Pain Severity (Domenica et. al, 2018). Pain severity was assessed using a digital visual analog scale with 4 item used to assess chronic pain at its best and worst in the last 24 hours in addition to average chronic pain and current level of pain on a scale from 1 (no pain) - 10 (pain as bad as you can imagine). Use of the analog scale for measuring pain severity has been noted in the literature to be a reliable ($\alpha = 0.9$) and validity measure (Domenica et. al, 2018).

Pain Frequency. Pain frequency was assessed by prompting participants to indicate how many pain days they have experienced in the past 30 days.

World Health Organization Quality of Life-Brief Version (WHOQOL-BRF, WHOQOL, 1996). The WHOQOL-BRF was used to measure life quality. The WHOQOL-BREF is a 26-item measure which assess QOL perceived by the individual completing the measure. A strength of this measure is that it was established by the WHO in an attempt to measure QOL across cultures (WHOQOL Group, 1998). It has domains measuring physical health,

psychological health, social relationships and environment in addition to overall QOL and general health. Items are rated on a 5-point Likert scale and a higher score indicates better QOL. The WHOQOL-BRF domain scores show good discriminant validity with regard to domains and good content validity, internal consistency and test–retest reliability. Cronbach's alpha at 0.87 provides support for its reliability (Skevington et al., 2004).

Perceived Ethnic Discrimination Questionnaire Community Version-Brief (PEDQ-CV-B, Brondolo, 2005). The PEDQ-CV-B was used to measure perception of racism. This measure consists of 17 items and assesses perceived racial or ethnic discrimination in community member of any ethnic group. Four factors are assessed including exclusion/rejection, stigmatization/disvaluation, discrimination at work/school, and threat/aggression. This measure was assessed for reliability and validity in different groups which compared reliability and validity across race and ethnicity, and with groups including community and student. Cronbach alphas ranged from 0.65 to 0.88. Moreover, the researchers of this work present the PEDQ-CV-B as a reliable and valid measurement of perception of racism (Brondolo et al., 2005).

Beck Depression Inventory (BDI-II, Beck, Steer & Brown, 1996). The BDI-II is a 21-item measure of depression. Participants were asked to rate symptoms of depression on a 4 point scale ranging from no worry regarding the symptom to marked impairment in functioning based on each symptom. The BDI-II has established internal consistency ($\alpha = 0.91$) and good validity (Wang, 2013; Beck, Steer & Brown, 1996). Scores on this measure can be classified as mild, moderate, and severe depression where higher scores indicate depression.

Beck Anxiety Inventory (BAI, Steer & Beck, 1997). The BAI is a 21-item measure of anxiety symptoms. Participants were asked to rate how bothered they have been by each symptom in the past month and respond by rating items on a 4-point scale ranging from "not at all" to "severely." Beck et al. (1988) provide data to support the validity and internal consistency ($\alpha = 0.92$) of this measure. Scores on this measure can be classified as low anxiety, moderate anxiety, and potentially concerning levels anxiety where higher score indicate more anxiety.

The Duke–UNC Functional Social Support Questionnaire (FSSQ, Broadhead, Gehlbach, DeGruy & Kaplan, 1988). The FSSQ was used to assess the strength of each participant's social support network. It is an 8-item measure with established reliability (Cronbach's alpha ranging from 0.80-0.93) and validity (Broadhead, Gehlbach, DeGruy & Kaplan, 1988). The FSSQ measures an individual's perception of the amount and type of personal social support they have on a 5-point scale ranging from 1 (much less than I would like) to 5 (as much as I would like). Higher scores indicate greater perceived social support.

Statistical Analyses

Preliminary Analyses. Prior to running statistical analyses, the study used the checklist for screening data and apply steps proposed by Tabachnick and Fidell (2018). This includes inspecting univariate descriptive statistics for accuracy of input, addressing missing data, checking for nonlinearity and heteroscedasticity, addressing nonnormal variables and outliers, and evaluating variables for multicollinearity and singularity. Similarly, their work also emphasizes the importance of evaluating assumptions when running a MANCOVA. As such,

these assumptions were evaluated applying the steps described by Tabachnick and Fidell (2018) for a MANCOVA.

In addition, although there is evidence to support a distinction between the PCS and the worrying subscale on the PCI. These measures were correlated to confirm a distinction between the 2 variables and steps were taken to address relationship between these variables.

Main Analyses. The plan for main analysis of each research question is listed below.

Research Question 1. Do participants who self-identify as a racial/ethnic minority (e.g. Black, Hispanic/Latinx) experience greater pain severity, disability, frequency, and poorer life quality?

Hypothesis 1. Participants who self-identify as a racial/ethnic minority (e.g. Black, Hispanic/Latinx) will experience greater pain severity, disability, frequency, and poorer life quality.

Hypothesis 1 Rationale. Minority disparities in pain have been noted in both laboratory and clinical studies of pain outcomes. In particular, Black and Hispanic/Latinx -Americans were found to experience more pain when compared to other racial/ethnic groups (Watson, 2005; Hsieh, 2010).

Analysis Plan. A one-way MANOVA was used to answer this research question. The independent variable was Race/Ethnicity which had 2 levels, classified by how participants report their racial/ethnic identity. There were 4 continuous dependent variables, pain frequency, life quality, pain severity, and pain disability.

Research Question 2. Do participants who self-identify as a racial/ethnic minority (e.g. Black, Hispanic/Latinx) report more pain catastrophizing?

Hypothesis 2. Participants who self-identify as a racial or ethnic minority will report more pain catastrophizing.

Hypothesis 2 Rationale. Although minimal, there is some data which indicates that minorities engage in more pain catastrophizing (George et al. 2008).

Analysis Plan. An Independent Samples T-Test was used to compare the means of pain catastrophizing in participants by their self-identified race and ethnicity. The independent variable is Race/Ethnicity and the dependent variable is pain catastrophizing assessed by the PCS.

Research Question 3. Does pain catastrophizing, in participants who identify as a racial/ethnic minority, predict pain outcomes above and beyond depression, anxiety, age, gender, SES, social support and other pain coping?

Hypothesis 3. Pain catastrophizing in participants who self-identify as a racial/ethnic minority will predict pain outcomes above and beyond depression, anxiety, age, gender, SES, social support and other coping.

Hypothesis 3 Rationale. In racial/ethnic minority participants, pain catastrophizing is related to more undesirable pain outcomes with regard to severity, disability, quality of life and frequency (Sullivan et al., 2001).

Analysis Plan. A one-way MANCOVA was used to test this hypothesis using the participants who identify as a racial/ethnic minority. The independent variable is pain catastrophizing which had 2 levels, moderate and high risk. There were 4 continuous dependent variables examining pain outcomes including pain frequency, severity, disability and life quality. There were also 7 continuous covariates including depression, anxiety, perceived social support, active and passive pain coping, gender, age, and SES.

Exploratory Question. Is perceived racism in minority participants related to pain outcomes and/or pain catastrophizing?

Exploratory Hypothesis. Minority participants who score higher on perceived racism will report more undesirable pain outcomes and more pain catastrophizing.

Exploratory Hypothesis Rationale. Moos and Shafer (1988) and Clarke et al. (1999) present different, but similar theories on a variety of factors including personal, biological, environmental and psychological factors which are suggested to work together to impact stress and coping appraisal and thus, health outcomes. Further, Clarke et al. (1999) also emphasizes the significance perception of racism also has on appraisal, coping and ultimately health outcomes. Carlisle (2014) also demonstrated a link between discrimination and chronic pain in Hispanic/Latinx participants.

Analysis Plan. A series of correlation analyses were run to explore the potential relationship between perception of racism and pain frequency, severity, disability, life quality and pain catastrophizing. All variables were continuous.

CHAPTER 4

RESULTS

Data Screening

A total of 87 respondent submissions were recorded in Qualtrics. These cases were examined in SPSS for accuracy, plausibility of values, and frequency and patterns of missing data (SPSS IBM Corp, 2016). Plausibility was assessed utilizing SPSS descriptives including the assessment of minimum values, maximum values, means, and standard deviations. No cases were eliminated for questions of plausibility. The distributions of variables were also examined for skewness and kurtosis. Two variables, income and the threat subscale of perceived ethnic discrimination, were slightly out of the normal range and these variables were transformed. All variables appeared to be normal or normal-like and no cases were perceived to be outliers. Missing data was also converted using the "system missing" function in SPSS. Further, inclusion criteria were evaluated to verify that all cases analyzed were responses provided by individuals who struggled with chronic pain. No cases were eliminated based on these criteria.

Sample Characteristics

Race and Ethnicity. All 87 respondents self-reported their race and ethnicity. Fifty-two participants (62.6 %) identified Euro-American or White as their race, 26 (31.3%) identified their race as Black or Black American, 14 identified their race as African American (16.8), and 2 (2.41%) identified as Hispanic. Participants were informed that they may select more than one response to identify their race and ethnicity. Ten participants identified multiple responses as

follows: 7 (8%) identified as both Black/Black American and African-American, 1 (1.2%) identified as both White and Native American, 1 (1.2%) identified as White, Hispanic and Asian American, and 1 (1.2%) identified as both Black American and Caribbean Black. Participants were also provided with space to describe their race and ethnicity further using free text and 27 (31%) participants utilized this space and provided details that generally reflected their selection of race. Regarding ethnicity, 1 (1.2 %) participant identified as Hispanic/Latino/Latina/Latinx and 83 (98.8%) identified as Not Hispanic/Latino/Latina/Latinx. Table 1 details the frequency of responses by race and ethnicity.

Table 1

Frequency of Responses by Race and Ethnicity, N = 83

Race		Frequency	Percent
	Euro American or White	52	62.6
	Black or Black American	26	31.3
	African American	14	16.8
	Caribbean Black	1	1.2
	Asian or Asian American	1	1.2
	Native American or Alaskan Native	1	1.2
	Hawaiian Native or Other Pacific Islander	0	0
	Biracial	0	0
	Latino/Latina/Latinx	0	0
	Chicano/Chicana/Chicanx	0	0
	Hispanic	2	2.41
Ethnicity			
	Hispanic/Latino/Latina/Latinx	1	1.2
	Not Hispanic/Latino/Latina/Latinx	82	98.8

Note. Participants were invited to select all responses which describe their racial and ethnic identity.

Race and Ethnicity for Data Analysis. For the purpose of data analysis (to support homogeneity of racial groups analyzed) the following three participants were eliminated from data analysis: participant who identified as both Native American and White, participant who identified as White, Hispanic and Asian American, and the participant who identified as Hispanic. The eight participants who identified some combination of Black, African-American, or Caribbean Black were grouped together with a total of 33 participants self-identifying their race and ethnicity as Black or African-American. Participants who self-identified as White or Euro-American were grouped together for a total of 50 participants.

After conducting initial data screening and accounting for homogeneity of racial identity groups, 83 of the 87 cases (95.4% of the original 87 submissions) remained for data analysis.

Sociodemographic Variables. Of the 83 participants who remained for data analysis, a total of 69 participants were recruited from Mercy Health Center (79.3%) and 14 (16.1%) participants were recruited from Live Forward (AIDS Athens).

The average age of participants was 49.33 years (range = 20 – 64) years. Regarding gender, 46 participants (55.4%) identified as female, 30 (36.1%) identified as male, and 2 (2.4%) identified as Agender. Forty (48.2%) participants self-identified their sex as female, 29 (34.9%) as male, and 1 participant (1.2%) identified as female at birth. The majority of participants identified their sexual orientation as heterosexual (59.1%, *n* = 49), 5 (6.1%) as Gay, 2 (2.4%) as Bisexual, and 3 (3.6%) as Pansexual. Relationship status was reported as follows; significant

other (8.4%, *n* = 7), single (38.5%, *n* = 32), married (21.7%, *n* = 18), divorced (19.3%, *n* = 16), and widowed (12%, *n* = 10). Regarding highest level of education, the majority of participants had completed some high school but had not earned a high-school diploma (29.9 %, *n* = 26), 21.8% (*n* = 19) earned a GED or high school diploma, 21.8% (*n* = 19) also completed some college, 9.2% (*n* = 8) completed a vocational program/certification, 5.7% (*n* = 5) earned a bachelor's degree, and another 5.7% (*n* = 5) had earned a graduate degree. In terms of annual income, the vast majority of participants (73.5%, *n* = 61) earned less than $15,000 per year, 9.6% (*n* = 8) earned between $15-20,000, 8.4% (*n* = 7) $20-25,000, 2.4% (*n* = 2) between $25-30,000, 1.2% (*n* = 1) between $30-35,000, 1.2% (*n* = 1) between $35-40,000, and 3.6% (*n* = 3) above $40,000. Data was not specifically collected on source of income. The majority of participants also self-reported as citizens of the United States (97.6%, *n* = 81). 2 participants (2.4%) selected "other" for citizenship. Table 2 shows the frequency and percentage of participant sociodemographic characteristics.

Table 2

Sociodemographic Variables, N = 83

Age		Years	
	Mean Age	49.33	
	Age Range	20-64	
Gender		**Frequency**	**Percent**
	Female	46	55.4
	Male	30	36.1
	Agender	2	2.4

Sex			
	Female	40	48.2
	Male	29	34.9
	Assigned Female at birth	1	1.2
Sexual Orientation			
	Heterosexual	49	59.1
	Gay	5	6.1
	Bisexual	2	2.4
	Pansexual	3	3.6
Relationship Status			
	Significant Other	7	8.4
	Single	32	38.5
	Married	18	21.7
	Divorced	16	19.3
	Widowed	10	12.0
Education			
	Some high school, no diploma	26	29.9
	Diploma or GED	19	21.8
	Some college, no degree	19	21.8
	Vocational school/Certification	8	9.2
	Bachelors Degree	5	5.7
	Graduate Degree	5	5.7
Annual Household Income			
	Below $15,000	61	73.5
	$15,000-20,000	8	9.6
	$20,000-25,000	7	8.4
	$25,000-30,000	2	2.4
	$30,000-35,000	1	1.2
	$35,000-40,000	1	1.2
	Above $40,000	3	3.6
Country of Citizenship			
	United States	81	97.6
	Other	2	2.4

Chronic Pain Characteristics

Participants were prompted to report chronic pain areas using a diagram of the body where they were asked to highlight sections of the body where they experience chronic pain. From this diagram of the body, 61.4% (*n* = 51) indicated pain in the lower back, 59.1% (*n* = 49) with leg pain, 43.2% (*n* = 35) with pain in the shoulders/upper back, 34.9% (*n* = 29) noted pain in the chest/stomach region, 27.7% (*n* = 23) indicated foot/ankles pain , 26.5% (*n* = 22) reported pain in the hands, 22.8% (*n* = 19) reported knee pain, 20.4% (*n* = 17) with pelvic/hip pain, 20.4% (*n* = 17) also reported pain in the head or face, 10.3% (*n* = 9) pain in the arms, and 8.4% (*n* = 7) reported pain in the back of the head.

Next, participants were provided with a written list of types of chronic pain and asked to select all of the body locations where they experience chronic pain. When presented with a written list of options and encouraged to select all types of pain they experience, participants reported the following types of pain; back pain (60.2%, *n* = 50), leg/foot pain (50.6%, *n* = 42), shoulder pain (39.7%, *n* = 33), hand/finger pain (33.7%, *n* = 28), headache (24.1%, *n* = 20), pelvic/hip pain (6%, *n* = 5), abdominal pain (3.6%, *n* = 3), neck pain (2.4%, *n* = 2), arm pain (1.2%, *n* = 1), and nerve pain (1.2%, *n* = 1).

Regarding known etiology of chronic pain and associated medical conditions, the following data was obtained; arthritis (53.1%, *n* = 44), previous injury (28.7%, *n* = 25), fibromyalgia (6%, *n* = 5), lupus (3.6%, *n* = 3), other autoimmune disorder (3.6%, *n* = 3), fibroids/polycystic ovary syndrome (3.6%, *n* = 3), diabetes (2.4%, *n* = 2), previous surgery

(2.4%, *n* = 2), physical work (1.2%, *n* = 1), and hemophilia (1.2%, *n* = 1). Frequency of types of chronic pain and associated medical conditions are illustrated in Table 3.

Table 3

Chronic Pain Characteristics, N = 83

Pain Region (From Diagram)		Frequency	Percent
	Lower Back	51	61.4
	Legs	49	59.1
	Shoulders/Upper back	35	43.2
	Chest/Stomach	29	34.9
	Foot/Ankles	23	27.7
	Hands	22	26.5
	Knees	19	22.8
	Head or face	17	20.4
	Pelvic/Hip	17	20.4
	Arms	9	10.3
	Back of head	7	8.4
Type of Pain			
	Back	50	60.2
	Shoulder	33	39.7
	Headache	20	24.1
	Leg/Foot	42	50.6
	Hand/Fingers	28	33.7
	Arm	1	1.2
	Pelvic/Hip	5	6
	Nerve	1	1.2
	Neck	2	2.4
	Abdominal	3	3.6
Associated Medical Condition/ Etiology			
	Previous Surgery	2	2.4
	Previous Injury	25	28.7
	Physical Work	1	1.2
	Arthritis	44	53.1
	Hemophilia	1	1.2

	Fibromyalgia	5	6
	Lupus	3	3.6
	Other Autoimmune Disorder	3	3.6
	Diabetes	2	2.4
	Fibroids/Polycystic Ovary Syndrome	3	3.6

Note. Participants were invited to select all that apply to them. Free text was also provided for *Type of Pain* and *Associated Medical Condition/Etiology*.

Chronic Pain Outcomes

On average, participants experienced pain 26 days (*SD* = 2.49) over the past 30 days, with a range of 1-30 days. This appears higher as compared to information cited from other clinical samples, for instance, Kjogz et al., (2012) indicated clinical sample of chronic pain individuals to average of 7.31 chronic pain days in a 30-day period. Pain severity averaged 5.7 (*SD* = 1.83) and ranged from 1-10. A pain severity score of 5.7 can be classified as moderate and studies typically cite pain severity in chronic pain patients to average about a 6 on a scale from 1 to 10 (Boonstra et al., 2016; Davis, 2018). This suggests that the pain severity reported is this study is about the same of those noted in other chronic pain studies. With regard to pain disability, participants averaged 44.85 (*SD* = 16.09) and scores ranged from 0-68. Scores on the PDI can range from 0 to 70. Participants' scores on this measure suggest a moderate to severe level of reported pain disability. Other studies site reported pain disability to average about 36 indicating that participants in this study are reporting slightly more pain disability than the average population (Beemster et al., 2018).

Participants scores on domains of quality of life are as follows; mean of physical health 10.4 (*SD* = 3.11, range 5-18), mean of psychological 12.24 (*SD* = 2.74, range 5-18), mean for social relationships was 12.47 (*SD* = 4.1, range 4-20), and mean for environment was 12.93 (*SD* = 2.85, range 5-18). Overall, these scores appear significantly lower as compared to other samples assessing quality of life in patients with chronic pain suggesting a overall poorer quality of life in this sample (Skevington & McCrate, 2012). Table 4 details values of quality of life as well as other pain outcomes for the present study as compared to clinical norms for other chronic pain patients.

In terms of pain catastrophizing, participants' score averaged 44.85 (*SD* = 13.5, range 0-65) on the Pain Catastrophizing Total Scale which falls in the 97th percentile. On the Rumination scale, participants scores averaged 14.78 (*SD* = 4.45, range 6-20), which falls in the 91st percentile, 8 for Magnification (*SD* = 3.52, range 3-15), 90th percentile, and 18.80 for Helplessness (*SD* = 6.65, range 6-30), 93rd percentile. According to Sullivan (2009), these average scores fall in the clinically significant range suggesting that overall, this sample of participants reported very high pain catastrophizing.

Table 4

Summary of Average Chronic Pain Outcome Scores, N = 83

Chronic Pain Outcomes		Mean	Range	Standard Deviation	Clinical Norm
	Frequency/Pain Days *(Past 30 days)*	26	0-30	2.49	7.31

	Severity	5.7	1-10	1.83	6
	Disability	44.85	0-68	16.09	36
Quality of Life					
	Physical Health	10.4	5-18	3.11	20.86
	Psychological	12.24	5-18	2.74	18.68
	Social Relationships	12.47	4-20	4.1	23.64
	Environment	12.93	5-18	2.85	17.9
Pain Catastrophizing					
	Rumination	14.78	6-20	4.45	11
	Magnification	8	3-15	3.52	5
	Helplessness	18.80	6-30	6.65	13
	Total	44.85	0-65	13.5	30

Note. Clinical Norms are based on other samples of patients with chronic pain.

Preliminary Data Analyses

Preliminary data analyses revealed good internal consistency for all measures, listed as follows: Pain Disability Index (α= .881), Pain Severity (α= .852), Pain Catastrophizing (α= .950), Quality of Life (α= .872), Pain Coping (α= .879), Beck Depression Inventory (α= .933), Beck Anxiety Inventory (α= .914), Social Support (α= .932), and Perceived Ethnic Discrimination (α= .920). With regard to other data screening and assumptions, assessments of results indicated normality, no univariate or multivariate outliers, independence of observations, homogeneity of variance, and no multicollinearity. Overall, results indicated that assumptions were satisfied to warrant the conduct of planned parametric statistics (Tabachnick & Fidell, 2018; Laerd Statistics, 2015). Further details on assessment of assumptions and results for each hypothesis are provided below.

Results

Hypothesis 1. Participants who self-identify as a racial or ethnic minority will experience greater pain severity, frequency, disability and poorer life quality.

A one-way multivariate analysis of variance (MANOVA) was run to determine the effect of race on pain outcomes. Four measures of pain outcomes were assessed: Pain Frequency, Pain Severity, Pain Disability, and Quality of Life. Race was categorized in two groups based on self-reported race and ethnicity, Non-Hispanic, Euro-American/White and Non-Hispanic, African-American/Black. Preliminary assumption checking revealed that data was normally distributed, as assessed by Shapiro-Wilk test ($p > .05$); there were no univariate or multivariate outliers, as assessed by boxplot and Mahalanobis distance ($p > .001$), respectively; there were linear relationships, as assessed by scatterplot; no multicollinearity ($r = .352$, $p = .003$); and there was homogeneity of variance-covariance matrices, as assessed by Box's M test ($p = .004$) (Laerd Statistics, 2015).

One-way MANOVA revealed a statistically significant difference in pain outcomes based on a self-identified race, F (8, 52) = 2.33, $p = .033$. No pairwise comparison, however, supported this hypothesis. Rather, one comparison found the opposite to be true. Specifically, racial minority participants reported greater psychological quality of life compared to participants who identified as White or Euro-American, F (1, 59) = 6.16; $p = .016$. Table 5 illustrates average pain outcome scores by self-identified race.

Table 5

Pain Outcomes by Race/Ethnicity, N = 83

Pain Outcome	Black American/African American		Euro-American/White	
	Mean	Standard Deviation	Mean	Standard Deviation
Frequency	26.77	2.63	26.52	2.72
Severity	6.19	1.94	5.82	1.82
Disability	44.96	19.43	44.62	13.70
QOL Physical Health	10.44	3.52	9.76	2.71
QOL Psychological	13.13	3.18	11.35	2.42
QOL Soc. Rel.	11.74	4.34	12.26	4.46
QOL Environment	13.07	3.09	12.41	2.86

Hypothesis 2. Participants who self-identify as a racial or ethnic minority will report greater pain catastrophizing.

An independent-samples t-test was run to determine if there were differences in pain catastrophizing between self-reported race. There were no outliers in the data, as assessed by inspection of a boxplot. Engagement scores for each level of race were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$), and there was homogeneity of variances, as assessed by Levene's test for equality of variances ($p = .165$) (Laerd Statistics, 2015).

Independent samples t-tests indicated that racial minority participants reported greater pain catastrophizing ($M = 46.35$, $SD = 13.7$) than other participants in general, $t(62) = 2.09$, $p = .04$. Table 6 depicts means for pain catastrophizing by self-identified race.

Table 6

Pain Catastrophizing by Race/Ethnicity, N = 83

	Black American/African American		Euro-American/White	
	Mean	Standard Deviation	Mean	Standard Deviation
Pain Catastrophizing Total	46.35	13.74	39.82	12.96
Magnification	9.65	3.84	8.23	3.22
Rumination	16.13	4.43	13.89	4.29
Helplessness	20.68	6.75	17.57	6.57

Hypothesis 3. Pain catastrophizing in minority participants will predict pain outcomes above-and-beyond depression, anxiety, age, gender, socioeconomic status, social support and other coping behaviors.

Multivariate Analysis of Covariance (MANCOVA). As planned, the Multivariate Analysis of Covariance (MANCOVA) was used to assess whether pain catastrophizing, as an independent variable, had an impact on the 4 dependent variables (pain frequency, severity, disability, and quality of life) when controlling for other factors known to impact pain, or covariates. These covariates included depression, anxiety, age, income, gender, social support and pain coping.

Regarding assumptions, there was a linear relationship between outcome variables, as assessed by visual inspection of a scatterplot. There was homogeneity of regression slopes, as assessed by the interaction terms for covariates. There was homogeneity of covariances, as assessed by Box's M test, $p > .001$. There were no univariate or multivariate outliers, as assessed

by no standardized residuals greater than ± 3 or Mahalanobis distance values greater than a specific cut-off point ($p > .001$), respectively. Residuals were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$) (Laerd Statistics, 2015).

The one-way MANCOVA showed that there was no statistically significant difference between pain catastrophizing groups on the combined dependent variables after controlling for covariates (depression, anxiety, age, income, gender, socioeconomic status, social support and pain coping), $F(1, 7) = 2.56$, $p = .448$.

Multiple Regressions. To further assess pain catastrophizing as a predictor on pain outcomes in the context of covariates, 4 separate multiple regressions were used to analyze pain catastrophizing as a predictor on pain frequency, pain severity, pain disability, and quality of life (QOL). Covariates included income, age, gender, depression, anxiety, social support, and coping. The overall models were non-significant for pain frequency ($p = .192$), pain disability ($p = .237$), QOL social relationships ($p = .520$), QOL physical health ($p = .505$), QOL psychological ($p = .171$), and QOL environment ($p = .463$). Results for pain severity are discussed below.

Pain Severity. A multiple regression was run to predict pain catastrophizing from gender, age, income, social support, depression, anxiety, and coping. With regard to assumptions, there was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.124. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized

predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. There were no studentized deleted residuals greater than ±3 standard deviations, no leverage values greater than 0.2, and values for Cook's distance above 1. The assumption of normality was met, as assessed by a Q-Q Plot (Laerd Statistics, 2015).

The multiple regression model significantly predicted pain catastrophizing on pain severity, $F(9, 20) = 2.54$, $p = .048$, adj. $R^2 = .282$. Pain catastrophizing was a significant predictor on pain severity, $b = .744$, $t(20) = 3.922$, $p = .006$ while other variables were non-significant predictors.

Exploratory Hypothesis. In patients who self-identify as racial/ethnic minority, perceived ethnic/racial discrimination will be related to pain outcomes (severity, frequency, disability, and quality of life) and pain catastrophizing.

Correlations. Bivariate correlations were assessed between levels of perceived ethnic and racial discrimination (exclusion, work, stigma, threat, and total discrimination) pain catastrophizing, and across chronic pain outcomes (frequency, disability, severity, and quality of life). Significant correlations were found between threat discrimination and the magnification scale of pain catastrophizing, r (30) = .430 $p = .014$ and between exclusion discrimination and pain disability, r (30) = .450, $p = .021$. A negative, low to moderate, negative correlation was found between threat discrimination and quality of life in social relationships, r (30) = -.453, $p = .009$. Negative low to moderate correlations were also found for quality of life in social

relationships and stigma related discrimination, r (30) = -.375, p = .034 as well as for total discrimination, r (30) = -.412, p = .019. All other correlations were non-significant. Table 7 illustrates data from each exploratory correlation.

Table 7

Exploratory Correlations by Perceived Discrimination, N = 32

	Threat	Exclusion	Work	Stigma	Total
Frequency	r = -.220 p = .227	r = .161 p = .380	r = -.068 p = .710	r = -.225 p = .216	r = -.098 p = .594
Severity	r = -.012 p = .946	r = .210 p = .249	r = .234 p = .197	r = .028 p = .887	r = .148 p = .419
Disability	r = .115 p = .575	r = .450 p = .021	r = .343 p = .086	r = .148 p = .471	r = .321 p = .138
QOL Physical Health	r = -.154 p = .339	r = -.321 p = .073	r = -.240 p = .186	r = -.158 p = .387	r = -.263 p = .146
QOL Psychological	r = -.174 p = .341	r = -.128 p = .487	r = -.129 p = .481	r = -.230 p = .206	r = -.196 p = .283
QOL Soc. Rel.	r = -.453 p = .009	r = -.335 p = .061	r = -.263 p = .145	r = -.375 p = .034	r = -.412 p = .019
QOL Environment	r = -.168 p = .357	r = -.159 p = .385	r = -.190 p = .298	r = -.162 p = .375	r = -.202 p = .268
PCS Rumination	r = .152 p = .405	r = -.220 p = .227	r = .079 p = .668	r = .193 p = .290	r = .162 p = .375
PCS Magnification	r = .430 p = .014	r = -.220 p = .227	r = .108 p = .557	r = .344 p = .054	r = .325 p = .070
PCS Helplessness	r = .304	r = -.220	r = .104	r = .325	r = .271

	$p = .096$	$p = .227$	$p = .557$	$p = .074$	$p = .141$
PCS Total	$r = .327$ $p = .073$	$r = .216$ $p = .242$	$r = .096$ $p = .608$	$r = .324$ $p = .075$	$r = .273$ $p = .138$

Hierarchical Multiple Regression. As noted above, pain catastrophizing was found to be a significant predictor of pain severity in participants who identified as a racial minority. With this in mind an exploratory analysis was conducted to assess perceived ethnic discrimination as an additional predictor on pain severity.

A hierarchical multiple regression was run to determine if the addition of pain catastrophizing and then of perceived discrimination improved the prediction on pain severity over and above age, income, gender, social support, depression, anxiety, and pain coping.

There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.15. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. There were no studentized deleted residuals greater than ±3 standard deviations, no leverage values greater than 0.2, and values for Cook's distance above 1. There assumption of normality was met, as assessed by Q-Q Plot.

The addition of pain catastrophizing to the prediction of pain severity (Model 2) led to a statistically significant increase in R^2 of .312, $F(1, 8) = 8.001$, $p = .022$. The addition of

perceived discrimination to the prediction of pain severity (Model 3) did not lead to a statistically significant change, $p = .234$.

Additional Exploratory Analyses

As previously noted, analyses focused on understanding predictors of pain outcomes specifically on racial minority participants. Additional exploratory analyses were conducted to explore pain catastrophizing and racial/ethnic discrimination as predictors for pain outcomes, for the sample as a whole. Multiple regressions were used to identify pain catastrophizing as a predictor on pain severity, pain frequency, pain disability, and quality of life.

Multiple Regression. A multiple regression was run to predict pain severity from pain catastrophizing, coping, income, social support, age, gender, depression and anxiety. After checking that assumptions were satisfied, the multiple regression model was found to statistically significantly predict pain severity, $F(8, 47) = 3.339$, $p = .004$, adj. $R^2 = .254$. Pain catastrophizing was found to be the sole predictor of pain severity, $b = .072$, $t(43) = 4.043$, $p = .000$.

A multiple regression was run to predict pain disability from pain catastrophizing, coping, income, social support, age, gender, depression and anxiety among the overall sample. After checking that assumptions were satisfied, the multiple regression model was found to statistically significantly predict pain diability, $F(8, 36) = 6.228$, $p = .000$, adj. $R^2 = .49$. Pain catastrophizing was found to be the sole predictor of pain disability, $b = .481$, $t(43) = 4.028$, $p = .000$.

The overall model was non-significant for pain catastrophizing as a predictor of pain frequency (p = .248) and quality of life (psychological, p = .079; social relationships, p = .238). Regarding quality of life in the physical health domain and the environment domain, the models were significant (physical health, $F(10, 43) = 9.28$, p = .000, adj. R^2 = .610 ; environment, $F(10, 43) = 3.319$, p = .003, adj. R^2 = .304), however, pain catastrophizing was not found to be a significant predictor of physical health (p = .113) and environment (p = .546).

Hierarchal Regression. To further explore the predictors of pain disability, a hierarchal regression was used to determine if the addition of pain catastrophizing (Model 2), race (Model 3), and then of perceived discrimination (Model 4) improved the prediction on pain disability. After confirming assumptions were satisfied, the hierarchal regression found that the addition of pain catastrophizing to the prediction of pain disability (Model 2) led to a statistically significant increase in R^2 of .540, $F(8, 35) = 5.137$, p = .000. Pain catastrophizing was found to be a significant predictor of pain disability, however, race (p = .965) and perceived ethnic discrimination (p = .903) were non-significant.

CHAPTER 5

DISCUSSION

Summary of the Study

Research has documented that racial and ethnic minorities tend to report increased chronic pain frequency and severity (Flaskerud, 2015; Fillingim et al., 2009). Further, the literature provides evidence to suggest that racial and ethnic minorities are reporting increased disability and poorer life quality due to chronic pain (Turk & Okifuji, 2002). In recent years, chronic pain has become an increasing burden on society as it accounts for a significant portion of health care costs, medical visits, and lies at the origin of the present opioid epidemic (Institute of Medicine, 2011). While the opioid epidemic was initially characterized by overuse of prescription medications for pain in White/Euro-Americans, more recent reports indicate that Black Americans are abusing opioids for pain at increasing rates (Harrison et al., 2018). Given both the relevance of chronic pain issues in our society as well as the racial and ethnic disparities in chronic pain, the purpose of this research project was to investigate racial and ethnic differences in chronic pain in order to bridge the gap in this disparity.

Evidence suggests that pain catastrophizing, maladaptive cognitions about pain, is a strong predictor of chronic pain outcomes (frequency, severity, disability, and life quality) where those who report increased pain catastrophizing, also report poor pain outcomes (Sullivan, 2001). Moreover, a few studies have also documented racial and ethnic disparities in pain catastrophizing (Leung, 2012). There are only a couple known studies which have investigated

the role of pain catastrophizing on pain in racial and ethnic minorities (Meints & Hirsh, 2015; Fabian, McGuire, Goodin, & Edwards, 2011). These studies assessed acute pain in minority participants and found pain catastrophizing to be a strong predictor of pain in the study participants. These results provide additional evidence to suggest the significance of pain catastrophizing in understanding chronic pain disparities and racial and ethnic minorities.

Clark et al. (1999) and Moos and Schaefer (1984) provide models for conceptualizing racial and ethnic chronic pain disparities. These models suggest that the chronic pain outcomes are experienced as a result of a combination of biopsychosocial factors. Of note, the Clark et al. (1999) model also illustrates the importance of perception of racism in understanding their health outcomes. Furthermore, health disparities researchers also highlight the importance of understanding an individual's racial identity and appraisals related to minority stress (Helms & Mereish, 2013; Meyer & Frost, 2013; Helms, 1990). One research study also provides evidence of a documented association between perception of racism and chronic pain outcomes (Carlisle, 2014). In considering the noted literature and theoretical models described, the present study aimed to explore pain cognitions as well as perceived racial and ethnic discrimination as it relates to chronic pain outcomes, while also controlling for other factors which have been known to be associated with chronic pain. Specifically, the following 4 hypotheses were generated:

> **Hypothesis 1**: Participants who self-identify as a racial/ethnic minority (e.g. Black, Hispanic/Latinx) will report greater pain severity, disability, frequency, and life quality.

Hypothesis 2: Participants who self-identify as a racial/ethnic minority (e.g. Black, Hispanic/Latinx) will report greater pain catastrophizing.

Hypothesis 3: Pain catastrophizing in participants who self-identify as a minority will predict pain outcomes above and beyond anxiety, depression, social support, coping, SES, age, and gender.

Exploratory Hypothesis: Perception of racism will be related to pain outcomes and pain catastrophizing.

These hypotheses were examined by assessing chronic pain patients at 2 community clinics in Athens, GA. Participants completed a Qualtrics Survey which consisted of measures to assess chronic pain frequency, severity, disability, life quality, as well as pain catastrophizing, racial and ethnic discrimination, and other factors thought to impact chronic pain. Each participant received a $15 Wal-Mart gift card in compensation. Results were analyzed using Independent Samples T-Test, Multivariate Analysis of Variance, Multivariate Analysis of Covariance and Regressions.

Study Findings

Results of this study did not support Hypothesis 1, that participants who self-report as a racial minority would report poorer pain outcomes. In assessing this hypothesis, it was found that racial minority participants actually reported better quality of life in the psychological domain (M = 13.13, SD = 3.2). The results found were not consistent with data documented in the literature. However, Hypothesis 2 was found to be significant. Consistent with the literature, it

was found that participants who self-identified as a racial minority did report greater pain catastrophizing (M = 46.35, SD = 13.7).

When MANCOVA was conducted, the reported experience of pain catastrophizing did not predict participants' experience of chronic pain when controlling for other factors suggested to precipitate chronic pain as noted in Hypothesis 3. Moreover, given that a MANCOVA assesses for effects in 2 or more dependent variables, multiple regression was used to assess for pain catastrophizing as a predictor for each dependent variable. Results were non-significant when assessing for pain catastrophizing as a predictor for pain frequency, disability, and life quality. However, multiple regression analysis (F(9, 35) = 3.354, p = .006, adj. R^2 = .282; b = .744, t(28) = 3.922, p = .000) revealed that pain catastrophizing was found to be a significant predictor on pain severity when assessed against other factors known to impact chronic pain (age, gender, income, social support, depression, and anxiety). This suggests that pain catastrophizing is playing a significant role in the predication of chronic pain severity in participants who identify as a racial minority. In an effort to further understand factors which impact chronic pain severity, a hierarchal regression was used to assess both the role of pain catastrophizing and perceived racial discrimination on pain severity. Results were non-significant, perceived racial discrimination did not significantly predict pain severity.

Finally, with regard to the Exploratory Hypothesis and perception of racial and ethnic discrimination, significant low to moderate correlations were found between threat discrimination and the magnification scale of pain catastrophizing (r (30) = .430 p = .014) as

well as between exclusion discrimination and pain disability (r (30) = .450, p = .021). A negative, low to moderate correlation was found between threat discrimination and quality of life in social relationships (r (30) = -.453, p = .009). Negative low to moderate correlations were also found for quality of life in social relationships and stigma related discrimination (r (30) = -.375, p = .034) as well as for total discrimination (r (30) = -.412, p = .019).

Characteristics of this sample might explain the outcomes of this study. The clinics in which participants were recruited are community clinics treating medically uninsured members of the Athens, GA community. Given the indigent nature of this patient population, results may be skewed as it is possible this population as a whole is experiencing poorer pain outcomes, despite race. Additionally, as a whole, this sample reported significantly high pain catastrophizing (M = 44.85, SD = 13.5) which suggests high risk for pain chronicity and pain disability. Similarly, exploratory analyses revealed that this sample as a whole reported greater pain disability (M = 44.85, SD = 16.09) and poorer quality of life (M = 10.4, 12.24, 12.47, 12.93, SD = 3.11, 2.74, 4.1, 2.85). Given the high scores of pain catastrophizing and poorer pain outcomes, it may also be possible that the sample population's skew towards poorer pain outcomes makes it difficult to identify racial differences in pain outcomes. In addition to this, questions around access to healthcare may also explain outcomes of this study. Recognizing that this study consisted of individuals who typically do not have a strong background in communicating with health providers might contribute to these differences.

Additionally, in conducting additional exploratory analyses, pain catastrophizing was found to be a significant predictor of pain disability across the sample as a whole ($F(8, 36) = 6.228$, $p = .000$, adj. $R^2 = .49$; $b = .481$, $t(43) = 4.028$, $p = .000$). This finding supports the literature around the predictive role of pain catastrophizing. It begs the question of whether these findings are more characteristic of the demographics (lower SES; medically uninsured) of the whole sample or whether a larger racial minority sample size may have produced similar results. Moreover, these considerations may also explain why pain catastrophizing was not found to be a predictor of pain frequency and quality of life when controlling for other pain factors.

Strengths of Study

One of the most telling strengths of this study is that it explored a relevant area of concern in a unique population. This population consisted of participants who were medically uninsured, of lower socioeconomic status and who struggled with chronic pain. Such a unique population is not easily accessible and the ability to explore the experiences of such a population provides confidence in the generalizability to other populations with similar demographics. As previously noted, this study examined information provided by chronic pain patients themselves as opposed to participants experiencing induced/acute pain. Given the significant differences in the experience of acute verses chronic pain, the design of this study provides results which are a more accurate representation of clinical patients who struggle with chronic pain.

Based on the literature reviewed, there are a limited number of studies which sought to explore factors including racial and ethnic minority differences in chronic pain and pain

catastrophizing. Moreover, as documented by researchers in health disparities as well as models for understanding biopsychosocial impacts on health outcomes, there needs to be significant emphasis on factors such as demographics, environment, psychological appraisals for coping in addition to appraisals and perceptions of racism (Helms & Mereish, 2013; Meyer & Frost, 2013; Clark et al., 1999; Moos & Shaefer, 1984). This study's design poses additional strengths to the study as it was designed with sensitivity to these and other potential factors which can impact chronic pain. This attention to a number of significant factors provides relevant yet unique contributions to the research literature in chronic pain disparities.

Limitations

There are some considerations that should be taken into account when reviewing this study. Although measures were in place to ensure results analyzed were valid, there are some concerns with regard to participants secondary gains and motives for completing the study. Some participants had questions about whether this would impact their current chronic pain treatment. Others appeared motivated to participate for compensation offered. Moreover, these points are worth considering in interpreting the results of the study.

In addition to this, it is possible that other factors including type of chronic pain, developmental and trauma history, substance use, and spirituality could have more of an impact on chronic pain outcomes. This study took a general approach to understanding chronic pain and did not discriminate based on location of chronic pain or medical conditions at the root of chronic pain. Moreover, assessment of cognitions around pain were primarily explored, however,

there may also be value in exploring cognitions related to specific medical concerns that are at the origin of chronic pain. It is possible that this information could be a determining factor which shapes experience of chronic pain frequency, severity, disability and life quality. Moreover, while this study did control for anxiety and depression, there was not a strong emphasis on constructs such as developmental history, trauma, and substance use. Further, use of medications to manage chronic pain was not assessed as a determining factor for chronic pain outcomes. These ideas offer points of consideration future research in chronic pain disparities might focus on.

Future Research

In addition to the factors noted in the previous section, future research in chronic pain disparities might benefit from attempting to answer the same research questions using a larger sample size. It may be possible that this sample size was too small for the statistical analyses used. Additionally, it is worth considering exploring how these results might differ in a chronic pain sample of individuals who are not of lower socioeconomic status and who hold medical insurance. It is possible that this study's results may be limited by the fact that the population assessed is a more indigent and disabled population, making it difficult to exclusively explore the role of chronic on cognitions, disability, and quality of life.

Future research in chronic pain disparities may also benefit from further exploration into chronic pain resilience in racial and ethnic minority individuals as well as a focus on internventions around pain cognitions. Such information might aid in understanding factors

which can support resilience and provide adaptive coping in dealing with chronic pain. As this study demonstrates, there is a presence of disparities in chronic pain related cognitions, it may also be helpful to conduct research and quality improvement studies on intervention for pain catastrophizing in racial and ethnic minority individuals. Such research can shed light on how to facilitate more adaptive cognitions around pain.

Moreover, future research may also benefit from exploring possible mediating variables that might impact perceived discrimination and chronic pain outcomes. Variable such as depression and anxiety may likely play a mediating role on perceived discrimination and how it impacts the experience of chronic pain.

Finally, this study did not assess factors prominent in the patient provider relationship. It is also likely that how a provider responds to a patient's reported pain might shape how the patient relates to the his/her pain. With this in mind, future research might benefit from aiming to explore the role of patient-provider relationships and perceived racial and ethnic discrimination on chronic pain outcomes.

Implications and Conclusion

Overall, the results of this study paint a picture of resilience in Black/African-American participants. While these participants did report more pain catastrophizing, it was not found to negatively impact their quality of life, nor their frequency of pain events or disability related to pain. It suggests that while these participants are reporting chronic pain outcomes similar to another race, they are reporting more satisfaction in their psychological quality of life. More

specifically, these participants reported more positive feelings, less negative feelings, greater self-esteem, and stronger spirituality. With regard to perceived racial and ethnic discrimination, negative correlations suggest that in participants who self-identify as a racial minority, social relationships (social support, personal relationships and sexual activity) may be a buffer for the effects of perceived discrimination, particularly for stigma and threat related discrimination. Taken together, these results provide some information related to resilience in participants who identified as a racial minority. Factors including social support and psychological health can be used in guiding treatment with Black/African-American chronic pain patients and in providing general mental health support to individuals of this demographic.

This study also illustrated the significance of pain catastrophizing in a number of ways. First, it is noteworthy that pain catastrophizing was significantly high for the sample as a whole, suggesting that participants are experiencing an abnormally high level of unhelpful cognitions about their chronic pain. Regarding the sample as a whole, cognitions were found to significantly predict pain disability. Moreover, in exploring pain catastrophizing in racial minority participants, maladaptive cognitions about pain was higher in racial minority participant. These cognitions were also found to significantly predict pain severity. Taken together, these results highlight the significance of this variable and speak to how useful it can be to focus treatment and intervention around cognitions about pain. Further, in considering Black/African-American individuals with chronic pain, addressing cognitions around pain may be useful in reducing pain severity and may also be helpful to address in the context of perceived discrimination.

In closing, this study explored significant factors related to chronic pain in a racially diverse and indigent sample. Generally speaking, participants in the sample reported more pain catastrophizing as well as more pain disability and poorer quality of life compared to chronic pain patients in other studies. Results indicate that attention should be given to supporting these patients in coping with chronic pain and disability. This study also provides evidence for effectiveness in addressing cognitions around pain to improve pain severity and disability.

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APPENDIX A

COPY OF QUALTRICS SURVEY

Chronic Pain

Start of Block: Informed Consent

Q108 Participant Identification Number

_____

Q109 **UNIVERSITY OF GEORGIA CONSENT FORM** The Role of Pain Catastrophizing in Racially Diverse Groups **Researcher's Statement** We are asking you to take part in a research study. Please ask the researcher if there is anything that is not clear or if you need more information. When all your questions have been answered, you can decide if you want to be in the study or not. A copy of this form will be given to you. **Principal Investigator**: Bernadette Heckman Counseling and Human Development Services bheckman@uga.edu **Purpose of the Study** The purpose of this study is to understand what pain is like for people who experience chronic pain. We want to understand the factors that contribute to chronic pain and related conditions, such as depression and anxiety. Your involvement in the study is voluntary, and you may choose not to participate or to stop at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision about whether or not to participate will have no bearing on the services you receive at the clinic. **Study Procedures** If you agree to participate, you will be asked to complete a 30-minute survey online that will ask you to: • Answer questions regarding your thoughts and feelings around your pain. • Answer questions related to how pain affects you. • Answer questions related to your emotions and feelings related to pain as well as other personal thoughts, feelings, and reactions. • Answer questions about your identity including your race, ethnicity, gender and sexual orientation. **Risks and discomforts** We do not foresee any significant risks associated with participating in this survey, however, we will be asking you some questions about sensitive information including your thoughts, feelings, emotions and demographics that might be discomforting for some to disclose. These questions may bring feelings of stress/discomfort, sadness, guilt, or anxiety which can be discomforting for some individuals. In particular, one of the questions asks about suicidal thoughts which can be difficult for some. If you do express thoughts of suicide, there may be some follow up steps taken to ensure your safety. If you do experience any discomfort, you may let the

research assistant or a staff member at your clinic know and additional resources will be provided. You may also speak to someone by utilizing the Georgia Access and Crisis Line by calling 1-800-715-4225 which is available 24 hours per day, 7 days per week. **Benefits** This study does not offer any direct benefit to you. However, your answers on the survey will help us understand what pain is like for you and others like you. We hope to use this information to inform our work in understanding and treating pain. **Incentives for participation** You will be provided with a $15 dollar gift card to Wal-Mart for participating in the study. **Privacy/Confidentiality** The data we collect will be linked indirectly to you with use of a participant code number that is stored separately from your answers on the survey. Your identity will be protected since the data will be stored separately from your identifying information. Only research assistants approved by the IRB at UGA will have access to the data and identifying information. If you disclose particular information, by law, it may need to be reported. If you indicate that you are a harm to yourself, another person, or, if you report abuse of a child or elderly person, these would need to be reported. Your responses will be checked within 24 hours of the survey being completed to assess for any need to report. If you disclose thoughts of wanting to die or thoughts of wanting to hurt yourself in some way, we will ask you some follow up questions and work with you to plan next steps to ensure your safety. Since the survey is online, note that your confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties. If you decide to stop or withdraw from the study, the information/data collected from or about you up to the point of your withdrawal will be kept as part of the study and may continue to be analyzed. **If you have questions** The main researcher conducting this study is Sarah Rupnaraine a graduate student at the University of Georgia. Please ask any questions you have now. If you have questions later, you may contact Bernadette Heckman at bheckman@uga.edu or at 706-542-1812. If you have any questions or concerns regarding your rights as a research participant in this study, you may contact the Institutional Review Board (IRB) Chairperson at 706.542.3199 or irb@uga.edu.

Q110 I have read, understood, and obtained a copy of the above consent form and desire of my own free will to participate in the study.

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If I have read, understood, and obtained a copy of the above consent form and desire of my own free... = No

End of Block: Informed Consent

Start of Block: Demographic Questions

Q96 What is your current age?

_____

Q97 Please indicate your gender.

_____

Q98 Please indicate your sex.

_____

Q99 Please select which of the following best describes how you identify your race and ethnicity. You may select more than one option.

- ☐ White/Caucasian (1)
- ☐ Black (2)
- ☐ African-American (3)
- ☐ Black American (4)
- ☐ Caribbean Black (5)
- ☐ Hispanic (6)
- ☐ Latino/Latina/Latinx (7)
- ☐ Chicano/Chicana/Chicanx (8)
- ☐ Asian or Asian American (9)
- ☐ Native American or Alaskan Native (10)
- ☐ Hawaiian Native or Other Pacific Islander (11)
- ☐ Biracial (12)
- ☐ Other (13) _____

Q100 Please use the space below to describe your race and ethnicity further.

_____

Q101 Please select which of the following describes you best.

- ○ Hispanic or Latino (1)
- ○ Not Hispanic or Latino (2)

Q102 Please indicate your country of citizenship.

- ○ United States of America (1)
- ○ Other (2) _____

Q104 Please describe your sexual orientation.

_____

Q103 What is your Martial Status?

- I am not married, but I have a significant other. (1)
- Single (2)
- Married (3)
- Divorced (4)
- Widowed (5)
- Other (6) _____

Q105 Please select which of the following best describe your highest level of education.

- I did not graduate high school or earn a GED (1)
- I earned my GED or high school diploma (2)
- I attended some college or vocational school but did not complete a program or earn a certificate (3)
- I completed a program or earned a certificate from a college or vocational school (4)
- I earned a Bachelors Degree (5)
- I have earned a Graduate Degree (6)
- Other (7) _____

Q106 Please select which of the following best describes your total Annual Household Income.

- ○ Below $15,000 per year (1)
- ○ $15,000 - $20,000 per year (2)
- ○ $20,000 - 25,000 per year (3)
- ○ $25,000-30,000 per year (4)
- ○ $ 30,000- 35,000 per year (5)
- ○ $35,000 - 40, 000 (6)
- ○ Above $40,000 per year (7)
- ○ Other (8) _____

Q107 How many people live in your household?

- 1 (4)
- 2 (5)
- 3 (6)
- 4 (7)
- 5 (8)
- 6 (9)
- 7 or more (10)

Q112 Please select which site you receive services from.

- Mercy Health Center (1)
- Live Forward (2)

End of Block: Demographic Questions

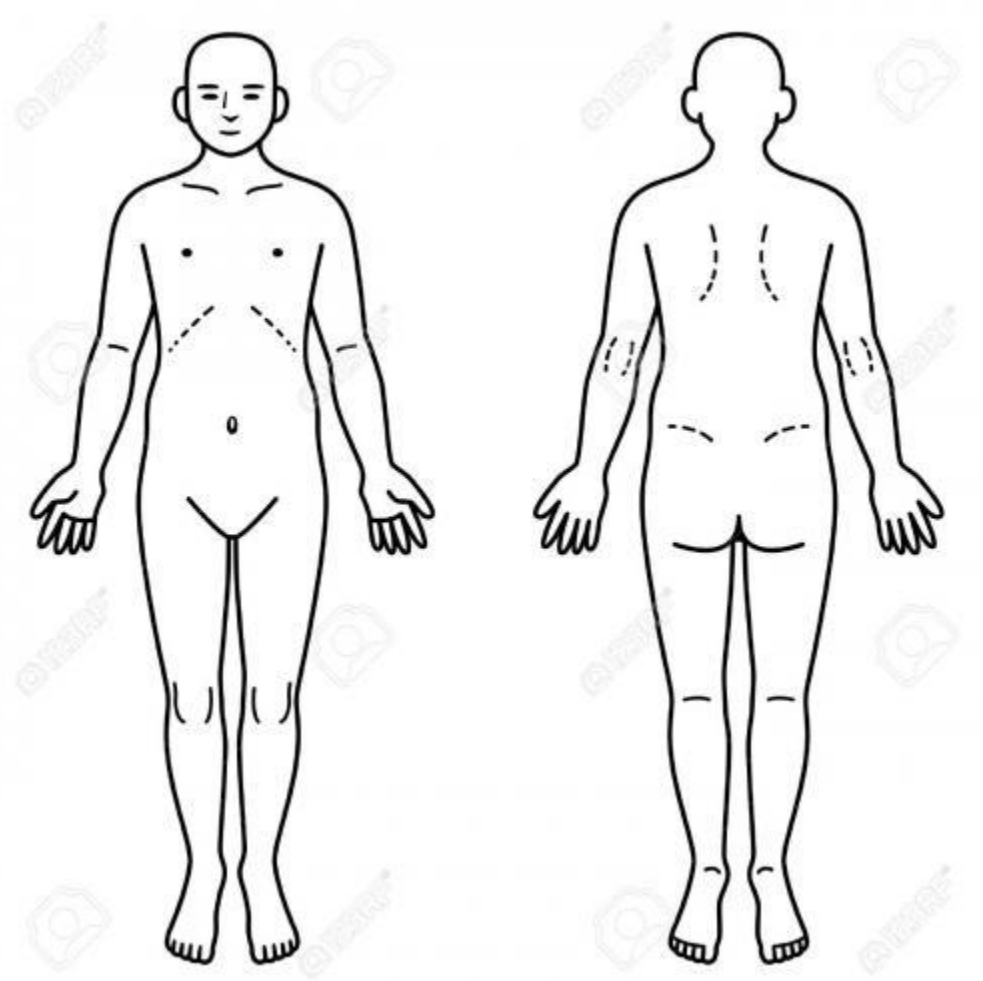
Start of Block: Brief Pain Inventory

Q65 Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?

- Yes (1)
- No (2)

Q68 On the diagram below, click on the areas where you hurt the most.

	Off (1)	On (2)
Head or Face (1)		
Back of Head (2)		
Chest or Stomach (3)		
Shoulders or Upper Back (4)		
Arms (5)		
Hands (6)		
Back and Lower Back (7)		
Legs (8)		
Pelvic/Hips (9)		
Foot and Ankles (10)		
Hands (11)		
Hands (12)		
Region #13 (13)		
Region #14 (14)		
Region #15 (15)		
Region #16 (16)		



Q111 Have one of more of these areas of pain been present for 3 months or longer?

- ○ Yes (1)
- ○ No (2)

Q92 In the past month (30 days), about how many days have you experienced pain from the areas noted above?

_____

Q113 What medical conditions is your pain associated with? PLEASE MARK ALL THAT APPLY TO YOU.

- ☐ Injury (10)
- ☐ Arthritis (1)
- ☐ Back Pain (2)
- ☐ Shoulder Pain (3)
- ☐ Leg Pain (4)
- ☐ Hand Pain (5)
- ☐ Headache (6)
- ☐ Lupus (7)
- ☐ Fibromyalgia (8)
- ☐ Other (9) _____

Q70 Please rate the following.

0 = No Pain

10 = Pain As Bad As You Can Imagine

	0	1	2	3	4	5	6	7	8	9	10
Your pain at its WORST in the last 24 hours. ()											
Your pain at its LEAST in the last 24 hours. ()											
Your pain on AVERAGE. ()											
Your pain RIGHT NOW. ()											

End of Block: Brief Pain Inventory

Start of Block: Brief Pain Inventory 2

Q72 What treatment or medication are you receiving for your pain?

_____

Q73 In the last 24 hours, how much relief have pain treatments or medication provided? Please select the number that best represents the percent that most shows how much RELIEF you have received.

- ○ 0 (0)
- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 (7)
- ○ 8 (8)
- ○ 9 (9)
- ○ 10 (10)

Q74 For the items below, select the number that describes how pain has interfered with the following areas in the past 24 hours.

Q75 General Activity

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Q76 Mood

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Q77 Walking Ability

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Q78 Normal Work

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Q79 Relations with other people

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Q80 Sleep

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Q81 Enjoyment of Life

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

End of Block: Brief Pain Inventory 2

Start of Block: Pain Catastrophizing

Q3 Everyone experiences painful situations at some point in their lives. Such experiences may include headaches,tooth pain, joint or muscle pain. People are often exposed to situations that may cause pain such as illness, injury or dental procedures or surgery.

We are interested in the types of thoughts and feelings that you have when you are in pain. Listed below are thirteen statements describing

different thoughts and feelings that may be associated with pain. Please select the degree to which you have each of these thoughts and feelings when you experience pain.

	Not at All (1)	To a Slight Degree (2)	To a Moderate Degree (3)	To a Great Degree (4)	All the Time (5)
When I am in pain I worry all the time about whether the pain will end. (1)	○	○	○	○	○
When I am in pain I feel I can't go on. (2)	○	○	○	○	○
When I am in pain, it is terrible and I think it's never going to get any better. (3)	○	○	○	○	○
When I am in pain it is awful and I feel that it overwhelms me. (4)	○	○	○	○	○
When I am in pain, I feel I can't stand it anymore. (5)	○	○	○	○	○
When I am in pain, I become afraid that the pain will get worse. (6)	○	○	○	○	○
When I am in pain, I keep thinking of other painful events. (7)	○	○	○	○	○
When I am in pain I anxiously want the pain to go away. (8)	○	○	○	○	○
When I am in pain I can't seem to keep it out of my mind. (9)	○	○	○	○	○
When I am in pain I keep thinking about how much it hurts. (10)	○	○	○	○	○
When I am in pain I keep thinking about how badly I want the pain to stop. (11)	○	○	○	○	○

When I am in pain there is nothing I can do to reduce the intensity of the pain. (12)	○	○	○	○	○
When I am in pain I wonder whether something serious may happen. (13)	○	○	○	○	○

End of Block: Pain Catastrophizing

Start of Block: Pain Disability Index

Q62 For each of the 7 categories listed, please select the number on the scale that describes the level of disability you typically experience. A score of 0 means No Disability At All and a score of 10 means Worst Disability.

Q63 0 = No Disability At All

10 = Worst Disability

0 1 2 3 4 5 6 7 8 9 10

FAMILY/HOME RESPONSIBILITIES: This category refers to activities of the home or family. This may include chores such as cleaning or yard work or errands for others at home (ex: taking care of children). ()	
RECREATION: Hobbies, sports or other activities done for fun. ()	
SOCIAL ACTIVITY: Spending time with friends and acquaintances other than family members. Can be dinners, going to the movies or meetings. ()	
OCCUPATION: Activities done as part of a job. Can be non-paying such as homemaker or volunteer. ()	
SEXUAL BEHAVIOR: Frequency and quality of your sex life. ()	
SELF-CARE: Personal maintenance of and independent living (ex: showers, getting dressed, driving). ()	
LIFE SUPPORT: Eating, breathing, and sleeping. ()	

End of Block: Pain Disability Index

Start of Block: Pain Coping Part 1

Q4 The following statements are about what people do or think when they are in pain.

Please indicate how often you act or think as described in the statements below.

	Hardly Ever (1)	Sometimes (2)	Often (3)	Very Often (4)
I quit my activities. (1)	○	○	○	○
I continue my activities, but with less effort. (2)	○	○	○	○
I continue my activities, but in a slower pace. (3)	○	○	○	○
I continue my activities, but less precise. (4)	○	○	○	○
I limit myself to simple activities. (5)	○	○	○	○
I take care that I don't have to exert myself physically. (6)	○	○	○	○
I take rest by sitting or laying down. (7)	○	○	○	○
I take on a comfortable bodily posture. (8)	○	○	○	○

End of Block: Pain Coping Part 1

Start of Block: Coping Part 2

Q5 The following statements are about what people do or think when they are in pain.

Please indicate how often you act or think as described in the statements below.

	Hardly Ever (1)	Sometimes (2)	Often (3)	Very Often (4)
I take a bath or shower. (1)	○	○	○	○
I take care that I don't get upset. (2)	○	○	○	○
I retreat to a restful environment. (3)	○	○	○	○
I take care that I am not bothered by annoying sounds. (4)	○	○	○	○
I take care that I am not bothered by light (ex. by putting on sunglasses or closing curtains). (5)	○	○	○	○
I take care of what I eat or drink. (6)	○	○	○	○
I pretend the pain is not present. (7)	○	○	○	○
I pretend the pain does not concern my body. (8)	○	○	○	○
I focus on the pain all the time. (9)	○	○	○	○

End of Block: Coping Part 2

Start of Block: Pain Coping Part 3

Q6 The following statements are about what people do or think when they are in pain.

Please indicate how often you act or think as described in the statements below.

	Hardly Ever (1)	Sometimes (2)	Often (3)	Very Often (4)
I pretend the pain does not concern my body. (1)	○	○	○	○
I focus on the pain all the time. (2)	○	○	○	○
I imagine the pain less violent than it really is. (3)	○	○	○	○
I think of pleasant things or events. (4)	○	○	○	○
I distract myself by undertaking a physical activity (ex.walking, cycling or swimming). (5)	○	○	○	○
I distract myself by reading, listening to music, watching a tv-program or something like it. (6)	○	○	○	○
I do something I find pleasant. (7)	○	○	○	○
I self-administer other physical stimuli (ex: by clenching my fists, pinching myself or rubbing on the site of pain). (8)	○	○	○	○
I think of all the things that remain undone because I am in pain. (9)	○	○	○	○

End of Block: Pain Coping Part 3

Start of Block: Pain Coping Part 4

Q7 The following statements are about what people do or think when they are in pain.

Please indicate how often you act or think as described in the statements below.

	Hardly Ever (1)	Sometimes (2)	Often (3)	Very Often (4)
I start worrying. (1)	○	○	○	○
I wonder about the cause of the pain. (2)	○	○	○	○
I think that the pain will worsen. (3)	○	○	○	○
I think of moments when I was not in pain. (4)	○	○	○	○
I think I go mad with pain. (5)	○	○	○	○
I remember other people's difficulties. (6)	○	○	○	○
I think that others do not understand what it is to be in such pain. (7)	○	○	○	○
I separate myself. (8)	○	○	○	○
When I am outdoors I try to return home as soon as possible. (9)	○	○	○	○

End of Block: Pain Coping Part 4

Start of Block: Social Support

Q2 Here is a list of some things that other people do for us or give us that may be helpful or supportive. Please read each statement carefully and select the option that describes you best.

	As much as I would like (1)	Almost as much as I would like (2)	Some, but would like more (3)	Less than I would like (4)	Much less than I would like (5)
I have people who care what happens to me. (1)	○	○	○	○	○
I get love and affection. (2)	○	○	○	○	○
I get chances to talk to someone about problems at work or with my housework. (3)	○	○	○	○	○
I get chances to talk to someone I trust about my personal or family problems. (4)	○	○	○	○	○
I get chances to talk about money matters. (5)	○	○	○	○	○
I get invitations to go out and do things with other people. (6)	○	○	○	○	○
I get useful advice about important things in life. (7)	○	○	○	○	○
I get help when I am sick in bed. (8)	○	○	○	○	○

End of Block: Social Support

Start of Block: BDI-II

Q8 Please read each of the following statements and select the one that describes how you have been feeling during the past 2 weeks, including today.

Q9 Sadness

- I do not feel sad. (1)
- I feel sad much of the time. (2)
- I am sad all the time. (3)
- I am so sad or unhappy that I can't stand it. (4)

Q10 Pessimism

- I am not discouraged about my future. (1)
- I feel more discouraged about my future. (2)
- I do not expect things to work out for me. (3)
- I feel my future is hopeless and will only get worse. (4)

Q11 Past Failure

- I do not feel like a failure. (1)
- I have failed more than I should have. (2)
- As I look back, I see a lot of failures. (3)
- I feel I am a total failure as a person. (4)

Q12 Loss of Pleasure

- I get as much pleasure as I ever did from the things I enjoy. (1)
- I don't enjoy things as much as I used to. (2)
- I get very little pleasure from the things I used to enjoy. (3)
- I can't get any pleasure from the things I used to enjoy. (4)

Q13 Guilty Feelings

- I don't feel particularly guilty. (1)
- I feel guilty over many things I have done or should have done. (2)
- I feel quite guilty most of the time. (3)
- I feel guilty all of the time. (4)

Q14 Punishment Feelings

- I don't feel I am being punished. (1)
- I feel I may be punished. (2)
- I expect to be punished. (3)
- I feel I am being punished. (4)

Q15 Self-Dislike

- I feel the same about myself as ever. (1)
- I have lost confidence in myself. (2)
- I am disappointed in myself. (3)
- I dislike myself. (4)

Q16 Self-Criticalness

- I don't criticize or blame myself more than usual. (1)
- I am more critical of myself than I used to be. (2)
- I criticize myself for all my faults. (3)
- I blame myself for everything bad that happens. (4)

Q17 Suicidal Thoughts or Wishes

- I don't have any thoughts of killing myself. (1)
- I have thoughts of killing myself, but I would not carry them out. (2)
- I would like to kill myself. (3)
- I would kill myself if I had the chance (4)

Q21 Crying

- I don't cry anymore than I used to. (1)
- I cry more than I used to. (2)
- I cry over every little thing. (3)
- I feel like crying, but I can't. (4)

End of Block: BDI-II

Start of Block: BDI-2

Q19 Please read each of the following statements and select the one that describes how you have been feeling during the past 2 weeks, including today.

Q20 Agitation

- I am no more restless or wound up than usual. (1)
- I feel more restless or wound up than usual. (2)
- I am so restless or agitated that it's hard to stay still. (3)
- I am so restless or agitated that I have to keep moving or doing something. (4)

Q22 Loss of Interest

- I have not lost interest in other people or activities. (1)
- I am less interested in other people or things than before. (2)
- I have lost most of my interest in other people or things. (3)
- It's hard to get interested in anything. (4)

Q23 Indecisiveness

- I make decisions about as well as ever. (1)
- I find it more difficult to make decisions than usual. (2)
- I have much greater difficulty in making decisions than I used to. (3)
- I have trouble making any decisions. (4)

Q24 Worthlessness

- I do not feel I am worthless. (1)
- I don't consider myself as worthwhile and useful as I used to. (2)
- I feel more worthless as compared to other people. (3)
- I feel utterly worthless. (4)

Q25 Loss of Energy

- I have as much energy as ever. (1)
- I have less energy than I used to have. (2)
- I don't have enough energy to do very much. (3)
- I don't have enough energy to do anything. (4)

Q26 Changes in Sleeping Pattern

- I have not experienced any change in my sleeping pattern. (1)
- I sleep somewhat more than usual. (2)
- I sleep somewhat less than usual. (3)
- I sleep a lot more than usual. (4)
- I sleep a lot less than usual. (5)
- I sleep most of the day. (6)
- I wake up 1-2 hours early and can't get back to sleep. (7)

Q27 Irritability

- I am no more irritable than usual. (1)
- I am more irritable than usual. (2)
- I am much more irritable than usual. (3)
- I am irritable all the time. (4)

Q28 Changes in Appetite

- I have not experienced any change in my appetite. (1)
- My appetite is somewhat less than usual. (2)
- My appetite is somewhat greater than usual. (3)
- My appetite is much less than before. (4)
- My appetite is much greater than usual. (5)
- I have no appetite at all. (6)
- I crave food all the time. (7)

Q29 Concentration Difficulty

- I can concentrate as well as ever. (1)
- I can't concentrate as well as usual. (2)
- It's hard to keep my mind on anything for very long. (3)
- I find I can't concentrate on anything. (4)

Q30 Tiredness or Fatigue

- I am no more tired or fatigued than usual. (1)
- I get more tired or fatigued more easily than usual. (2)
- I am too tired or fatigued to do a lot of the things I used to do. (3)
- I am too tired or fatigued to do most of the things I sued to do. (4)

Q31 Loss of Interest in Sex

- I have not noticed any recent change in my interest in sex. (1)
- I am less interested in sex than I used to be. (2)
- I am much less interested in sex now. (3)
- I have lost interest in sex completely. (4)

End of Block: BDI-2

Start of Block: Beck Anxiety Inventory

Q95 Below is a list of common symptoms of anxiety. Please indicate how much you have been bothered by that symptom during the past month, and including today.

	Not At All (1)	Mildly, but it didn't bother me much (2)	Moderately-it wasn't pleasant at times (3)	Severely-it bothered me a lot (4)
Numbness or tingling (1)	○	○	○	○
Feeling hot (2)	○	○	○	○
Wobbliness in legs (3)	○	○	○	○
Unable to relax (4)	○	○	○	○
Fear of worst happening (5)	○	○	○	○
Dizzy or lightheaded (6)	○	○	○	○
Heart pounding/racing (7)	○	○	○	○
Unsteady (8)	○	○	○	○
Terrified or afraid (9)	○	○	○	○
Nervous (10)	○	○	○	○
Feeling of choking (11)	○	○	○	○
Hands trembling (12)	○	○	○	○
Shaking (13)	○	○	○	○

Fear of losing control (14)	○	○	○	○
Difficulty in breathing (15)	○	○	○	○
Fear of Dying (16)	○	○	○	○
Scared (17)	○	○	○	○
Indigestion (18)	○	○	○	○
Faint or Lightheaded (19)	○	○	○	○
Face Flushed (20)	○	○	○	○
Hot/cold sweats (21)	○	○	○	○

End of Block: Beck Anxiety Inventory

Start of Block: QOL

Q33 Please select the answer that best describes your feelings.

Q32 How would you rate your quality of life?

- Very Poor (1)
- Poor (2)
- Neither Poor nor Good (3)
- Good (4)
- Very Good (5)

Q34 How satisfied are you with your health?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

End of Block: QOL

Start of Block: QOL2

Q35 The following questions ask about how much you have experienced certain things in the last two weeks.

Q36 To what extent do you feel that physical pain prevents you from doing what you need to do?

- Not at All (1)
- A little (2)
- A Moderate Amount (3)
- Very Much (4)
- An Extreme Amount (5)

Q37 How much do you need any medical treatment to function in your daily life?

- Not at All (1)
- A little (2)
- A Moderate Amount (3)
- Very Much (4)
- An Extreme Amount (5)

Q38 How much do you enjoy life?

- Not at All (1)
- A little (2)
- A Moderate Amount (3)
- Very Much (4)
- An Extreme Amount (5)

Q39 To what extent do you feel your life to be meaningful?

- Not at All (1)
- A little (2)
- A Moderate Amount (3)
- Very Much (4)
- An Extreme Amount (5)

Q40 How well are you able to concentrate?

- Not at All (1)
- A little (2)
- A Moderate Amount (3)
- Very Much (4)
- An Extreme Amount (5)

Q41 How safe do you feel in your daily life?

- Not at All (1)
- A little (2)
- A Moderate Amount (3)
- Very Much (4)
- An Extreme Amount (5)

Q43 How healthy is your physical environment?

- Not at All (1)
- A little (2)
- A Moderate Amount (3)
- Very Much (4)
- An Extreme Amount (5)

End of Block: QOL2

Start of Block: QOL-3

Q44 The following questions ask about how completely you experience or were able to do certain things in the last two weeks.

Q45 Do you have enough energy for everyday life?

- Not at All (1)
- A Little (2)
- Moderately (3)
- Mostly (4)
- Completely (5)

Q46 Are you able to accept your bodily appearance?

- Not at All (1)
- A Little (2)
- Moderately (3)
- Mostly (4)
- Completely (5)

Q47 Do you have enough money to meet your needs?

- Not at All (1)
- A Little (2)
- Moderately (3)
- Mostly (4)
- Completely (5)

Q48 How available to you is the information that you need in your day-to-day life?

- Not at All (1)
- A Little (2)
- Moderately (3)
- Mostly (4)
- Completely (5)

Q49 To what extent do you have the opportunity for leisure activities?

- Not at All (1)
- A Little (2)
- Moderately (3)
- Mostly (4)
- Completely (5)

End of Block: QOL-3

Start of Block: QOL4

Q50 How well are you able to get around?

- Very Poor (1)
- Poor (2)
- Poor nor Good (3)
- Good (4)
- Very Good (5)

Q52 How often do you have negative feelings such as blue mood, despair, anxiety, or depression?

- Never (1)
- Seldom (2)
- Quite Often (3)
- Very Often (4)
- Always (5)

End of Block: QOL4

Start of Block: QOL5

Q51 How satisfied are you with your sleep?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

Q53 How satisfied are you with your ability to perform your daily living activities?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

Q54 How satisfied are you with your capacity for work?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

Q55 How satisfied are you with yourself?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

Q56 How satisfied are you with your personal relationships?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

Q57 How satisfied are you with your sex life?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

Q58 How satisfied are you with the support you get from your friends?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

Q59 How satisfied are you with the conditions of your living space?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

Q60 How satisfied are you with your access to health service?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

Q61 How satisfied are you with your means of transportation?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

Q53 How satisfied are you with your ability to perform your daily living activities?

- Very Dissatisfied (1)
- Dissatisfied (2)
- Neither Satisfied nor Dissatisfied (3)
- Satisfied (4)
- Very Satisfied (5)

End of Block: QOL5

Start of Block: Ethnic Discrimination

Q89 Because of your ethnicity or race, how often have the following happened?

How often...

	Never		Sometimes		Very Often
	1	2	3	4	5

Have you been treated unfairly by teachers, principals, or other staff at school? ()	
Have other thought you couldn't do things or handle a job? ()	
Have others threatened to hurt you? ()	
Have others actually hurt you or tried to hurt you? ()	
Have policemen or security officers been unfair to you? ()	
Have others threatened to damage your property? ()	
Have others actually damaged your property? ()	
Have others made you feel like an outsider who doesn't fit in because of your dress, speech, or other characteristics related to your ethnicity? ()	
Have you been treated unfairly by coworkers or classmates? ()	

Q91 Because of your ethnicity or race, how often have the following happened?

How often...

	Never		Sometimes		Very Often
	1	2	3	4	5

Have others hinted that you are dishonest or can't be trusted? ()	
Have people been nice to you to your face, but said bad things about you behind your back? ()	
Have people who speak a different language made you feel like an outsider? ()	
Have others ignored you or not paid attention to you? ()	
Has you boss or supervisor been unfair to you? ()	
Have others hinted that you must not be clean? ()	
Have people not trusted you? ()	
Has it been hinted that you must be lazy? ()	

End of Block: Ethnic Discrimination